

Pipe Hangers & Supports

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MAY 2019

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ANVIL[®]
INTERNATIONAL
Building Connections That Last

BUILDING CONNECTIONS THAT LAST



For over 160 years, Anvil has worked diligently to build a strong, vibrant tradition of making connections — pipe to pipe and people to people.

We pride ourselves in providing the finest-quality pipe products and services with integrity and dedication to superior customer service at all levels.

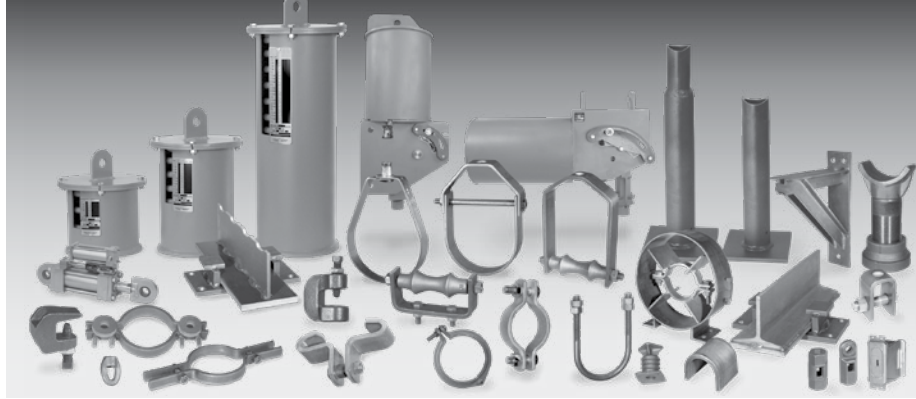
We provide expertise and product solutions for a wide range of applications, from plumbing, mechanical, HVAC, industrial and fire protection to mining, oil and gas. Our comprehensive line of products includes: grooved pipe couplings, grooved and plain-end fittings, valves, cast and malleable iron fittings, forged steel fittings, steel pipe nipples and couplings, pipe hangers and supports, channel and strut fittings, mining and oil field fittings, along with much more.

As an additional benefit to our customers, Anvil offers a complete and comprehensive Design Services Analysis for mechanical equipment rooms, to help you determine the most effective and cost-efficient piping solutions.

Anvil is a proud member of the United States Green Building Council (USGBC). Go to the Anvil website to obtain manufacturer recycled certificates and other Green information.

At Anvil, we believe that responsive and accessible customer support is what makes the difference between simply delivering products — and delivering solutions.

Pipe Hangers and Supports



Manufacturing Excellence

Anvil Pipe Hangers and Supports are manufactured in three primary U.S. locations: North Kingstown, Rhode Island; Henderson, Tennessee and Columbia, Pennsylvania, each with its own unique capabilities.

At 150,000 square feet, our Pipe Support design and fabrication facility in North Kingstown, Rhode Island is the industry leader in the Engineered Hanger Market for experience and in house manufacturing capability. Our equipment can accommodate any project since we have the capability to machine, saw and flame cut up to 3" thick carbon and alloy steel and plasma cut stainless steel.

We thread rod through 4" in diameter and we hot form small to large diameter clamps. Our facility also has complete in house blasting and painting capability and we perform complete in house Non-Destructive Examination including Liquid Penetrant, Ultrasonic and Magnetic Particle examination. This expertise is supported by our total quality programs including our ASME "NPT" Nuclear Certificate of Authorization, "NS" Certificate of Authorization and, ISO 9001.

Our manufacturing facility in Henderson, Tennessee has over 175,000 square feet of manufacturing capability dedicated to producing a complete line of commercial, light industrial and industrial Pipe Hangers and Supports. These include clamps, braces, inserts, rods and attachments, slides and guides to exacting industry standards and certified to ISO 9001 quality. The products manufactured in Henderson are designed for use in a wide variety of rigid Pipe Hanger or Support applications, in markets including fire protection, electrical, water and waste water treatment, petrochemical, seismic, industrial and commercial. Special fabrication is available from our Henderson facility as well.

At our Columbia, Pennsylvania Foundry, where we manufacture malleable fittings, cast iron fittings and our Gruvlok® products, we also manufacture our malleable and ductile iron Hanger Products such as beam clamps, numerous types of pipe clamps, concrete inserts, ceiling flanges and different types of rod attachments. With over 600,000 square feet of manufacturing floor space under roof, our foundry has an annual pouring capacity of 100,000 tons. Columbia is ISO 9001 certified and is a quality manufacturer of malleable, ductile and cast iron products. In addition to these three facilities Anvil also has Hanger fabrication facilities in Houston, Texas to service the Gulf Coast Engineered Hanger requirements.

Customer Service

With four key stocking locations throughout North America, you can count on getting all of the product you need - when you need it. When you have installation questions our solid customer service personnel are there to answer all of your questions, backed by our designers or engineers we are there for you - on site if needed.

Custom Engineering Options

In addition to its full range of high-quality hangers, Anvil offers a number of custom options to meet any special project requirements you may have.

Engineered Hangers Product Line

- Variable Springs
- Constant Supports
- Hydraulic Snubbers
- Vibration Sway Braces
- Sway Struts

We also provide:

- Special Fabrication/
Miscellaneous Structural/
Steel Fabrication
- Special Design Products Per
Customer Specifications
- Domestic Manufactured
Product Line

Design Services

Either on or off-site, Anvil Design Services helps you maximize the efficiency of your pipe support systems.

These services include:

- Pipe Hanger Design &
Engineering
- Computer-Aided Drafting
- System Analysis
- Pipe Stress Analysis
- Product Qualification Testing
(environmental static and
cycling loads, flow and leak)
- Field Services
- Supervision of Client Design
Personnel
- Non-destructive Examination

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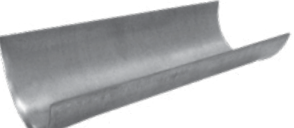
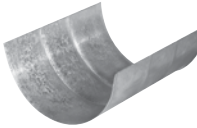
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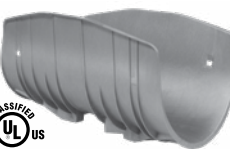



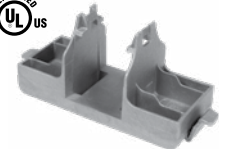

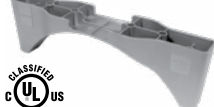





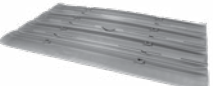
Rod load ratings shown in this catalog are based upon MSS-SP-58 (2002 and later).

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CLEVIS HANGERS AND SHIELDS










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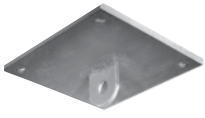
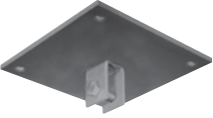

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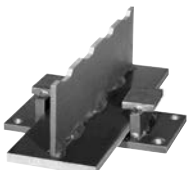


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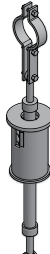
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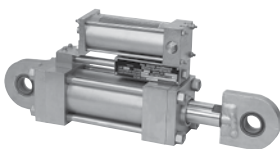



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|--|--|--|---|--|
|  <p>Fig. AF090 (Anvil Fig. 89X & Afcon Fig. 160) Restraining Strap Size Range: $\frac{3}{8}$" thru $\frac{3}{4}$" Threaded Rod Page 272</p> |  <p>Fig. AF090R (Afcon Fig. 162) Retrofit Restraint Strap Size Range: $\frac{3}{8}$" and $\frac{1}{2}$" Threaded Rod Page 273</p> |  <p>Fig. AF310 (Afcon Fig. 310) Surge Restraint Size Range: 1" thru 2" Fig. 69, Swivel Ring Hanger Page 274</p> |  <p>Fig. AF773 (Anvil Fig. 773) Surge Restraint Size Range: $\frac{3}{4}$" thru 2" Fig. 69, Swivel Ring Hanger Page 275</p> |  <p>Fig. AF777 (Anvil Fig. 777 & Afcon Fig. 615) Swivel Attachment Size Range: $\frac{3}{8}$" and $\frac{1}{2}$" Rod Page 276</p> |
|--|--|--|---|--|

GENERAL NOTES

Standard Materials

Anvil catalog items are made from the following materials.

| Hanger Classification | Material | Material Specifications (ASTM) |
|--|--|--|
| Beam Clamps | Malleable Iron | A197 |
| | Ductile Iron | A536-77 Grade 65-45-12 |
| | Carbon Steel - Stamped | A36 or A1011, CS, Type A, B, or C |
| | Carbon Steel- Formed | A575 Grade M1020 |
| | Forged Steel | A668 or A1030 |
| Bolts, Nuts, Pins and U-Bolts | Carbon Steel - Rod | A36 or AISI 1006-1015 |
| | Carbon Steel - Bolts | A307 |
| | Carbon Steel- Nuts | A563 |
| Brackets | Malleable Iron | A197 |
| | Carbon Steel - Pre Galv. | A653 |
| | Carbon Steel - Structural Shapes and Plate | A36 |
| Ceiling Plates and Flanges | Plastic | N/A |
| | Malleable Iron | A197 |
| Clevis Hangers | Cast Iron | A48 Grade 20 or A126 |
| Clevis Hangers - Pipe or Conduit | Carbon Steel - Stamped | A1011, CS, Type A, B or C |
| Clevis Hangers - Ductile Iron Pipe | Carbon Steel | A569 Grade 1008-1010 or A525 or A526 |
| Concrete Inserts and Attachments | Carbon Steel | A36, A569 |
| | Malleable Iron | A197 |
| | Carbon Steel - Stamped | A1011 |
| Copper Tubing Hangers | Carbon Steel - Formed and Fabricated | A36 or A515 Grade 65-70 |
| | Malleable Iron | A197 |
| Copper Tubing Hangers - Pipe Ring | Carbon Steel | A1011, CS, Type A, B or C |
| CPVC Hangers | Carbon Steel | A653 |
| Hanger Rods | Carbon Steel | A1011, CS, Type B |
| Pipe Alingment Guides | Carbon Steel | A36 or A1006-1015 |
| Pipe Slides | Carbon Steel | A36 or A1011, CS, Type A, B, or C |
| Pipe Rings | Carbon Steel - Structural Shapes or Plates | A36 |
| | Malleable Iron | A197 |
| Pipe Roll - (2) Rod, Yoke & Chair | Carbon Steel | A653 |
| Pipe Roll - Stands | Cast Iron | A1010 or A1015 |
| Pipe Protection Saddles | Cast Iron | A48 Gr 20 or A126 |
| Pipe Shields | Carbon Steel | A36 or A1011, CS, Type A, B, or C |
| | Alloy Steel | A387 Grade 22 Class 1 Annealed |
| Pipe Supports - Stanchions | Carbon Steel | A653 |
| Pipe Supports - Saddles | Carbon Steel | Tube: A513 Grade 1020 or 1026, Plate:A36 |
| | Cast Iron | A36 |
| Rod Attachments | Cast Iron | A48 Grade 20 or A126 |
| | Malleable Iron | A197 |
| | Carbon Steel | A36 |
| Rod Attachments - Rod Couplings | Carbon Steel | A36 |
| Socket Clamps | Forged Steel | A668 or A1030 |
| Socket Clamps- Washers | Carbon Steel | A307 or A563 |
| | Cast Iron | A36 |
| Stainless Steel Hangers and Supports | Carbon Steel | A126 |
| Plate | Carbon Steel | A36 |
| Pipe | Refer to table note 1. | |
| Rod and Pins | Stainless Steel | A240 Type 304 |
| Bolts | Stainless Steel | A312 Type 304 |
| | Stainless Steel | A276 Type 304 |
| Nuts | Stainless Steel | 18-8 Stainless |
| Steel Pipe Clamps- Offset and Extended | Stainless Steel | 18-8 Stainless |
| | Carbon Steel | A36 or A570 Grade C/D or AISI 1020 |
| Steel Pipe Clamps | Carbon Steel - Stamped | A36 or A1011, CS, Type A, B, or C |
| | Carbon Steel - Formed | A36 or A515 Grade 65-70 |
| | Chrome Molybdenum Steel | A387 Grade 22 |
| Straps | Malleable Iron | A197 |
| | Carbon Steel - Formed | A36 |
| | Carbon Steel - Stamped | A1011, CS, Type A, B, or C |
| Structural Attachments - Washer Plates | Carbon Steel | A36 or AISI 1020 or A515 Grade 65-70 |
| Structural Attachments | Carbon Steel | A36 or A515 Grade 65-70 |
| | Malleable / Ductile | A197, A536-77 Grade 65-45-12 |
| Trapeze | Carbon Steel - Structural Shapes | A36 |
| | Carbon Steel - HSS | A500 Grade B or C |

- Notes: 1. Most Anvil hanger figure numbers are available in stainless steel on special order, primarily in type 304 and type 316. Items are limited.
 2. Custom fabricated products can be furnished - to specifications provided by customer.
 3. Standard material specifications are subject to change without notice.

Standard Galvanizing Practice

Anvil offers 3 basic forms for zinc coating on its hanger components

- 1) **Electro-Plated Zinc (Electro-galvanized)**
- 2) **Pre-Galvanized Zinc**
- 3) **Hot Dipped Galvanized (ASTM A123 or ASTM A153)**

Note: The corrosion resistance of zinc is based on its thickness, the environment and the coating process used.

Electro-Plated Zinc (ASTM B633)

This type of coating is recommended for use indoors in relatively dry areas. The steel is submerged in a bath of zinc salts, through the process of electrolysis, a coating of pure zinc adheres to the steel with a molecular bond. A maximum of .5 mills of zinc can be applied using this method. The threaded components and fasteners for Anvil hangers are furnished electro-plated.

Pre-Galvanized Zinc (ASTM A653)

This type of coating is suitable for extended exposure in dry or mildly corrosive atmospheres, but not generally recommended for use outdoors in industrial environments. Also known as "mill galvanized" or "hot-dipped mill galvanized", pre-galvanized zinc coatings are produced by rolling the steel coils or sheets through molten zinc at the steel mill. The material is then cut or slit to size. Coating thickness is .90 ounces per square foot of steel surface. Zinc near the uncoated edges or weld areas becomes a sacrificial anode which protects the bare areas. Anvil uses this type of material on our Fig. 167 shields and Fig. 69 swivel ring hangers.

Hot-Dip Galvanized (ASTM A123 or ASTM A153)

Recommended for prolonged outdoor exposure and will usually protect steel in most atmospheric environments. After fabrication, the part is immersed in a bath of molten zinc. A metallurgical bond is formed, resulting in a zinc coating that coats all surfaces including edges. Anvil's standard galvanizing practice for our Fig. 261 riser clamps and Fig. 212 medium pipe clamps is hot-dip galvanized.

| Figure Number | Description | Standard Galvanize Finish |
|---------------|---|---|
| 14 | Adj. Side Beam Clamp | EG |
| 40 | Riser Clamp – Standard | Hot Dip with EG Fasteners |
| 45 | Channel Assembly | Hot Dip |
| 46 | Universal Trapeze Assembly | Hot Dip |
| 47 | Concrete Single Lug Plate | Hot Dip |
| 49 | Concrete Clevis Plate | Hot Dip with EG Fasteners |
| 50 | Equal Leg Angle for Trapeze Assembly | Hot Dip |
| 52 | Concrete Rod Attachment Plate | Hot Dip |
| 54 | Two Hole Welding Beam Lug | Hot Dip |
| 55 | Structural Welding Lug | Hot Dip |
| 60 | Steel Washer Plate | Hot Dip |
| 62 | Pipe Stanchion | Hot Dip |
| 63 | Pipe Stanchion | Hot Dip |
| 65 | Light Duty Adj. Clevis | EG |
| 66 | Welded Beam Attachment | Hot Dip |
| 66 with BN | Welded Beam Attachment | Hot Dip with EG Fasteners |
| 67 | Pipe or Conduit Hanger | EG |
| 69 | Adj. Swivel Ring, Tapped per NFPA Standards | Strap is Pre-Galv. Material, Nut is EG (See Note 1) |
| 76 | Fabricated Roller for Large Dia. Pipe | Galvanizing not possible, Paint Only |

| Figure Number | Description | Standard Galvanize Finish |
|---------------|---------------------------------------|---------------------------|
| 86 | C-Clamp with Set Screw & Lock Nut | EG |
| 88 | C-Clamp with Set Screw | EG |
| 89, 89X | Retaining Clip | EG |
| 92 | Universal C-Type Clamp (Std. Throat) | EG |
| 93 | Universal C-Type Clamp (Wide Throat) | EG |
| 94 | Wide Throat Beam C-Clamp | EG |
| 95 | C-Clamp with Lock Nut | EG |
| 100 | Extended Pipe Clamp | Hot Dip with EG Fasteners |
| 103 | Offset Pipe Clamp | Hot Dip with EG Fasteners |
| 104 | Adj. Swivel Ring, Split Ring Type | EG |
| 120 | Light Weight U-Bolt | EG |
| 126 | One-Hole Clamp | EG |
| 128R | Rod Threaded Ceiling Flange | EG |
| 133 | Standard Duty Beam Clamp | Hot Dip with EG Fasteners |
| 134 | Heavy Duty Beam Clamp | Hot Dip with EG Fasteners |
| 135E | Rod Coupling Straight less Sight Hole | EG |
| 135R | Rod Coupling Reducing | EG |
| 136 | Rod Coupling Straight | EG |
| 136R | Rod Coupling Reducing | EG |
| 137 | Standard U-Bolt | EG |
| 137S | Special U-Bolt (non-standard) | Hot Dip |

EG = Zinc Electro Plate ASTM B633 Hot Dip = ASTM A123 or A153 Pre-Galv. = ASTM A653
 Most EG items and fasteners can be hot dip galvanized except as indicated. Hot Dipped galvanized all thread rod is available.
 Note 1 indicates that hot dip fasteners are not available.

GENERAL NOTES

Standard Galvanizing Practice (cont.)

| Figure Number | Description | Standard Galvanize Finish |
|-----------------|---|--|
| 138R | Ext. Split Pipe Clamp (Rod Threaded) | EG |
| 140 | Machine Threaded Rod (RH Threads) | EG |
| 142 | Coach Screw Rod | EG |
| 146 | Continuous Threaded Rod | EG |
| 148 | Rod with Eye End | EG |
| 157 | Extension Piece | EG |
| 167 | Insulated Protection Shield | Pre-Galv. Material |
| 168 | Rib-Lok Shield | Pre-Galv. Material |
| 171 | Single Pipe Roll | EG |
| 175 | Roller Chair | Chair-Hot Dip, All Other EG |
| 177 | Adj. Pipe Roll Support | EG |
| 178 | Spring Cushion Hanger | Can Galv. Retainer, Springs Paint Only |
| 181 | Adj. Steel Yoke Pipe Roll | Hot Dip Yoke, All Other EG |
| 185 | One Hole Pipe Strap | EG |
| 186 | Two Hole Pipe Strap | EG |
| 187 | Two Hole 90° Side Mount Strap | EG |
| 188 | Two Hole Stand Off Strap | EG |
| 189 | Straight Eye Socket | Pre-Galv. |
| 190 | Off-Set Eye Socket | Pre-Galv. |
| 191 | Adj. Pipe Saddle with U-Bolt | EG |
| 192 | Adj. Pipe Saddle | EG |
| 194 | Light Welded Steel Bracket | Hot Dip |
| 195 | Medium Welded Steel Bracket | Hot Dip |
| 199 | Heavy Welded Steel Bracket | Hot Dip |
| 206 | Steel Side Beam Bracket | EG |
| 207 | Threaded Steel Side Beam Bracket | EG |
| 212 | Medium Pipe Clamp | Hot Dip with EG Bolts & Nuts |
| 212FP | Earthquake Bracing Clamp | Hot Dip with EG Bolts & Nuts |
| 216 | Heavy Pipe Clamp | Hot Dip with EG Bolts & Nuts |
| 218 | Malleable Beam Clamp without Ext. Piece | EG |
| 228 | Universal Forged Steel Beam Clamp | EG |
| 230 | Turnbuckle | EG |
| 233 | Turnbuckle | EG |
| 248, 248L, 248X | Eye Rod Not Welded | EG |
| 253 | Machine Threaded Rod (Threaded Both Ends) | EG |
| 255 | Pipe Alignment Guide | Hot Dip with EG Bolts & Nuts |
| CT-255 | Copper Tubing Alignment Guide | Housing: Hot Dip with EG Bolts & Nuts Spider Clamp: Copper Plated |
| 256 | Pipe Alignment Guide | Hot Dip with EG Bolts & Nuts |
| 257 | Structural Tee Slide | Hot Dip, Weld after Galv. & Cold Spray Touch-up |
| 258 | Pipe Saddle Support | EG |
| 259 | Pipe Saddle Support with U-Bolt | EG |
| 260 | Adj. Clevis Hanger | 8" & Smaller: EG 10" & Larger: Hot Dip with EG Bolts & Nuts |
| 260 ISS | Clevis Hanger with Insulation Saddle System | Reference Fig. 260 |

| Figure Number | Description | Standard Galvanize Finish |
|-----------------|---|--|
| 261 | Ext. Pipe or Riser Clamp | Hot Dip with EG Bolts & Nuts |
| 262 | Strap Short | EG |
| 264 | Adj. Pipe Saddle Support | EG (See Note 1) Nippel red. assembly cannot be hot dipped. |
| 265 | Adj. Pipe Saddle Support with U-Bolt | EG (See Note 1) Nippel red. assembly cannot be hot dipped. |
| 271 | Pipe Roll Stand | EG |
| 274 | Adj. Pipe Roll Stand with Base Plate | EG |
| 274P | Pipe Roll Stand - Base Plate Only | EG |
| 275 | Adj. Pipe Roll Stand without Base Plate | EG |
| 277 | Pipe Roll and Base Plate | EG |
| 278, 278L, 278X | Eye Rod Welded | EG |
| 281 | Wedge Type Concrete Insert | EG (See Note 1) |
| 282 | Universal Concrete Insert | EG (See Note 1) |
| 285 | Light Weight Concrete Insert | EG (See Note 1) |
| 290, 290L | Weldless Eye Nut | EG |
| 291 | Clevis Pin with Cotters | EG |
| 292, 292L | Universal Forged Steel Beam Clamp | EG |
| 295 | Double Bolt Pipe Clamp | Hot Dip with EG Bolts & Nuts |
| 295A | Alloy Double Bolt Pipe Clamp | Alloy Material, Galv. is not Recommended |
| 295H | Heavy Duty Double Bolt Pipe Clamp | Hot Dip with EG Bolts & Nuts |
| 299 | Forged Steel Clevis | EG |
| 300 | Adj. Clevis for Insulated Lines | 8" & Smaller: EG 10" & Larger: Hot Dip with EG Bolts & Nuts |
| 395 | Cast Iron Ceiling Plate | EG |
| 432 | Special Clamp | Hot Dip with EG Bolts & Nuts |
| 436 | Fabricated Tee Slide Assembly | Hot Dip, Weld after Galv. & Cold Spray Touch-up |
| 439 | Structural "H" Slide Assembly | Hot Dip, Weld after Galv. & Cold Spray Touch-up |
| 590 | Adj. Clevis for Ductile or Cast Iron Pipe | Hot Dip with EG Bolts & Nuts |
| 594 | Socket Clamp Washer | EG |
| 595 | Socket Clamp for Ductile Iron or Cast Iron Pipe | Hot Dip with EG Bolts & Nuts |
| 599 | Socket Clamp Washer | EG |
| 600 | Socket Clamp for Ductile Iron or Cast Iron Pipe | Hot Dip with EG Bolts & Nuts |
| 770 | Q-Brace Clamp | EG (See Note 2) |
| 771 | Sway Brace Swivel Attachment | EG |
| 772 | Adj. Steel Beam Attachment | EG |
| 773 | Surge Restrainer | EG |
| 775 | Lateral/Longitudinal Brace Clamp | EG |
| 776 | Brace Clamp | EG |
| 777 | Swivel Joint Connector | EG |
| 778 | Bar Joist and Beam Attachment | EG |
| 779 | Multi-Connector Adapter | EG |

EG = Zinc Electro Plate ASTM B633 Hot Dip = ASTM A123 or A153 Pre-Galv. = ASTM A653
 Most EG items and fasteners can be hot dip galvanized except as indicated. Hot Dipped galvanized all thread rod is available.
 Note 1 indicates that hot dip fasteners are not available.

Fig. 65 (Formerly Afcon Fig. 372)

Light Duty Adjustable Clevis

Size Range: 1/2" through 4"

Material: Carbon steel

Finish: Plain or Zinc Plated (Hot-Dip Galvanized optional)

Service: Recommended for suspension of **stationary** pipe or conduit.

Maximum Temperature: Plain 650° F, Galvanized and Epoxy 450° F

Approvals: Complies with Federal Specification WW-H-171-E (Type 12).

Installation: Hanger load nut above the clevis must be tightened securely to assure proper hanger performance.

Adjustment: Vertical adjustment is provided, varying with the size of clevis. Tighten upper nut after adjustment.

Features: An economical attachment for light duty service.

Ordering: Specify pipe size, figure number, name and finish.

Metric nut available upon request.

Caution: When an oversize clevis is used, a pipe spacer or multispacer should be placed over clevis bolt to ensure that the lower U-strap will not move in on the bolt.

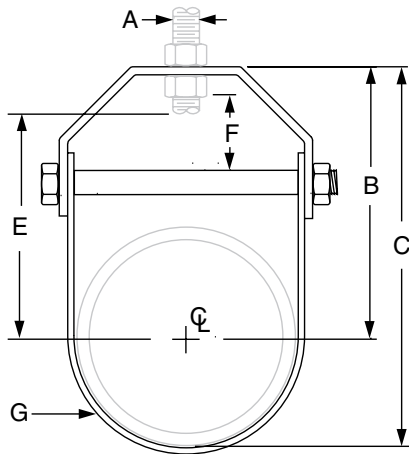


FIG. 65: DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS)

| Pipe Size | Max Load | Weight | Rod Size A | B | C | Rod Take Out E | Adjustment F | G Width Lower |
|-----------|----------|--------|------------|---------|---------|----------------|--------------|---------------|
| 1/2 | 150 | 0.10 | 3/8 | 1 11/16 | 2 3/32 | 1 1/4 | 7/16 | 5/8 |
| 3/4 | 250 | 0.17 | | 1 7/8 | 2 13/32 | 1 7/16 | 1/2 | 3/4 |
| 1 | | 0.18 | | 2 5/32 | 2 13/16 | 1 11/16 | 5/8 | |
| 1 1/4 | | 0.21 | | 2 17/32 | 3 3/8 | 2 1/16 | 13/16 | |
| 1 1/2 | | 0.24 | | 2 13/16 | 3 13/16 | 2 3/8 | 15/16 | |
| 2 | | 0.26 | | 3 11/32 | 4 17/32 | 2 7/8 | 1 3/16 | |
| 2 1/2 | 350 | 0.50 | | 3 27/32 | 5 9/32 | 3 1/4 | 1 5/16 | |
| 3 | | 0.59 | | 4 15/32 | 6 7/32 | 3 7/8 | 1 5/8 | |
| 3 1/2 | | 0.62 | | 4 31/32 | 6 31/32 | 4 3/8 | 1 7/8 | |
| 4 | 400 | 0.77 | | 5 17/32 | 7 25/32 | 4 15/16 | 2 1/8 | |

Fig. CT-65

Light Duty Adjustable Clevis

Size Range: 1/2" through 4"

Material: Carbon steel

Finish: Copper plated

Service: Recommended for suspension of non-insulated, **stationary** copper tube.

Approvals: Complies with Federal Specification WW-H-171-E (Type 12).

Installation:

- (1) Adjustment may be made either before or after tubing is in place without temporary support of pipe.
- (2) Hanger rod and nuts may be locked into position after adjustment by use of the upper nut.

Features: Provides for adjustment up to 1 7/8".

Ordering: Specify nominal tube size, figure number, name and finish

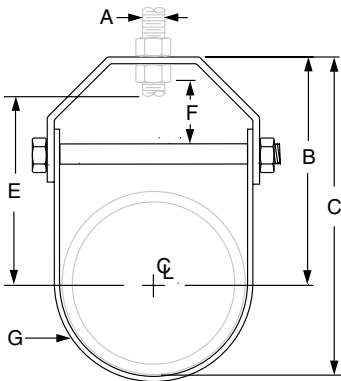


FIG. CT-65: DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS)

| Tube Size | Max Load | Weight | Rod Size A | B | C | D | Rod Take Out - E | Adjustment F | G Width Lower |
|-----------|----------|--------|------------|---------|---------|---------|------------------|--------------|---------------|
| 1/2 | 150 | 0.09 | 3/8 | 1 1/2 | 1 27/32 | 1 7/16 | 1 1/16 | 5/16 | 5/8 |
| 3/4 | | 0.10 | | 1 11/16 | 2 3/32 | 1 9/16 | 1 1/4 | 7/16 | 3/4 |
| 1 | 250 | 0.17 | | 1 7/8 | 2 13/32 | 1 5/8 | 1 7/16 | 1/2 | |
| 1 1/4 | | 0.18 | | 2 5/32 | 2 13/16 | 1 3/4 | 1 11/16 | 5/8 | |
| 1 1/2 | | 0.21 | | 2 17/32 | 3 3/8 | 1 15/16 | 2 1/16 | 13/16 | |
| 2 | | 0.26 | | 3 11/32 | 4 17/32 | 2 5/16 | 2 7/8 | 1 3/16 | |
| 2 1/2 | 350 | 0.48 | | 3 27/32 | 5 9/32 | 2 3/4 | 3 1/4 | 1 5/16 | |
| 3 | | 0.55 | | 4 15/32 | 6 7/32 | 3 | 3 7/8 | 1 5/8 | |
| 4 | 400 | 0.60 | 4 31/32 | 6 31/32 | 3 1/4 | 4 3/8 | 1 7/8 | | |

Note: 1) Reflects changes in rod diameter from previously published data per recent revisions in MSS-SP-58 & 69.

2) 3 1/2" tube size alternate - 3 1/2" Fig. 65 galvanized.

Fig. 67

Pipe or Conduit Hanger

Size Range: 1/2" through 6"

Material: Carbon steel

Finish: Zinc Plated (Hot-Dip Galvanized optional)

Service: Can be suspended by hanger rod or attached to wall. "T" slot in hanger permits side bolt to be installed after installation and setting of pipe.

Approvals: Complies with Federal Specification A-A-1192A (Type 5), ANSI/MSS SP-69 and MSS SP-58 (Type 5).

Components: Strap and bolt with nut – assembled.

Ordering: Specify pipe size, figure number and name.

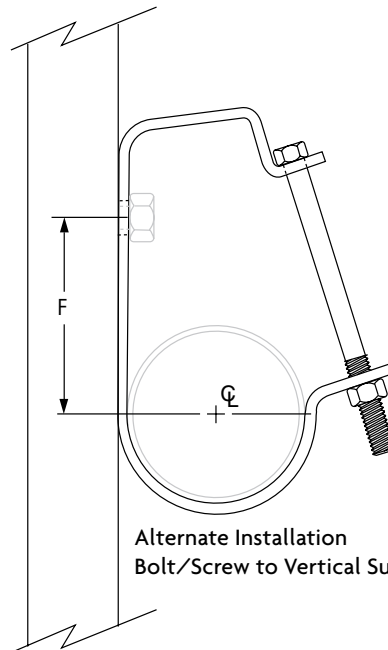
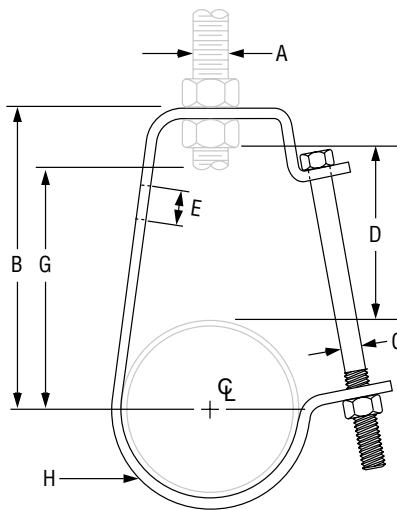


FIG. 67: DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS)

| Pipe Size | Load Rating | Weight | Rod Size A | B | C | D | E | F | G | H Width |
|-------------------------------|-------------|--------|------------|-------------------------------|-----|---------------------------------|------|-------------------------------|---------------------------------|-------------------------------|
| 1/2 | 400 | 0.21 | 3/8 | 2 ⁵ / ₈ | 1/4 | 1 ³ / ₄ | 7/16 | 1 ³ / ₄ | 1 ¹⁵ / ₁₆ | 1 |
| 3/4 | | 0.22 | | 2 ⁷ / ₈ | | 1 ⁷ / ₈ | | 2 | 2 ¹ / ₈ | |
| 1 | | 0.25 | | 3 | | 1 ¹⁵ / ₁₆ | | 2 ¹ / ₈ | 2 ⁵ / ₁₆ | |
| 1 ¹ / ₄ | | 0.27 | | 3 ¹ / ₄ | | 2 | | 2 ¹ / ₄ | 2 ⁵ / ₈ | |
| 1 ¹ / ₂ | | 0.29 | | 3 ¹ / ₂ | | 2 ³ / ₁₆ | | 2 ³ / ₈ | 2 ⁷ / ₈ | |
| 2 | 500 | 0.31 | 1/2 | 3 ³ / ₄ | 3/8 | 2 ¹ / ₈ | 9/16 | 2 ³ / ₈ | 3 ¹ / ₁₆ | 1 ¹ / ₄ |
| 2 ¹ / ₂ | | 0.71 | | 4 ³ / ₈ | | 2 ⁷ / ₁₆ | | 3 ³ / ₈ | 3 ⁵ / ₈ | |
| 3 | | 0.78 | | 4 ⁷ / ₈ | | 2 ⁹ / ₁₆ | | 3 ³ / ₄ | 4 ¹ / ₁₆ | |
| 4 | 550 | 1.39 | 5/8 | 6 ¹ / ₈ | 3/4 | 3 ³ / ₁₆ | 9/16 | 4 ⁷ / ₈ | 5 ³ / ₁₆ | 1 ¹ / ₄ |
| 5 | | 1.66 | | 6 ³ / ₄ | | 3 ¹ / ₄ | | 5 ¹ / ₂ | 5 ³ / ₄ | |
| 6 | 600 | 2.26 | 3/4 | 7 ³ / ₄ | | 3 ³ / ₁₆ | | 6 ¹ / ₄ | 6 ⁵ / ₈ | |

CLEVIS HANGERS & SHIELDS

Fig. 67F

Copper Tube Felt Lined Hanger

Size Range: 1/2" through 6" copper tube

Material: Carbon steel and felt with adhesive backing

Finish: Zinc Plated (Hot-Dip Galvanized optional)

Service: Can be suspended by hanger rod or attached to wall. "T" slot in hanger permits side bolt to be installed after installation and setting of pipe.

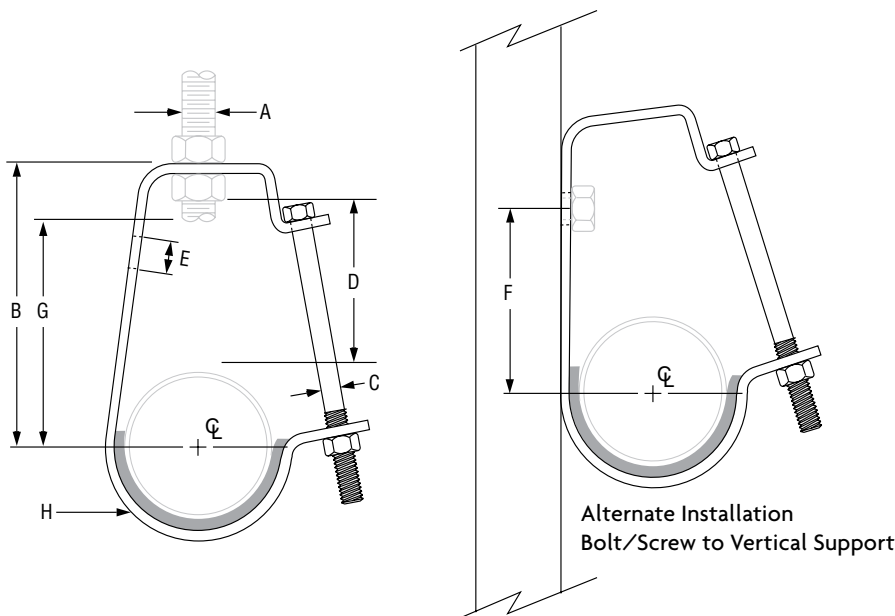
Maximum Temperature: 120°F

Approvals: Complies with Federal Specification A-A-1192A (Type 5), ANSI/MSS SP-69 and MSS SP-58 (Type 5).

Features: The layer of felt separates the copper tubing from the steel strap for electrolytic resistance and also minimizes noise and vibration.

Components: Strap and bolt with nut – assembled.

Ordering: Specify felt hanger size, figure number and name.



| FELT LINED HANGER: IPS SIZING • DIMENSIONS (IN) | |
|--|--------------------|
| Pipe Size | Felted Hanger Size |
| 3/4 | 1 1/4 |
| 1 | 1 1/2 |
| 1 1/4 | 2 |
| 1 1/2 | 2 |
| 2 | 2 1/2 |
| 2 1/2 | 3 |
| 3 | 4 |
| 4 | 5 |
| 5 | 6 |

FIG. 67F: DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS)

| Tube Size | Felt Hanger Size | Load Rating | Rod Size A | B | C | D | E | F | G | H Width | Weight |
|-----------|------------------|-------------|------------|---------|-----|---------|------|---------|---------|---------|--------|
| 1/2 | 3/4 | 400 | 3/8 | 2 1/2 | 1/4 | 1 5/8 | 7/16 | 1 5/16 | 1 3/4 | 1 | 0.22 |
| 3/4 | 1 | | | 2 11/16 | | 1 11/16 | | 1 5/8 | 1 15/16 | | 0.25 |
| 1 | 1 1/4 | | | 2 13/16 | | 1 13/16 | | 1 5/8 | 2 1/8 | | 0.27 |
| 1 1/4 | 1 1/4 | | | 3 1/8 | | 1 7/8 | | 2 | 2 9/16 | | 0.27 |
| 1 1/2 | 1 1/2 | | | 3 7/16 | | 2 1/16 | | 2 5/16 | 2 3/4 | | 0.29 |
| 2 | 2 | | | 3 3/16 | | 2 | | 2 7/16 | 2 15/16 | | 0.31 |
| 2 1/2 | 2 1/2 | 500 | 1/2 | 4 5/16 | 3/8 | 2 5/16 | 9/16 | 3 1/16 | 3 1/2 | 1 1/4 | 0.71 |
| 3 | 3 | | | 4 3/4 | | 2 1/2 | | 3 1/2 | 4 1/16 | | 0.78 |
| 4 | 4 | | | 6 1/16 | | 3 1/8 | | 4 5/8 | 5 3/16 | | 1.39 |
| 5 | 5 | | | 6 11/16 | | 3 3/16 | | 5 1/8 | 5 13/16 | | 1.66 |
| 6 | 6 | | | 7 3/4 | | 3 3/16 | | 5 15/16 | 6 3/4 | | 2.26 |
| | | | | 600 | | 3/4 | | | | | |

Fig. 250

MJ Hanger

Size Range: 2" through 6"

Material: Carbon Steel

Finish: Plain or Zinc Plated

Service: Recommended for the suspension of no hub or service weight cast iron pipe.

Ordering: Specify size, figure number, name and finish.

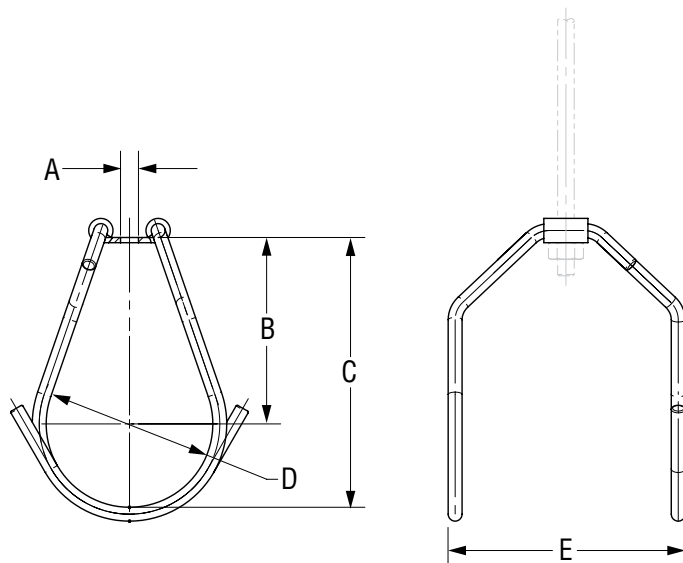


FIG. 250: DIMENSIONS (IN) • LOAD (LBS)

| Size | ϕA | ϕD | B | C | E | Max Load |
|------|----------|----------|------|-------|------|----------|
| 2 | 0.406 | 2.95 | 1.93 | 4.88 | 4.50 | 200 |
| 3 | 0.406 | 3.78 | 2.22 | 6.00 | 4.75 | 200 |
| 4 | 0.406 | 4.71 | 1.99 | 6.70 | 5.12 | 200 |
| 6 | 0.488 | 6.89 | 4.11 | 11.00 | 6.75 | 200 |

Available in zinc plated finish (Fig. 250Z).

CLEVIS HANGERS & SHIELDS

Fig. 260 (Formerly Afcon Fig. 371)

Adjustable Clevis Hanger

Size Range: 1/2" through 30"

Material: Carbon steel

Finish: Plain, 8" & Smaller: Zinc Plated (Hot-Dip Galvanized optional), 10" & Larger: Hot-Dip Galvanized with Zinc Plated Bolts & Nuts, or Primed, also available in Plastic or Epoxy Coated.

Service: Recommended for the suspension of stationary pipe lines.

Maximum Temperature: Plain 650° F, Galvanized and Epoxy 450° F

Approvals: Complies with Federal Specification A-A-1192A (Type 1), WW-H-171-E (Type 1), ANSI/MSS SP-69 and MSS SP-58 (Type 1). FM Approved (Sizes 3/4" through 8"), UL and ULC Listed (Sizes 1/2" through 8")

Installation: Hanger load nut *above* clevis must be tightened securely to assure proper hanger performance.

Adjustment: Vertical adjustment without removing pipe may be made from 3/8" through 5 1/8", varying with the size of clevis. Tighten upper nut after adjustment.

Features:

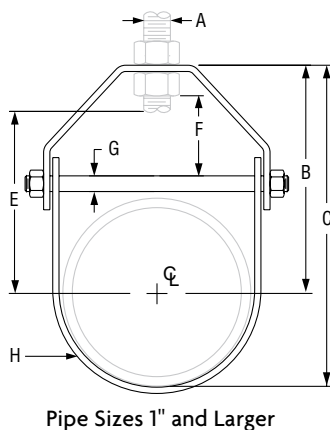
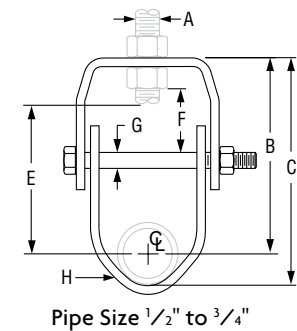
- Design has yoke on outside of lower U-strap so yoke cannot slide toward center of bolt, thus bending of bolt is minimized.
- Sizes 5" and up have rod and two nuts instead of bolt and nut; thread length on clevis rod is such that the thread locks the nuts in place, and threads are not in shear plane.

Ordering: Specify pipe size, figure number, name and finish.

Notes:

- Punched forming holes may be present on certain sizes of this clevis hanger. These holes are solely for the purpose of manufacturing, and do not effect the structural integrity or load carrying capacities of these hangers.
- For insulated line options without shields, see Figures 260 ISS and Figure 300. For insulated line options with shields, see Figures 167 and 168. For ductile iron pipe sizes, see Figure 590.
- Fig. 260F (Felt lined) – available for use for suspension of copper (or other material) so as to prevent electrolysis between the dissimilar metals of the hanger and the pipe, tube or conduit.

Caution: When an oversize clevis is used, a pipe spacer or multispacer should be placed over clevis bolt to ensure that the lower U-strap will not move in on the bolt.



| FIG. 260: DIMENSIONS (IN) • LOADS (LBS) • WEIGHTS (LBS) | | | | | | | | | | |
|---|----------|----------|--------|------------|----------|----------|----------------|-----------|-------|---------------|
| Pipe Size | Max Load | Span Ft. | Weight | Rod Size A | B | C | Rod Take Out E | Adjust. F | G | H Width Lower |
| 1/2 | 610 | 7* | 0.34 | 3/8 | 2 3/16 | 2 1/16 | 1 1/2 | 5/8 | 1/4 | 1 |
| 3/4 | | | 0.34 | | 2 | | 1 5/16 | | | |
| 1 | 0.35 | | 2 5/16 | | 3 | 1 5/8 | | | | |
| 1 1/4 | 0.40 | | 2 3/8 | | 3 1/4 | 1 11/16 | | | | |
| 1 1/2 | 730 | 9* | 0.45 | 1/2 | 2 13/16 | 3 13/16 | 2 1/8 | 7/8 | | |
| 2 | | 10* | 0.50 | | 3 5/16 | 4 1/2 | 2 5/8 | 1 1/8 | | |
| 2 1/2 | 1,350 | 11* | 0.65 | 5/8 | 4 1/16 | 5 1/2 | 3 3/16 | 1 5/16 | 3/8 | |
| 3 | | 12* | 0.85 | | 4 3/4 | 6 1/2 | 4 1/16 | 1 5/8 | | |
| 3 1/2 | | 13* | 1.10 | | 5 1/16 | 7 1/16 | 4 3/16 | 1 13/16 | | |
| 4 | 1,430 | 14* | 1.51 | 7/8 | 5 9/16 | 7 13/16 | 4 1/2 | 1 11/16 | 3/8 | 1 1/4 |
| 5 | | 16* | 1.70 | | 6 9/16 | 8 15/16 | 5 1/2 | 1 15/16 | | 1 3/16 |
| 6 | 1,940 | 17* | 3.10 | 3/4 | 6 15/16 | 10 1/4 | 5 3/4 | 1 11/16 | 1/2 | 1 7/16 |
| 8 | 2,000 | 19* | 4.75 | | 8 3/8 | 12 11/16 | 7 3/16 | 2 | | 1 3/4 |
| 10 | 3,600 | 22* | 8.60 | 7/8 | 9 7/8 | 15 1/4 | 8 7/16 | 2 1/8 | 5/8 | 2 |
| 12 | 3,800 | 23* | 11.20 | | 11 9/16 | 17 15/16 | 10 7/8 | 2 3/16 | | |
| 14 | 4,200 | 25* | 12.50 | 1 | 12 9/16 | 19 9/16 | 10 11/16 | 2 1/16 | 3/4 | 3 |
| 16 | 4,600 | 27 | 19.85 | | 14 | 22 | 12 | 2 3/4 | | |
| 18 | 4,800 | 28 | 22.25 | 1 1/4 | 15 15/16 | 24 15/16 | 13 15/16 | 3 3/16 | 3/8 | 2 1/2 |
| 20 | 4,800 | 30 | 40.33 | | 17 9/16 | 27 9/16 | 15 1/16 | 3 7/8 | | |
| 24 | 4,800 | 32 | 49.83 | 1 1/4 | 19 13/16 | 31 13/16 | 17 7/16 | 5 1/8 | 1 1/4 | 3 |
| 30** | 6,000 | 33 | 70.18 | | 24 3/16 | 39 3/16 | 21 9/16 | | | |

"Span" represents the maximum recommended distance between hangers on a continuous and straight run of horizontal standard weight steel pipe filled with water. In all cases, verify that chosen location of hangers does not subject hangers to a load greater than the maximum recommended load shown above. *Indicates that span represents the maximum span for water filled pipe as given in Table 1 of page 280.

* The 24" pipe size assembly includes a 1 1/4" SCH 40 pipe spacer over the 7/8" threaded rod.

** 30" pipe size: When assembled, the U-strap sits outside of the yoke.

Fig. 260SS

Adjustable Clevis Hanger

Size Range: 1/2" through 12"

Material: 304 stainless steel

Service: Recommended for the suspension of stationary pipe lines.

Maximum Temperature: 650° F

Approvals: Complies with Federal Specification A-A-1192A (Type 1), WW-H-171-E (Type 1), ANSI/MSS SP-69 and MSS SP-58 (Type 1).

Installation: Hanger load nut *above* clevis must be tightened securely to assure proper hanger performance.

Adjustment: Vertical adjustment without removing pipe may be made from 3/8" through 5 1/8", varying with the size of clevis. Tighten upper nut after adjustment.

Features:

- Design has yoke on outside of lower U-strap so yoke cannot slide toward center of bolt, thus bending of bolt is minimized.
- Sizes 5" and up have rod and two nuts instead of bolt and nut; thread length on clevis rod is such that the thread locks the nuts in place, and threads are not in shear plane.

Ordering: Specify pipe size, figure number and name.

Notes: Punched forming holes may be present on certain sizes of this clevis hanger. These holes are solely for the purpose of manufacturing, and do not effect the structural integrity or load carrying capacities of these hangers. For insulated line options without shields, see Figures 260 ISS and Figure 300. For ductile iron pipe sizes, see Figure 590SS.

Caution: When an oversize clevis is used, a pipe spacer or multispaceer should be placed over clevis bolt to ensure that the lower U-strap will not move in on the bolt.

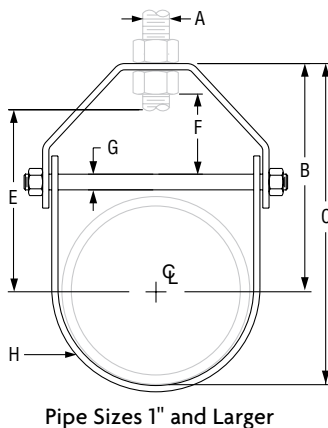
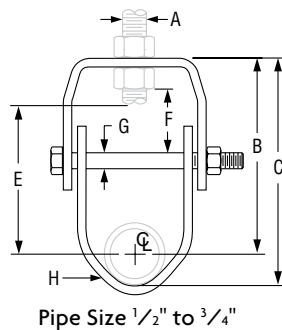


FIG. 260SS: DIMENSIONS (IN) • LOADS (LBS) • WEIGHTS (LBS)

| Pipe Size | Max Load | | Weight | Rod Size A | B | C | Rod Take Out E | Adjust. F | G | H Width Lower | |
|-----------|----------|--------|--------|------------|---------|---------|----------------|-----------|----------|---------------|---------|
| | 450° F | 650° F | | | | | | | | | |
| 1/2 | 520 | 470 | 0.34 | 3/8 | 2 3/16 | 2 1/16 | 1 1/2 | 5/8 | 1/4 | 1 | |
| 3/4 | | | 0.34 | | 2 | | 1 5/16 | | | | |
| 1 | | | 0.35 | | 3 | | 1 5/8 | | | | |
| 1 1/4 | | | 0.40 | | 3 3/4 | 1 11/16 | | | | | |
| 1 1/2 | | | 0.45 | | 3 13/16 | 2 1/8 | 7/8 | | | | |
| 2 | | | 0.50 | | 4 1/2 | 2 5/8 | 1 1/8 | | | | |
| 2 1/2 | 960 | 865 | 0.65 | 1/2 | 4 1/16 | 5 1/2 | 3 3/16 | 1 5/16 | 3/8 | | |
| 3 | | | 0.85 | | 4 3/4 | | 6 1/2 | | | | 4 1/16 |
| 4 | 1,215 | 1,095 | 1.51 | 5/8 | 5 9/16 | 7 13/16 | 4 1/2 | 1 11/16 | 3/8 | 1 3/16 | |
| 5 | | | 1.70 | | 6 9/16 | | 8 15/16 | | | | 5 1/2 |
| 6 | | | 1,650 | 1,485 | 3.10 | 3/4 | 6 15/16 | 10 1/4 | 5 3/4 | 1 11/16 | 1/2 |
| 8 | | | 1,700 | 1,530 | 4.75 | | 8 3/8 | | 12 11/16 | | |
| 10 | 1,750 | 1,575 | 8.60 | 7/8 | 9 7/8 | 15 1/4 | 8 7/16 | 2 1/8 | 5/8 | 1 3/4 | |
| 12 | 1,850 | 1,665 | 11.20 | | 11 9/16 | | 17 15/16 | | | 10 1/8 | 2 13/16 |

"Span" represents the maximum recommended distance between hangers on a continuous and straight run of horizontal standard weight steel pipe filled with water. In all cases, verify that chosen location of hangers does not subject hangers to a load greater than the maximum recommended load shown above. *Indicates that span represents the maximum span for water filled pipe as given in Table 1 of page 280.

CLEVIS HANGERS & SHIELDS

Fig. 260 ISS

Clevis Hanger with Insulation Saddle System

Size Range: 1/2" through 12" pipe and accommodates up to 2" of insulation.

Material: Carbon steel with high impact glass reinforced polypropylene saddle and carbon steel pipe spacer.

Finish: Plain, 8" & Smaller: Zinc Plated (Hot-Dip Galvanized optional), 10" & Larger: Hot-Dip Galvanized with Zinc Plated Bolts & Nuts, or Primed, also available in Plastic or Epoxy Coated.

Service: Recommended for the suspension of stationary insulated chilled or hot water pipe lines.

Maximum Temperature: 40° F to 200° F

Approvals: Dual Fire Ratings, UL E94 V, and ASTM E84 Class 1 25/60.

Installation: Hanger load nut above clevis must be tightened securely to assure proper performance. Position the pipe on the saddle. Notch insulation to fit around the saddle. Square cut adjoining insulation and butt the insulation ends to each other. Insulation joint is coated, caulked and taped following standard insulation practice used on flanges and valves.

Adjustment: Vertical adjustment without removing the hanger may be made 7/8" through 2 3/8" varying with the size of the clevis. Tighten all nuts after adjustment.

Features: V-Block design cradles pipe through out the entire erection process. Clevis bolt spacer included as standard keeps the clevis lower strap from collapsing.

Eliminates:

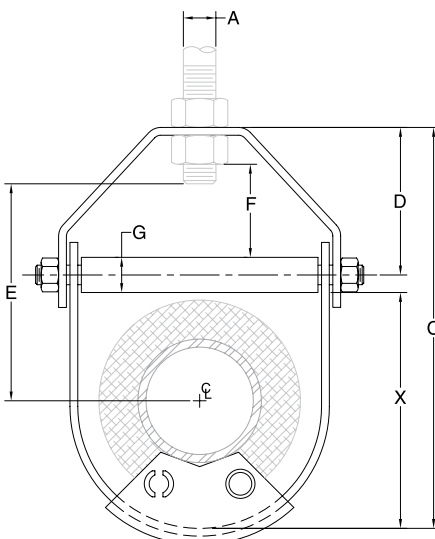
- Wood blocks and standard shields
- Costly calcium silicate inserts
- Re-leveling of piping at each individual hanger after insulation is completed.

Ordering: Specify size number, pipe size, insulation thickness, figure number name and finish.



| FIG. 260 ISS SIZING TABLE | | | | | |
|---------------------------|----------------------|------|----|--------|----|
| Pipe Size | Insulation Thickness | | | | |
| | 1/2" | 3/4" | 1" | 1 1/2" | 2" |
| (Size Number) | | | | | |
| 1/2 | 2 | 2 | 3 | — | — |
| 3/4 | 2 | 3 | 3 | — | — |
| 1 | 2 | 3 | 3 | — | — |
| 1 1/2 | 3 | 4 | 4 | — | — |
| 2 | 4 | 4 | 5 | — | — |
| 2 1/2 | 5 | 5 | 5 | 6 | 8 |
| 3 | 5 | 5 | 5 | 6 | 8 |
| 3 1/2 | 5 | 6 | 6 | 8 | 8 |
| 4 | 6 | 6 | 8 | 8 | 8 |
| 5 | 8 | 8 | 8 | 10 | 10 |
| 6 | 10 | 10 | 10 | 10 | 10 |
| 8 | 12 | 12 | 12 | 12 | 12 |
| 10 | 14 | 14 | 14 | 14 | 16 |
| 12 | 16 | 16 | 16 | 16 | — |

| FIG. 260 ISS SIZING TABLE | | | | | |
|---------------------------|----------------------|------|----|--------|----|
| Copper Tube Size | Insulation Thickness | | | | |
| | 1/2" | 3/4" | 1" | 1 1/2" | 2" |
| (Size Number) | | | | | |
| 3/8 | 2 | 2 | 3 | — | — |
| 1/2 | 2 | 2 | 3 | — | — |
| 5/8 | 2 | 2 | 3 | — | — |
| 3/4 | 2 | 2 | 3 | — | — |
| 1 | 2 | 3 | 3 | — | — |
| 1 1/4 | 3 | 3 | 3 | — | — |
| 1 1/2 | 3 | 3 | 4 | — | — |
| 2 | 4 | 4 | 4 | — | — |
| 2 1/2 | 4 | 5 | 5 | 6 | — |
| 3 | 5 | 5 | 5 | 6 | 8 |
| 3 1/2 | 5 | 5 | 6 | 8 | 8 |
| 4 | 6 | 6 | 8 | 8 | 8 |
| 5 | 8 | 8 | 8 | 8 | 10 |
| 6 | 8 | 10 | 10 | 10 | 10 |
| 8 | 10 | 10 | 12 | 12 | 12 |



2" through 16"
Patent #7,281,689

| FIG. 260 ISS: DIMENSIONS (IN) • LOADS (LBS) • WEIGHTS (LBS) | | | | | | | | |
|---|-----------|---------|------------|----------|------------------|-----------|-------|---------|
| 260 ISS Size Number | *Max Load | Weight | Rod Size A | C | **Rod Take Out E | Adjust. F | G | X |
| 2 | 550 | 0.73 | 3/8 | 4 1/2 | 2 5/8 | 7/8 | 1/4 | 2 3/8 |
| 3 | | 1.32 | 1/2 | 6 1/2 | 4 1/16 | 1 7/16 | | 3 5/8 |
| 4 | | 1.83 | 5/8 | 7 13/16 | 8 15/16 | 5 1/2 | 1 3/4 | 4 1/2 |
| 5 | 2.44 | 5 11/16 | | | | | | |
| 6 | 750 | 3.81 | 3/4 | 10 1/4 | 5 3/4 | 1 1/2 | 1/2 | 6 11/16 |
| 8 | | 5.60 | | | | | | 8 13/16 |
| 10 | | 9.73 | 7/8 | 12 11/16 | 7 3/16 | 1 3/4 | 5/8 | 8 13/16 |
| 12 | 13.80 | 10 3/4 | | | | | | |
| 14 | 1700 | 15.60 | 1 | 19 9/16 | 10 11/16 | 2 1/2 | 3/4 | 10 3/4 |
| 16 | | 26.81 | | | | | | 22 |

* Max load exceeds dead weight load requirement of pipe at max span, except 14 and 16 where max load is based on industry standard spacing of 14. Further information on typical pipe spans and piping weight per length can be found on pages 280 and 282, respectively.

** Based on maximum insulation thickness, variations due to pipe size and insulation thickness may occur.

Fig. 260 ISS Clevis Hanger with Insulation Saddle System (cont.)

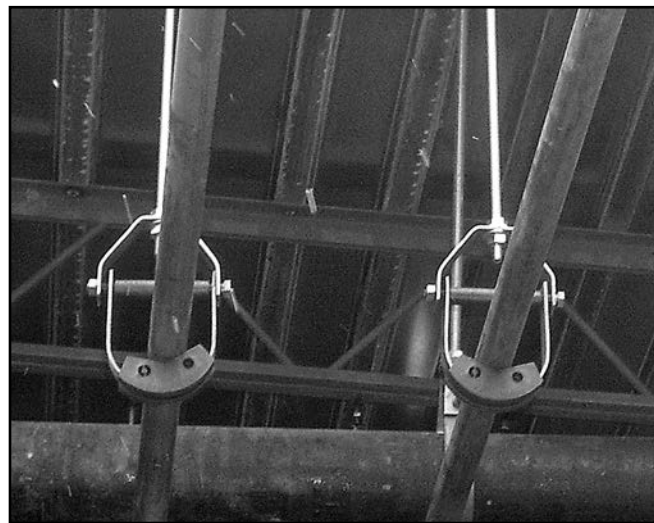
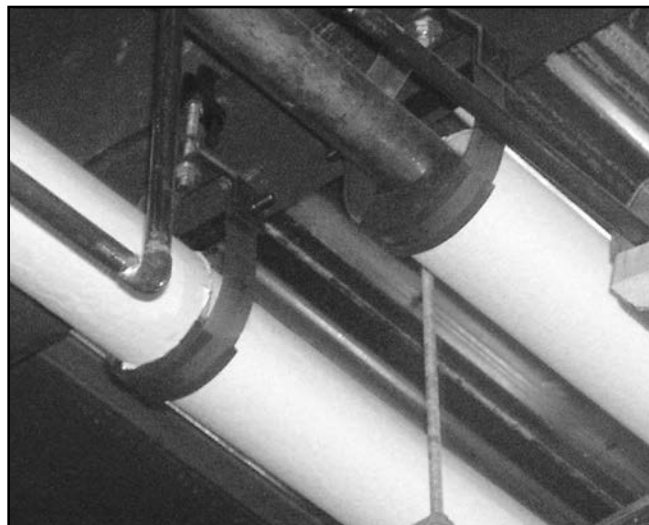
Application: Anvil's insulation saddle system clevises are fully tested and rated for a temperature range from 40°F to 200°F. Ideal for the suspension of stationary insulated chilled or hot water pipelines.

Chilled Water Testing: Extensive field-testing and inspection has been performed to confirm that the integrity of the insulation vapor barrier for chilled water systems are sustained with the 260 ISS.

To Assure Proper Vapor Barrier: Each insulation joint should be properly coated, caulked and taped. Applying standard insulation practice that is used on flanges and valves.

Features: The Anvil 260 (ISS) Insulation Saddle System reduces your overall installation time and greatly simplifies the way you insulate copper and steel pipe systems. Contractors can support insulated pipe with less parts and labor.

The revolutionary design of the 260 ISS spreads the load evenly over the lower strap of the clevis. The innovative V-Block design cradles the pipe at the design elevation throughout the erection process. The wide base V-Block design accommodates multiple pipe sizes, reducing the on-site inventory and the flexibility of pipe and insulation combinations with each size number.



ASTM & UL Fire Ratings: The 260 ISS has been independently tested by ASTM and UL for:

- Flame Spread Index (FSI)
- Smoke Development (SD) and drip ratings

Approvals from both agencies with the highest ratings for the type of product.

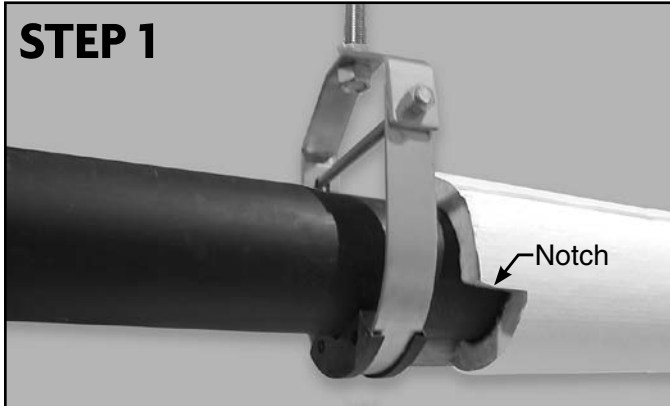
Low Thermal Conductivity: V-Block low thermal conductivity of .77 BTU-In./Sq.FT-Hr°F

Insulation R-Values: The Figure 260 ISS polymer V-Block component has an R-value ranging from 5.0 to 8.7, depending on the hanger size. Meets or exceeds most commercial insulation R-values.

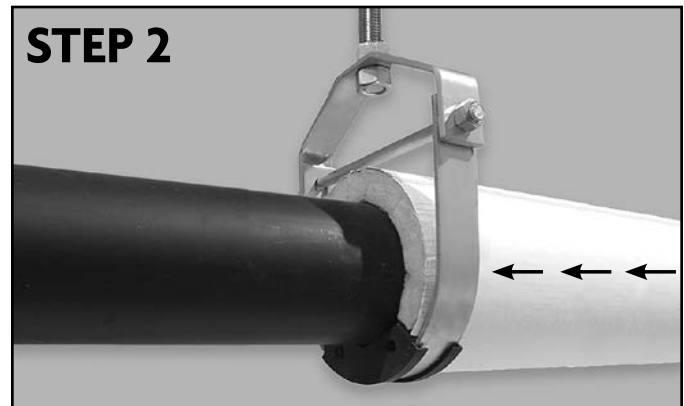
Fig. 260 ISS Clevis Hanger with Insulation Saddle System (cont.)

Easy Installation

Make sure the double hex nuts installed with the upper hanger load nut above the clevis are tightened securely. Position pipe on saddle.



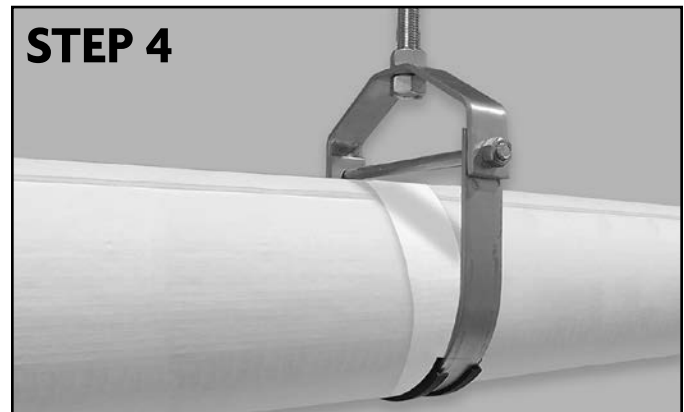
Cope or notch insulation to fit around saddle. The notch should be deep enough to extend $\frac{1}{8}$ " to $\frac{1}{4}$ " beyond the saddle.



Slide the notched insulation section over saddle.



Square cut adjoining insulation and butt the insulation ends to each other.



Caulk joints and finish taping.

To assure proper vapor barrier: Each insulation joint should be properly coated, caulked and taped. Applying standard insulation practice that is used on flanges and valves. Finish via standard taping method.

For chilled systems a mastic for thermal insulations or similar sealant is typically used:

Systems (50°F or greater) apply sealant to:

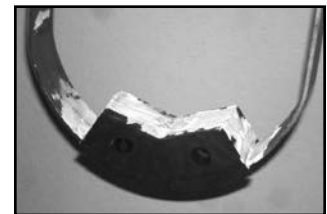
- The coped and flat edges of the mating insulation sections.
- The V-Block saddle at the insulation interface.

Systems (Below 50°F) apply sealant as per 50 Degrees with additional sealant to:

- The V-Block saddle joint between the two saddle halves.



Mastic applied to V-Block saddle at insulation interface. (50°F or greater)



Additional sealant applied to V-Block saddle joint between the two saddle halves. (Chilled water below 50°F)

Fig. 300

Adjustable Clevis for Insulated Lines

Size Range: 3/4" through 12"

Material: Carbon steel

Finish: Plain, 8" & Smaller: Zinc Plated (Hot-Dip Galvanized optional), 10" & Larger: Hot-Dip Galvanized with Zinc Plated Bolts & Nuts or Epoxy Coated

Service: Recommended for suspension of insulated **stationary** pipe lines.

Maximum Temperature: Plain 650° F, Galvanized and Epoxy 450° F

Approvals: Complies with Federal Specification A-A-1192A (Type 1), WW-H-171-E (Type 1), ANSI/MSS SP-69 and MSS SP-58 (Type 1).

Installation: Hanger load nut above clevis must be tightened securely to assure proper hanger performance.

Adjustment: Vertical adjustment is provided, varying with the size of the clevis. Tighten upper nut after adjustment.

Features:

- Designed for 2" of insulation on 3/4" through 1 1/2" pipe and 4" of insulation on 2" and larger pipe.
- When properly installed, clevis bolt is outside the insulation.

Ordering: Specify pipe size, figure number, name and finish.

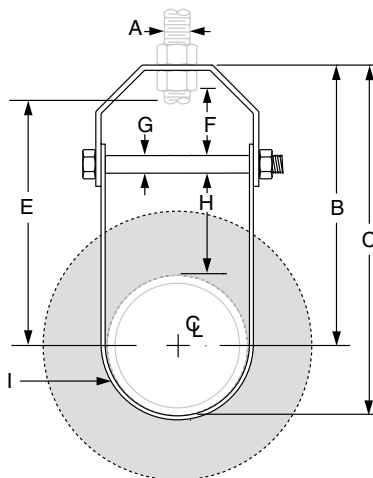


FIG. 300: DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS)

| Pipe Size | Max Load | Weight | Rod Size A | B | C | E | Adjustment F | G | H | I Width Lower | | |
|-----------|----------|--------|------------|--------|---------|--------|--------------|-----|---|---------------|-----|-------|
| 3/4 | 730 | 0.51 | 3/8 | 3 5/8 | 4 1/4 | 2 7/8 | 1/2 | 1/4 | 2 | 1 | | |
| 1 | | 0.58 | | 4 | 4 11/16 | 3 1/4 | 5/8 | | | | | |
| 1 1/4 | | 0.64 | | 4 7/16 | 5 1/4 | 3 5/8 | 7/8 | | | | | |
| 1 1/2 | | 0.72 | | 4 3/4 | 5 3/4 | 4 1/16 | 1 1/16 | | | | | |
| 2 | | 0.85 | | 7 7/16 | 8 1/16 | 6 1/2 | 1 5/8 | | | | | |
| 2 1/2 | 1,350 | 1.90 | 1/2 | 8 7/16 | 9 15/16 | 7 1/2 | 2 | 3/8 | 4 | 1 1/4 | | |
| 3 | | 2.00 | | 8 5/8 | 10 5/16 | 7 9/16 | 1 3/4 | | | | | |
| 4 | 1,430 | 2.50 | 5/8 | 9 3/8 | 11 5/8 | 8 3/16 | 1 15/16 | 1/2 | | | 4 | 1 1/2 |
| 5 | | 3.00 | | 9 7/8 | 12 5/8 | 8 3/4 | 1 7/8 | | | | | |
| 6 | | 3.40 | | 10 5/8 | 14 | 9 3/8 | 2 | | | | | |
| 8 | 2,000 | 6.70 | 3/4 | 12 3/8 | 16 3/4 | 11 | 2 | 5/8 | 4 | 1 3/4 | | |
| 10 | 3,600 | 11.0 | | 13 3/4 | 19 9/16 | 12 1/4 | 2 1/8 | | | | | |
| 12 | 3,800 | 13.8 | | 15 1/8 | 21 9/16 | 13 5/8 | 2 7/16 | | | | 3/4 | 2 |

CLEVIS HANGERS & SHIELDS

Fig. 590

Adjustable Clevis for Ductile or Cast Iron Pipe

Size Range: 3" through 24" ductile or cast iron pipe

Material: Carbon steel

Finish: Plain or Hot-Dip Galvanized with Zinc Plated Bolts & Nuts

Service: Recommended for the suspension of **stationary** ductile iron or cast iron pipe.

Maximum Temperature: Plain 650° F, Galvanized 450° F

Approvals: Complies with Federal Specification A-A-1192A (Type 1) WW-H-171-E (Type 1), ANSI/MSS SP-69 and MSS SP-58 (Type 1).

Installation: Hanger rod nut above clevis must be tightened securely to assure proper hanger performance.

Adjustment: Vertical adjustment without removing pipe may be made from 1¹⁵/₁₆" through 3³/₁₆", varying with the size of the clevis. Tighten upper nut after adjustment.

Ordering: Specify pipe size, figure number, name and finish.

Note: Figure 590 sizes 12" and below typically feature a Figure 260 Top Component.

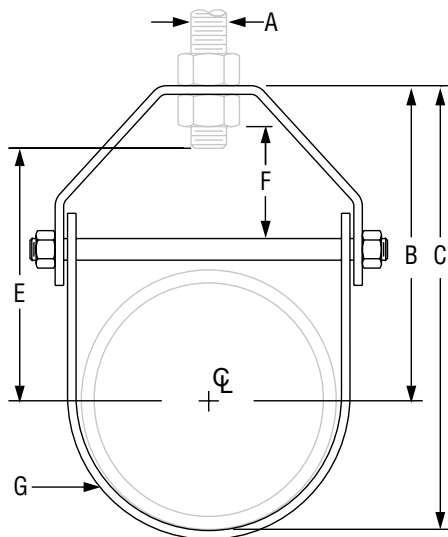


FIG. 590: DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS)

| D.I./C.I. Pipe Size | Max Load | Weight | D.I./C.I. Pipe O.D. | Rod Size A | B | C | E | F | G Width Lower |
|---------------------|----------|--------|---------------------|-------------------------------|----------------------------------|----------------------------------|----------------------------------|---------------------------------|-------------------------------|
| 3 | 1,350 | 1.10 | 3.96 | 1/2 | 5 ⁵ / ₁₆ | 7 ¹ / ₁₆ | 4 ³ / ₁₆ | 1 ¹³ / ₁₆ | 1 ¹ / ₄ |
| 4 | 1,430 | 1.64 | 4.80 | 5/8 | 5 ³ / ₄ | 8 ³ / ₁₆ | 4 ³ / ₄ | 1 ¹⁵ / ₁₆ | |
| 6 | 1,940 | 4.26 | 6.90 | 3/4 | 7 ⁷ / ₈ | 10 ⁹ / ₁₆ | 5 ⁵ / ₁₆ | | 2 ¹ / ₄ |
| 8 | 2,000 | 6.70 | 9.05 | | 10 ¹⁰ / ₁₆ | 15 ¹¹ / ₁₆ | 8 ³ / ₄ | 2 ⁵ / ₁₆ | |
| 10 | 3,600 | 9.73 | 11.10 | 7/8 | 12 ¹ / ₁₆ | 18 ¹¹ / ₁₆ | 10 ¹¹ / ₁₆ | 2 ⁷ / ₈ | 2 |
| 12 | 3,800 | 13.64 | 13.20 | | 13 ³ / ₄ | 20 ⁷ / ₈ | 11 ⁵ / ₁₆ | | |
| 14 | 4,200 | 16.04 | 15.30 | 1 | 14 ¹ / ₄ | 22 ¹⁵ / ₁₆ | 12 ⁹ / ₁₆ | 2 ⁷ / ₁₆ | 2 ¹ / ₂ |
| 16 | 4,600 | 24.52 | 17.40 | | 16 ⁷ / ₈ | 26 ⁵ / ₈ | 15 ³ / ₁₆ | | |
| 18 | 4,800 | 27.45 | 19.50 | 1 ¹ / ₄ | 18 ³ / ₄ | 29 ⁹ / ₁₆ | 16 ³ / ₈ | 3 ¹³ / ₁₆ | 3 |
| 20 | 4,800 | 46.24 | 21.60 | | 20 ⁵ / ₁₆ | 33 ¹ / ₄ | 18 ³ / ₈ | | |
| 24 | 4,800 | 57.10 | 25.80 | | | | | | |

Fig. 590SS

Adjustable Clevis for Ductile or Cast Iron Pipe

Size Range: 4" through 12" ductile or cast iron pipe

Material: 304 stainless steel

Service: Recommended for the suspension of **stationary** ductile iron or cast iron pipe.

Approvals: Complies with Federal Specification A-A-1192A (Type 1)

WW-H-171-E (Type 1), ANSI/MSS SP-69 and MSS SP-58 (Type 1).

Installation: Hanger rod nut above clevis must be tightened securely to assure proper hanger performance.

Adjustment: Vertical adjustment without removing pipe may be made from 1¹⁵/₁₆" through 3³/₁₆", varying with the size of the clevis. Tighten upper nut after adjustment.

Ordering: Specify pipe size, figure number and name.

Note: Figure 590 typically feature a Figure 260SS Top Component.

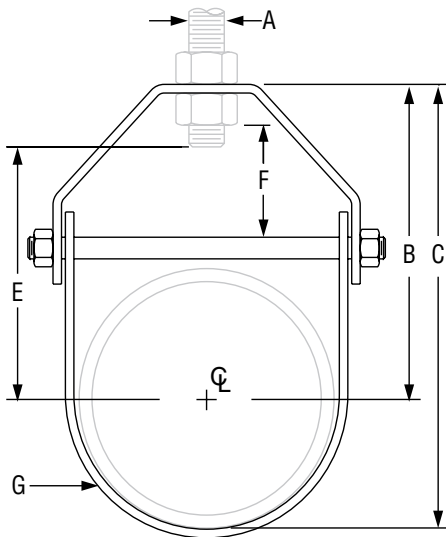


FIG. 590SS: DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS)

| D.I./C.I. Pipe Size | Max Load | | Weight | D.I./C.I. Pipe O.D. | Rod Size A | B | C | E | F | G Width Lower |
|------------------------|----------|--------|--------|------------------------|---------------|-------|----------|----------|---------|------------------|
| | 450° F | 650° F | | | | | | | | |
| 4 | 1,215 | 1,095 | 1.64 | 4.80 | 5/8 | 5 3/4 | 8 3/16 | 4 3/4 | 1 15/16 | 1 1/4 |
| 6 | 1,650 | 1,485 | 4.26 | 6.90 | 3/4 | 7 1/8 | 10 9/16 | 5 5/16 | | 1 1/2 |
| 8 | 1,700 | 1,530 | 6.70 | 9.05 | | 7/8 | 8 5/8 | 13 3/16 | 7 1/2 | 2 1/4 |
| 10 | 1,750 | 1,575 | 9.73 | 11.10 | 10 1/8 | | 15 11/16 | 8 3/4 | 2 5/16 | 2 |
| 12 | 1,850 | 1,665 | 13.64 | 13.20 | 12 1/16 | | 18 11/16 | 10 11/16 | 2 7/8 | |

CLEVIS HANGERS & SHIELDS

Fig. 167

Insulation Protection Shield

Size Range: 1/2" through 24" pipe with up to 2" thick insulation

Material: Carbon steel

Finish: Pre-Galvanized Material

Service: Recommended for outside of foam or fiber glass insulation for distribution of loads to preclude crushing of insulation without breaking the vapor barrier.

Approvals: Complies with Federal Specification A-A-1192A (Type 40), WW-H-171-E (Type 41), ANSI/MSS SP-69 and MSS SP-58 (Type 40).

How to size: Refer to "shield size selection table" below.

Features: Chamfered cupped ends for safe non-sharp edges.

Ordering: Specify size, figure number and name. Data applicable to shields for thicker insulation or larger pipe sizes is available upon request.



FIG. 167: DIMENSIONS (IN) • WEIGHT (LBS)

| Shield Size | Weight | Stock Size | L | Insulation OD | Fig. 260 |
|-------------|--------|------------|----|---------------|----------|
| X1A | 0.5 | 18 Ga. | 12 | 1.90 | 1 1/2 |
| 1A | 0.7 | | | 2.38 | 2 |
| 2A | 0.8 | | | 2.88 | 2 1/2 |
| 3A | 1.0 | | | 3.50 | 3 |
| 4A | 1.1 | | | 4.00 | 3 1/2 |
| 5A | 1.3 | | | 4.50 | 4 |
| 6A | 1.4 | | | 5.00 | 5 |
| 7A | 1.6 | | | 5.56 | 5 |
| 8A | 1.9 | | | 6.64 | 6 |
| 9A | 2.7 | | | 7.64 | 8 |
| 10A | 3.1 | 16 Ga. | 18 | 8.64 | 8 |
| 9B | 4.0 | | | 7.64 | 8 |
| 10B | 4.6 | 16 Ga. | 18 | 8.64 | 8 |
| 11B | 5.1 | | | 9.64 | 10 |
| 12B | 5.6 | 14 Ga. | 24 | 10.76 | 10 |
| 13C | 10.2 | | | 11.76 | 12 |
| 14C | 11.1 | | | 12.76 | 12 |
| 15C | 12.3 | | | 14.00 | 14 |
| 16C | 12.7 | | | 15.00 | 16 |
| 17C | 13.6 | | | 16.00 | 16 |
| 18C | 14.5 | | | 17.00 | 18 |
| 19C | 21.2 | | | 18.00 | 18 |
| 20C | 22.4 | | | 19.00 | 20 |
| 21C | 23.6 | | | 20.00 | 20 |
| 22C | 24.8 | 12 Ga. | 24 | 21.00 | 24 |
| 23C | 25.9 | | | 22.00 | 24 |
| 24C | 27.1 | | | 23.00 | 24 |
| 25C | 28.3 | | | 24.00 | 24 |
| 26C | 31.0 | | | 26.00 | 30 |
| 27C | 31.8 | | | 27.00 | 30 |
| 28C | 33.0 | 28.00 | 30 | | |

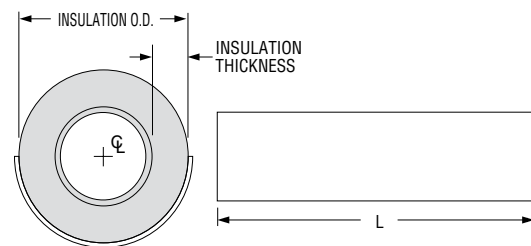
SHIELD SIZE SELECTION FOR NOMINAL PIPE SIZE

| Pipe Size | Insulation Thickness (in) | | | | |
|-----------|---------------------------|-----|-----|-------|-----|
| | 1/2 | 3/4 | 1 | 1 1/2 | 2 |
| 1/2 | 1A | 1A | — | — | — |
| 3/4 | | 2A | 3A | 4A | 6A |
| 1 | | | 5A | 7A | |
| 1 1/4 | 2A | 3A | 4A | 6A | 7A |
| 1 1/2 | | 8A | | | |
| 2 | 3A | 4A | 5A | 7A | 8A |
| 2 1/2 | 4A | 5A | 6A | 8A | 9A |
| 3 | 5A | 6A | 7A | | |
| 3 1/2 | — | — | 8A | 9A | 10A |
| 4 | — | — | 9B | 10B | 11B |
| 5 | — | — | 10B | 11B | 12B |
| 6 | — | — | 12B | 13C | 14C |
| 8 | — | — | 14C | 15C | 16C |
| 10 | — | — | 16C | 17C | 18C |
| 12 | — | — | 17C | 18C | 19C |
| 14 | — | — | 19C | 20C | 21C |
| 16 | — | — | 21C | 22C | 23C |
| 18 | — | — | 23C | 24C | 25C |
| 20 | — | — | 26C | 27C | 28C |

SHIELD SIZE SELECTION FOR COPPER TUBING

| Tube Size | Insulation Thickness (in) | | | | |
|---------------|---------------------------|-----|-----|-------|-----|
| | 1/2 | 3/4 | 1 | 1 1/2 | 2 |
| 3/8 | X1A | 1A | 2A | 3A | 5A |
| 1/2, 5/8, 3/4 | | | | 4A | 6A |
| 1, 1 1/4 | 1A | 2A | 3A | 5A | 7A |
| 1 1/2 | 2A | 3A | 4A | 6A | 8A |
| 2 | 3A | 4A | 5A | 7A | |
| 2 1/2 | 4A | 5A | 6A | 8A | 9A |
| 3 | 5A | 6A | 7A | | |
| 3 1/2 | 6A | 7A | 8A | 9A | 10A |
| 4 | 7A | 8A | | | |
| 5 | 8A | 9A | 9A | 10A | 11B |
| 6 | 9A | | 10A | 11B | 12B |
| 8 | 11B | 11B | 12B | 13C | 14C |

Shading in gray indicates this shield fits loosely inside the Fig. 260. To be used properly, the Fig. 260 requires a spacer.



Note: As actual foam or fiber glass insulation thicknesses vary, verify that the radius of the selected shield is suitable for the required application. Shields are designed for a maximum span of ten feet on 15 P.S.I. compressive strength insulation. For compressive strengths greater than 15 P.S.I., spans may be increased proportionately up to maximum allowable for steel pipe. Refer to MSS-SP-69 for specific guidelines on compressive strength and maximum span.

Fig. 168

Rib-Lok Shield

Size Range: 1/2" through 8" pipe or copper tube with up to 2" insulation

Material: Carbon steel

Finish: Pre-Galvanized Material

Approvals: Complies with Federal Specification A-A-1192A (Type 40), WW-H-171-E (Type 41), ANSI/MSS SP-69 and MSS SP-58 (Type 40).

Service: To be used with Fig. 65 or Fig. 260 clevis. Designed to prevent damage to insulation by hanger. Ribs keep shield centered in hanger.

How to size: Refer to shield size selection table below.

Ordering: Specify size, figure number and name.

Note: Data applicable to shields for thicker insulation or larger pipe size is available upon request.



SHIELD SIZE SELECTION FOR NOMINAL PIPE SIZE

| Pipe Size | Insulation Thickness (in) | | | | |
|-----------|---------------------------|-----|----|-------|----|
| | 1/2 | 3/4 | 1 | 1 1/2 | 2 |
| 1/2 | 1 | 1 | – | – | – |
| 3/4 | | | 2 | 4 | 6 |
| 1 | | | 3 | 5 | 7 |
| 1 1/4 | 2 | 3 | 3 | 6 | |
| 1 1/2 | | | 4 | 7 | 8 |
| 2 | 3 | 4 | 5 | 7 | 8 |
| 2 1/2 | 4 | 5 | 6 | 8 | 9 |
| 3 | 5 | 6 | 7 | 9 | 10 |
| 3 1/2 | – | – | 8 | 9 | 10 |
| 4 | | | 9 | 10 | 11 |
| 5 | | | 10 | 11 | 12 |
| 6 | | | 11 | 12 | 13 |
| 8 | | | 12 | 13 | 14 |

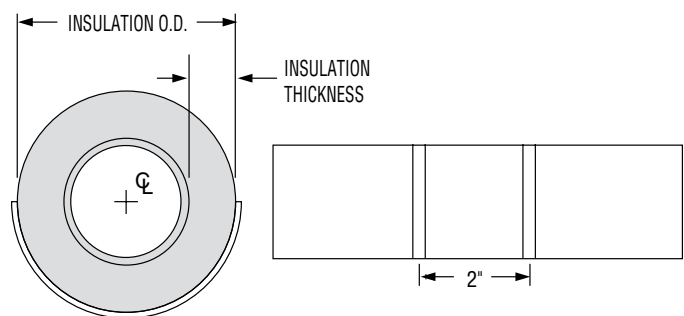
SHIELD SIZE SELECTION FOR COPPER TUBING

| Tube Size | Insulation Thickness (in) | | | | |
|-----------|---------------------------|-----|----|-------|----|
| | 1/2 | 3/4 | 1 | 1 1/2 | 2 |
| 3/8 | – | 1 | 2 | 3 | 5 |
| 1/2, 5/8 | | 1 | 2 | 4 | 6 |
| 1 | 1 | 2 | 3 | 5 | 7 |
| 1 1/4 | | | | | |
| 1 1/2 | 2 | 3 | 4 | 6 | 8 |
| 2 | 3 | 4 | 5 | 7 | |
| 2 1/2 | 4 | 5 | 6 | 8 | 9 |
| 3 | 5 | 6 | 7 | 9 | |
| 3 1/2 | 6 | 7 | 8 | 9 | 10 |
| 4 | 7 | | | | |
| 5 | 8 | 8 | 9 | 10 | 11 |
| 6 | 9 | 9 | 10 | 11 | 12 |
| 8 | 11 | 11 | 12 | 13 | 14 |

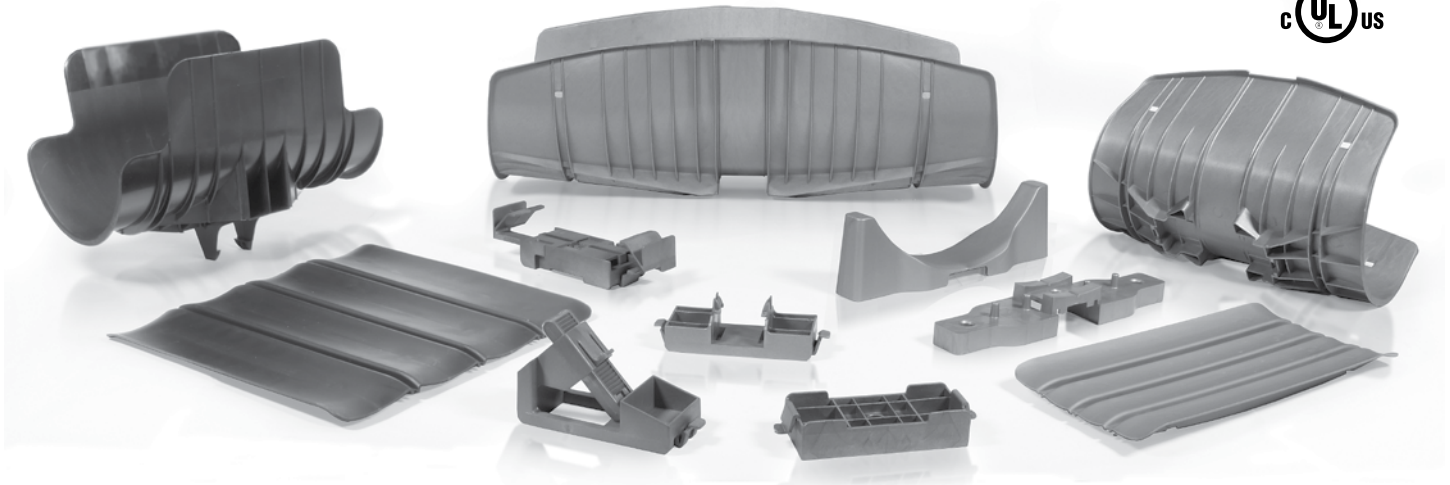
FIG. 168: DIMENSIONS (IN) • WEIGHT (LBS)

| Shield Size | Max O.D. of Insulation | Stock Sizes | Weight | Fig. 260 |
|-------------|------------------------|-------------|--------|----------|
| 1 | 2 5/8 | 18 ga. x 8 | 0.41 | 2 |
| 2 | 2 7/8 | | 0.50 | 2 1/2 |
| 3 | 3 1/2 | | 0.61 | 3 |
| 4 | 4 | | 0.69 | 3 1/2 |
| 5 | 4 1/2 | | 0.78 | 4 |
| 6 | 5 | | 0.99 | 5 |
| 7 | 5 5/8 | | 1.09 | 5 |
| 8 | 6 5/8 | | 1.28 | 6 |
| 9 | 7 5/8 | | 1.51 | 8 |
| 10 | 8 5/8 | | 2.24 | 8 |
| 11 | 9 5/8 | 18 ga. x 12 | 2.48 | 10 |
| 12 | 10 3/4 | | 2.76 | 10 |
| 13 | 11 3/4 | | 3.03 | 12 |
| 14 | 12 3/4 | | 3.28 | 12 |

☐ Shading in gray indicates this shield fits loosely inside the Fig. 260. To be used properly, the Fig. 260 requires a spacer.



ANVIL SHIELDS



Anvil Shields allow for the support of insulated horizontal refrigeration, mechanical, and plumbing pipe and tube.

The Universal Shield allows for quick and easy installation to I-beams, steel angle, clevis hangers, and the floor through patented, interchangeable inserts.

Features and Benefits:

- Tool Free Installation
- -40°F to 178°F
- >40% faster to install than metal or standard plastic shields
- 80% faster to install than clamps and collars
- Non-adhesive surface allows for the linear expansion of thermal insulation and eliminates insulation tears.



Fig. 30 Universal Shield with Attachments

Fig. 20

Strut Shield

Size Range: Up to 8¹/₄" O.D. Insulation

Material: UV Resistant Polypropylene Copolymer (Size F 20% Glass Filled)

Temperature: Operating temperature between -40°F to 178°F (-40°C to 81°C)

Color: Black or White

Service: Support of insulated horizontal refrigeration, air conditioning, and plumbing pipe.

Approvals: UL classified for USA (UL-723 (ASTM E84)) and ULC listed for Canada (ULC-S102.2)

Installation: Clip directly on Anvil-Strut™ AS200 1⁵/₈" x 1⁵/₈" strut channel.

Ordering: Specify figure number, size, and color. Anvil Shields allow for the support of insulated horizontal refrigeration, air conditioning, and plumbing pipe and tube.

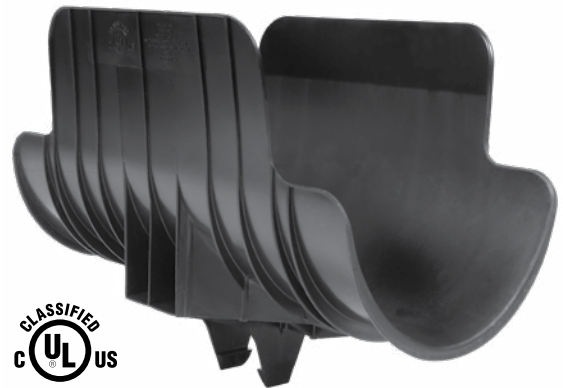


FIG. 20: DIMENSIONS (IN)

| Size | A | B | C | D | E |
|------|-------------------------------|---------------------------------|--------------------------------|----|-------------------------------|
| A | 2 ¹ / ₄ | 4 ⁹ / ₁₆ | 1 ¹ / ₁₆ | 12 | 1 ⁵ / ₈ |
| B | 3 ¹ / ₄ | 5 ⁹ / ₁₆ | 1 ⁹ / ₁₆ | | |
| C | 4 ¹ / ₄ | 6 ⁹ / ₁₆ | 2 ¹ / ₁₆ | | |
| D | 5 ¹ / ₄ | 7 ⁹ / ₁₆ | 2 ⁹ / ₁₆ | | |
| E | 6 ¹ / ₄ | 8 ⁹ / ₁₆ | 3 ¹ / ₁₆ | | |
| F | 8 ¹ / ₄ | 11 ¹ / ₁₆ | 4 ¹ / ₄ | | |

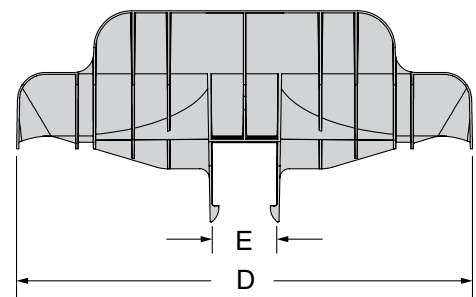
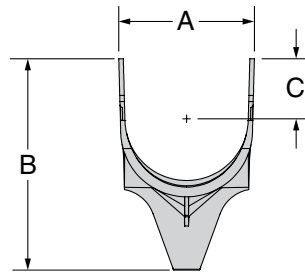


FIG. 20 SIZING TABLE FOR COPPER TUBE

| CTS Tube | Tube O.D. | Insulation Thickness | | | | |
|----------|-----------|----------------------|------|----|--------|----|
| | | 1/2" | 3/4" | 1" | 1 1/2" | 2" |
| 1/4" | 0.375 | A | A | B | C | D |
| 3/8" | 0.500 | | | | | |
| 1/2" | 0.625 | | | | | |
| 5/8" | 0.750 | | | | | |
| 3/4" | 0.875 | | | | | |
| 1" | 1.125 | B | C | D | E | |
| 1 1/4" | 1.375 | | | | | |
| 1 1/2" | 1.625 | C | D | E | F | |
| 2" | 2.125 | | | | | |
| 2 1/2" | 2.625 | D | E | F | - | |
| 3" | 3.125 | | | | | |
| 4" | 4.125 | E | F | - | - | |
| | | | | | | |

FIG. 20 SIZING TABLE FOR NPS PIPE

| NPS Pipe | Pipe O.D. | Insulation Thickness | | | | |
|----------|-----------|----------------------|------|----|--------|----|
| | | 1/2" | 3/4" | 1" | 1 1/2" | 2" |
| 1/4" | 0.504 | A | A | B | C | D |
| 3/8" | 0.675 | | | | | |
| 1/2" | 0.840 | | | | | |
| 3/4" | 1.050 | B | C | D | E | |
| 1" | 1.315 | | | | | |
| 1 1/4" | 1.660 | C | D | E | F | |
| 1 1/2" | 1.900 | | | | | |
| 2" | 2.375 | D | E | F | - | |
| 2 1/2" | 2.875 | | | | | |
| 3" | 3.500 | E | F | - | - | |
| 3 1/2" | 4.000 | | | | | |
| 4" | 4.500 | F | - | - | - | |
| 5" | 5.563 | | | | | |
| 6" | 6.625 | - | - | - | - | |
| | | | | | | |

The sizing chart above represents recommendations based on nominal insulation thicknesses and it does not include manufacturing tolerances for insulation, steel jacketing, or other factors which may influence the outer diameter of the insulation. To determine the best product for your application, please reference the Fig. 20's "A" dimension.

Fig. 21

Strut Shield Insulation Cover

Size Range: Up to 8¹/₄" O.D. Insulation

Material: UV Resistant Polypropylene

Temperature: Operating temperature between -40°F to 178°F (-40°C to 81°C)

Color: Black or White

Approvals: UL classified for USA (UL-723 (ASTM E84)) and ULC listed for Canada (ULC-S102.2)

Installation:

- Cut to desired size.
- Place over insulation and line up mounting notches with Fig. 20.
- Secure insulation shield with tie wraps.

Ordering: Specify figure number, size, and color.

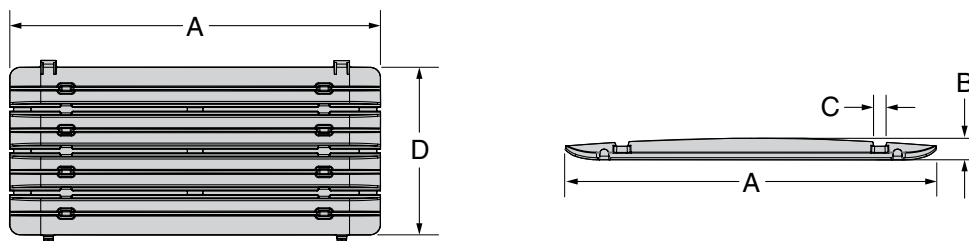


FIG. 21: DIMENSIONS (IN)

| Size | A | B | C | D | Fig. 20 Size |
|------|----|--------------------------------|------------------|---------------------------------|--------------|
| A | 12 | 1 ³ / ₁₆ | 7/ ₁₆ | 5 ⁷ / ₁₆ | A to E |
| B | | | | 11 ¹ / ₁₆ | F |

Fig. 30

Universal Shield

Size Range: Up to 12⁵/₈" O.D. Insulation

Material: UV Resistant Polypropylene 20% Glass Filled

Temperature: Operating temperature between -40°F to 178°F (-40°C to 81°C)

Color: Gray

Service: Support of insulated horizontal refrigeration, air conditioning, and plumbing pipe.

Approvals: UL classified for USA (UL-723 (ASTM E84)) and ULC listed for Canada (ULC-S102.2)

Installation: Install on Fig. 260 clevis hanger or clip into Fig. 32, 33, 34, 36, or 37. When installed with Fig. 260 clevis hanger secure with Fig. 31.

Ordering: Specify figure number and size.

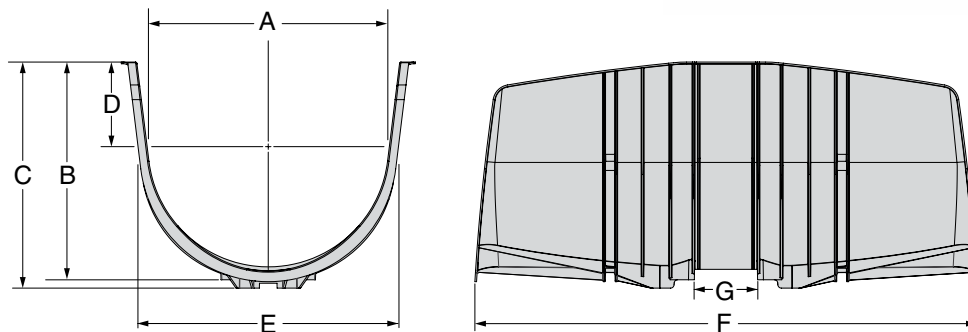
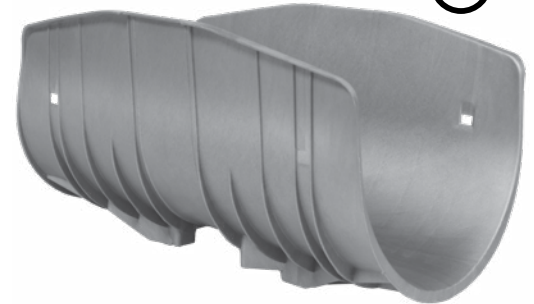


FIG. 30: DIMENSIONS (IN)

| Size | A | B | C | D | E | F | G | Fig. 260 Size |
|------|--------------------------------|---------------------------------|--------------------------------|---------------------------------|---------------------------------|----|--------------------------------|---------------|
| A | 2 ⁵ / ₁₆ | 1 ¹⁵ / ₁₆ | 2 ⁵ / ₁₆ | 3/ ₈ | 2 ⁷ / ₁₆ | 12 | 1 ³ / ₁₆ | 2 |
| B | 3 ⁷ / ₁₆ | 3 ³ / ₁₆ | 3 ⁹ / ₁₆ | 1 ¹ / ₁₆ | 3 ⁹ / ₁₆ | 12 | 1 ¹ / ₂ | 3 |
| C | 4 ¹ / ₂ | 3 ⁷ / ₈ | 4 ³ / ₁₆ | 1 ³ / ₁₆ | 4 ⁵ / ₈ | 12 | 1 ³ / ₄ | 4 |
| D | 5 ⁹ / ₁₆ | 4 ⁷ / ₈ | 5 ³ / ₁₆ | 1 ¹¹ / ₁₆ | 5 ³ / ₄ | 12 | | 5 |
| E | 6 ⁵ / ₈ | 5 ¹⁵ / ₁₆ | 6 ¹ / ₄ | 2 ³ / ₁₆ | 6 ³ / ₄ | 12 | 2 ¹ / ₁₆ | 6 |
| F | 8 ⁵ / ₈ | 7 ¹³ / ₁₆ | 8 ¹ / ₈ | 3 ¹ / ₁₆ | 8 ³ / ₄ | 18 | 2 ¹ / ₄ | 8 |
| G | 10 ⁵ / ₈ | | | 1 ³ / ₄ | 10 ⁹ / ₁₆ | 23 | | 10 |
| H | 12 ⁵ / ₈ | 9 ³ / ₁₆ | 9 ¹ / ₂ | 2 ¹ / ₈ | 12 ¹ / ₂ | 23 | | 12 |

FIG. 30 SIZING TABLE FOR COPPER TUBE

| CTS Tube | Tube O.D. | Insulation Thickness | | | | |
|----------|-----------|----------------------|------|----|--------|----|
| | | 1/2" | 3/4" | 1" | 1 1/2" | 2" |
| 1/4" | 0.375 | A | A | B | B | C |
| 3/8" | 0.500 | | | | C | D |
| 1/2" | 0.625 | | C | D | E | |
| 5/8" | 0.750 | | D | E | F | |
| 3/4" | 0.875 | | E | F | | |
| 1" | 1.125 | B | C | D | E | F |
| 1 1/4" | 1.375 | | | | | |
| 1 1/2" | 1.625 | C | D | E | F | |
| 2" | 2.125 | D | E | F | | |
| 2 1/2" | 2.625 | E | F | | | |
| 3" | 3.125 | F | | | | |
| 4" | 4.125 | | | | | |

FIG. 30 SIZING TABLE FOR NPS PIPE

| NPS Pipe | Pipe O.D. | Insulation Thickness | | | | |
|----------|-----------|----------------------|------|----|--------|----|
| | | 1/2" | 3/4" | 1" | 1 1/2" | 2" |
| 1/4" | 0.504 | A | A | B | C | D |
| 3/8" | 0.675 | | | | | |
| 1/2" | 0.840 | | C | D | | |
| 3/4" | 1.050 | | D | E | | |
| 1" | 1.315 | | E | F | | |
| 1 1/4" | 1.660 | B | C | D | E | F |
| 1 1/2" | 1.900 | | | | | |
| 2" | 2.375 | C | D | E | F | |
| 2 1/2" | 2.875 | D | E | F | | |
| 3" | 3.500 | E | F | G | | |
| 3 1/2" | 4.000 | F | G | H | | |
| 4" | 4.500 | G | H | | | |
| 5" | 5.563 | H | | | | |
| 6" | 6.625 | | | | | |
| 8" | 8.625 | | | | | |
| 10" | 10.75 | | | | | |

The sizing chart above represents recommendations based on nominal insulation thicknesses and it does not include manufacturing tolerances for insulation, steel jacketing, or other factors which may influence the outer diameter of the insulation. To determine the best product for your application, please reference the Fig. 30's "A" dimension.

Fig. 31

Universal Shield Clevis Adapter

Size Range: From 2" through 12" Clevis (Fig. 260) when used with Fig. 30.
Material: UV Resistant Polypropylene 20% Glass Filled
Temperature: Operating temperature between -40°F to 178°F (-40°C to 81°C)
Color: Gray
Service: Support of insulated horizontal refrigeration, air conditioning, and plumbing pipe when used with Fig. 30.
Approvals: UL classified for USA (UL-723 (ASTM E84)) and ULC listed for Canada (ULC-S102.2)
Installation: After installation of Fig. 30 with Fig 260 clevis hanger, clip into the bottom of the Fig. 30 in order to secure the Fig. 260.
Ordering: Specify figure number and size.

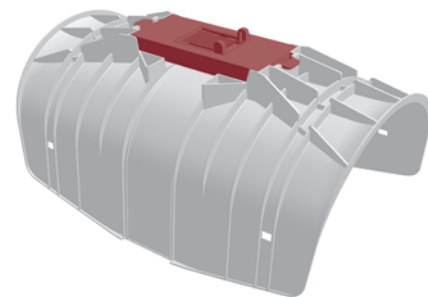
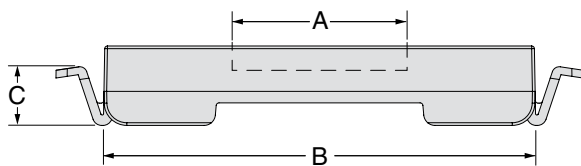


FIG. 31: DIMENSIONS (IN)

| A | B | C |
|-------------------------------|-------------------------------|-------------------------------|
| 1 ⁷ / ₈ | 4 ³ / ₄ | 7 ⁷ / ₈ |

Fig. 32

Universal Shield Strut Adapter

Size Range: 1⁵/₈" x 1⁵/₈" and 1³/₁₆" x 1⁵/₈" strut channel
Material: UV Resistant Polypropylene 20% Glass Filled
Temperature: Operating temperature between -40°F to 178°F (-40°C to 81°C)
Color: Gray
Service: Support of insulated horizontal refrigeration, air conditioning, and plumbing pipe when used with Fig. 30.
Approvals: UL classified for USA (UL-723 (ASTM E84)) and ULC listed for Canada (ULC-S102.2)
Installation: Clip into the Fig. 30 and then clip directly on Anvil-Strut™ AS200 1⁵/₈" x 1⁵/₈" and AS500 1³/₁₆" x 1⁵/₈" strut channel.
Ordering: Specify figure number and size.

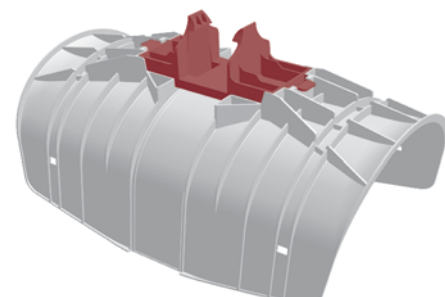
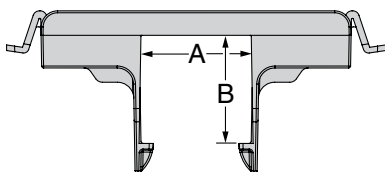
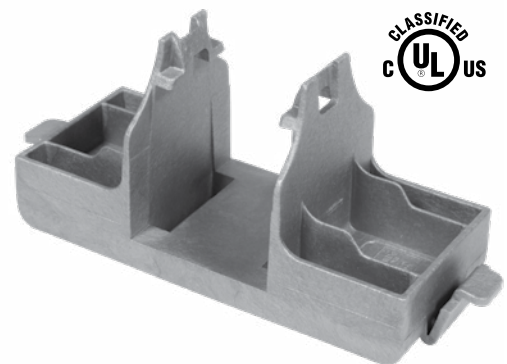


FIG. 32: DIMENSIONS (IN)

| Size | A | B |
|------|-------------------------------|--------------------------------|
| A | 1 ⁵ / ₈ | 1 ³ / ₁₆ |
| B | | 1 ⁵ / ₈ |

Fig. 33

Universal Shield Angle Adapter

Size Range: 1/2" to 2 5/8" Steel Angle

Material: UV Resistant Polypropylene 20% Glass Filled

Temperature: Operating temperature between -40°F to 178°F (-40°C to 81°C)

Color: Gray

Service: Support of insulated horizontal refrigeration, air conditioning, and plumbing pipe when used with Fig. 30.

Approvals: UL classified for USA (UL-723 (ASTM E84)) and ULC listed for Canada (ULC-S102.2)

Installation: Clip into the Fig. 30 and then clip directly on steel angle or C-channel.

Ordering: Specify figure number

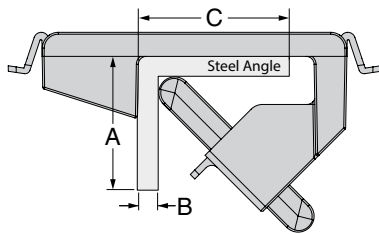


FIG. 33: DIMENSIONS (IN)

| A Min | A Max | B Min | B Max | C Min | C Max |
|-------|-------|-------|-------|-------|-------|
| 1/2 | 2 5/8 | 1/8 | 5/8 | 1/2 | 2 5/8 |

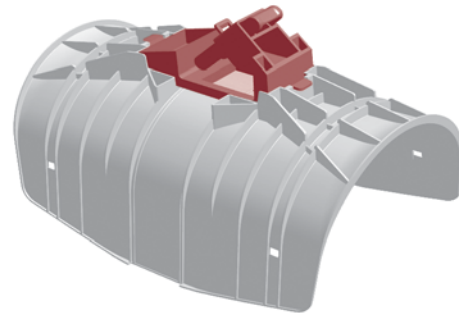
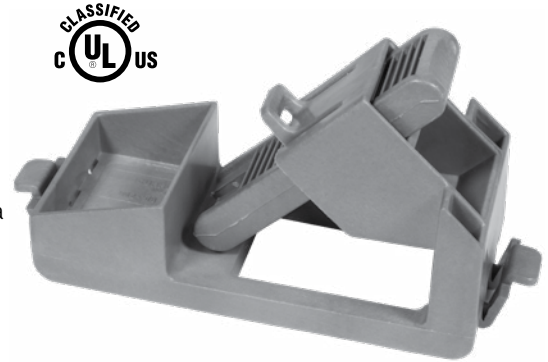


Fig. 34

Universal Shield Strut Stabilisator

Material: UV Resistant Polypropylene 20% Glass Filled

Temperature: Operating temperature between -40°F to 178°F (-40°C to 81°C)

Color: Gray

Service: Support of insulated horizontal refrigeration, air conditioning, and plumbing pipe when used with Fig. 30 & Fig. 31.

Approvals: UL classified for USA (UL-723 (ASTM E84)) and ULC listed for Canada (ULC-S102.2)

Installation: Center under Fig. 30. Clip Fig. 31 over the Strut Stabilisator into the Fig. 30 in order to secure it.

Ordering: Specify figure number and size.

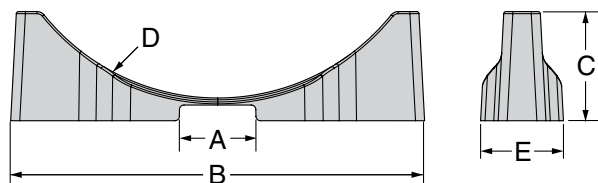


FIG. 34: DIMENSIONS (IN)

| Size | A | B | C | øD | E | Fig. 30 Size |
|------|-------|---------|---|--------|-------|--------------|
| G | 2 1/8 | 10 5/16 | 3 | 10 1/4 | 2 1/4 | G |
| H | | 11 3/8 | | 12 1/4 | | H |

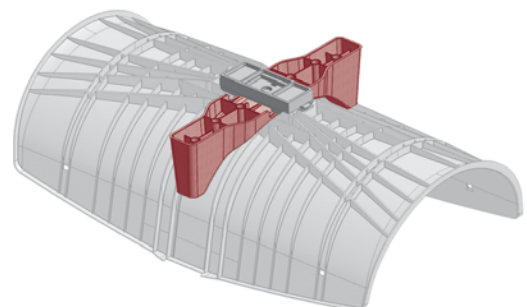
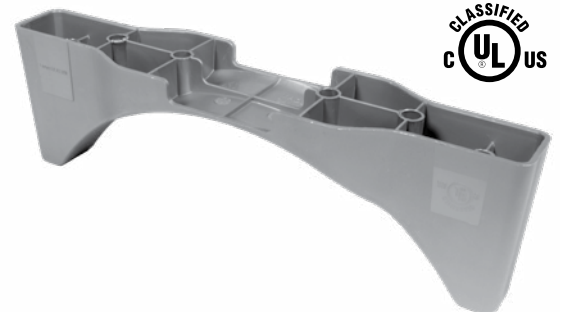


Fig. 35

Material: UV Resistant Polypropylene 20% Glass Filled
Temperature: Operating temperature between -40°F to 178°F (-40°C to 81°C)
Color: Gray
Service: Support of insulated horizontal refrigeration, air conditioning, and plumbing pipe when used with Fig. 30, Fig. 31, and Fig. 34.
Approvals: UL classified for USA (UL-723 (ASTM E84)) and ULC listed for Canada (ULC-S102.2)
Installation: Center under Fig. 30 and Fig. 34. Clip Fig. 31 over the Floor Adapter into the Fig 30 in order to secure it.
Ordering: Specify figure number

Universal Shield Floor Adapter

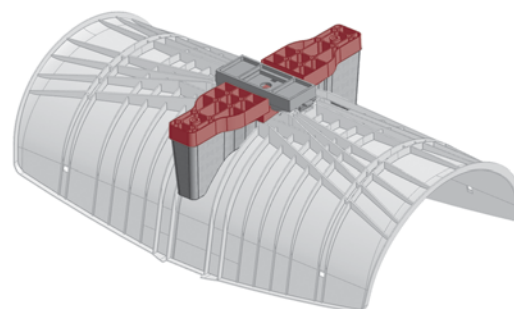
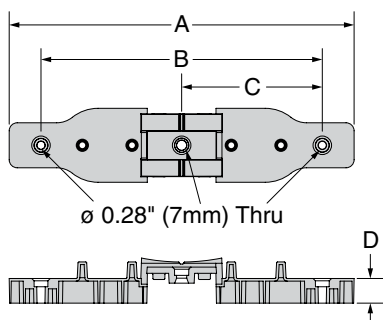
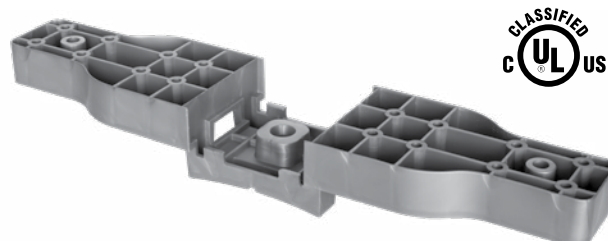


FIG. 35: DIMENSIONS (IN)

| A | B | C | D |
|---------------------------------|-------------------------------|-------------------------------|-------------------------------|
| 10 ⁷ / ₁₆ | 8 ¹ / ₂ | 4 ¹ / ₄ | 3 ³ / ₄ |

Fig. 36

Material: UV Resistant Polypropylene 20% Glass Filled
Temperature: Operating temperature between -40°F to 178°F (-40°C to 81°C)
Color: Gray
Service: Support of insulated horizontal refrigeration, air conditioning, and plumbing pipe when used with Fig. 30
Approvals: UL classified for USA (UL-723 (ASTM E84)) and ULC listed for Canada (ULC-S102.2)
Installation: Clip into the Fig 30 and then clip directly on an I-Beam.
Ordering: Specify figure number

Universal Shield I-Beam Adapter

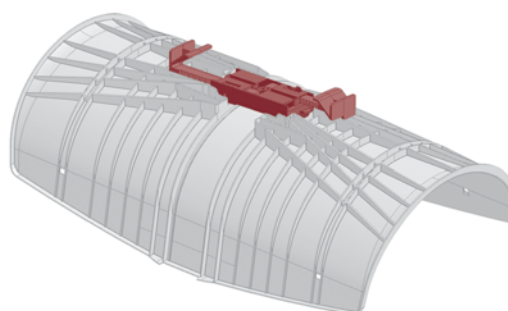
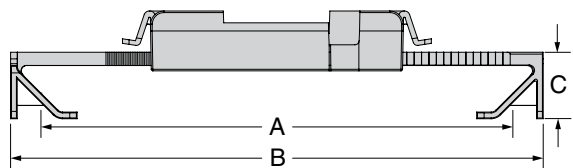
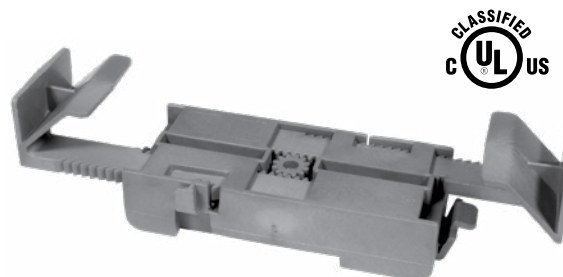


FIG. 36: DIMENSIONS (IN)

| A Min | A Max | B Max | C |
|-------------------------------|-------------------------------|-------|-------------------------------|
| 3 ¹ / ₂ | 8 ⁷ / ₈ | 10 | 3 ³ / ₄ |

Fig. 37

Universal Shield Shock Detector

Size Range: 1.4G, 1.6G, 1.8G Downward Acceleration

Material: UV Resistant Polypropylene 20% Glass Filled. (Carbon Steel Flags)

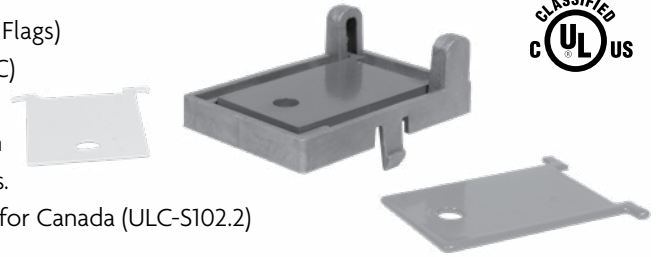
Temperature: Operating temperature between -40°F to 178°F (-40°C to 81°C)

Color: Gray

Service: Magnetic shock detection device provides a visual indication that the piping system has experienced accelerations of various magnitudes.

Approvals: UL classified for USA (UL-723 (ASTM E84)) and ULC listed for Canada (ULC-S102.2)

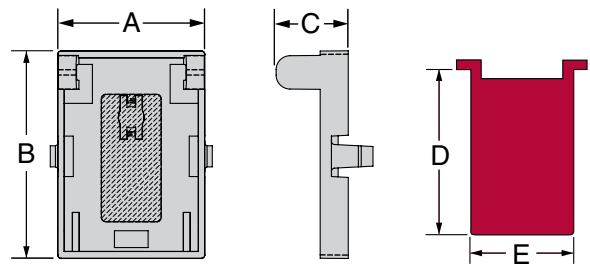
Ordering: Specify figure number



| FIG. 37: FLAG COLOR AND DESIGNED ACCELERATION | |
|---|---------------------------------|
| Flag Color | Downward Allowable Acceleration |
| Yellow | 1.8G |
| Orange | 1.6G |
| Red | 1.4G |

Note: Each unit is supplied with all three interchangeable flags.

| FIG. 37: DIMENSIONS (IN) | | | | |
|--------------------------------|-------------------------------|-------------------------------|--------------------------------|-------------------------------|
| A | B | C | D | E |
| 1 ⁵ / ₁₆ | 1 ⁷ / ₈ | 5 ⁵ / ₈ | 1 ⁷ / ₁₆ | 7 ⁷ / ₈ |

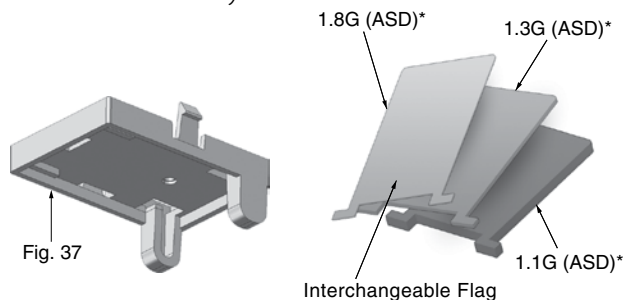


Installation:

STEP 1

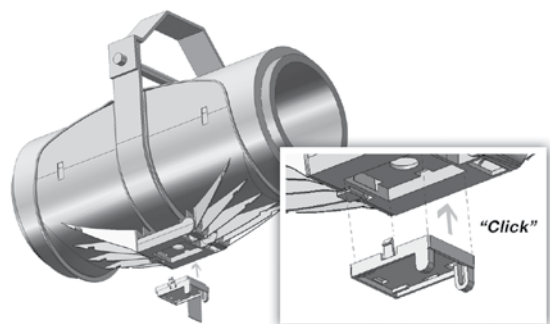
Required installation components

Each flag will trigger at a different shock intensity. Flags are easily interchangeable for different shock tolerance. Various flags thickness for different shock intensity.



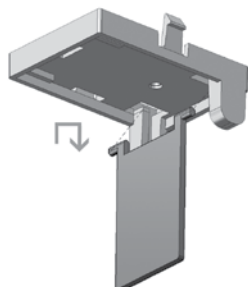
STEP 2

Clip Fig. 37 into Fig. 31 Universal Shield Clevis Adapter



STEP 3

Insert flag into Fig. 37



STEP 4

Move the flag in closed position

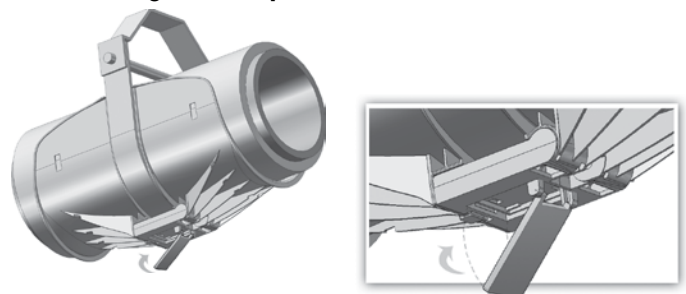


Fig. 38

Universal Shield Insulation Cover

Size Range: Up to 12⁵/₈" O.D. Insulation

Material: UV Resistant Polypropylene 20% Glass Filled

Temperature: Operating temperature between -40°F to 178°F (-40°C to 81°C)

Color: Gray

Approvals: UL classified for USA (UL-723 (ASTM E84)) and ULC listed for Canada (ULC-S102.2)

Installation:

- Cut to desired size.
- Place over insulation and line up mounting notches with Fig. 30.
- Secure insulation shield with tie wraps.

Ordering: Specify figure number and size.

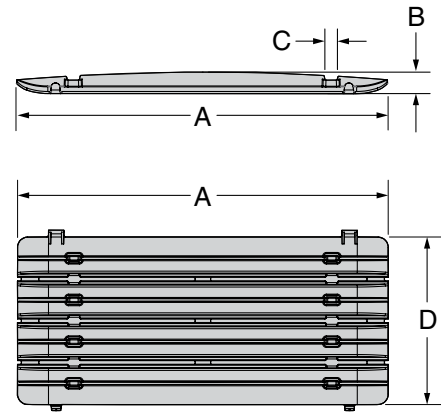
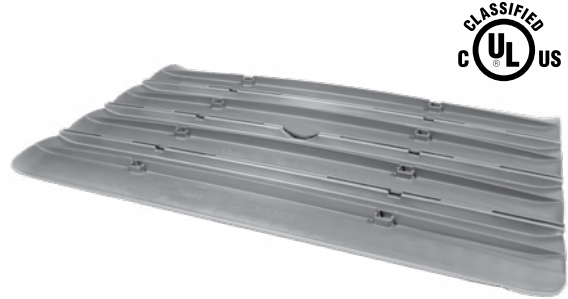


FIG. 38: DIMENSIONS (IN)

| Size | A | B | C | D | Fig. 30 Size |
|------|----|-------------------------------|------------------------------|-------------------------------|--------------|
| A | 12 | ¹³ / ₁₆ | ⁷ / ₁₆ | ⁵ / ₁₆ | A to E |
| B | 18 | ³ / ₄ | | ¹⁰ / ₁₆ | F to H |

Fig. 69 (Formerly Afcon Fig. 300) Adjustable Swivel Ring, Tapped Per NFPA Standards

Size Range: 1/2" through 8"

Material: Carbon steel

Finish: Strap is Pre-Galvanized Zinc Material. Nut is Zinc Plated.

Service: Recommended for suspension of non-insulated **stationary** pipe line.

Maximum Temperature: 450° F

Approvals: Complies with Federal Specification A-A-1192A (Type 10), WW-H-171-E (Type 10), and ANSI/MSS SP-58 (Type 10). UL Listed and FM Approved (Sizes 3/4" - 8").

Features:

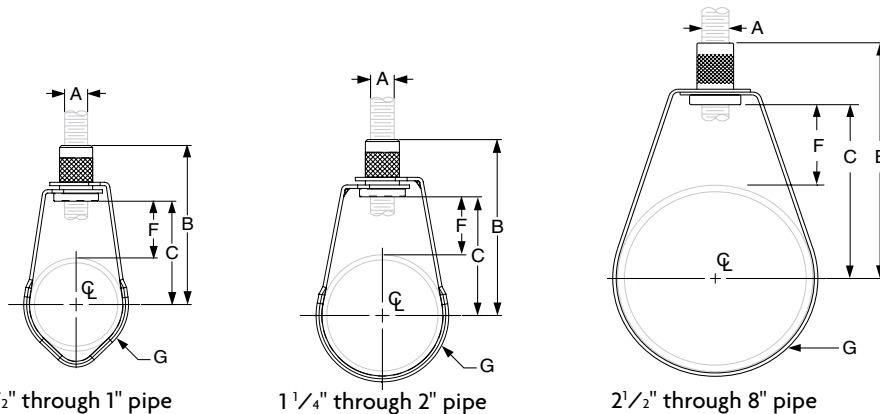
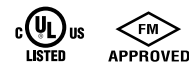
- 1/2" - 2" sizes designed for use with steel and CPVC piping and manufactured with FBC System Compatible oil.
- Threads are countersunk so that they cannot become burred or damaged.
- Knurled swivel nut provides vertical adjustment after piping is in place.
- Captured swivel nut in the 1/2" through 6" sizes. The capture is permanent in the bottom portion of the band, allowing the hanger to be opened during installation if desired, but not allowing the nut to fall completely out.

Ordering: Specify size, figure number and name.

Non-captured nut also available upon request.



1/2" through 2" Size
Rounded Edge Design



2 1/2" through 8" Size

FIG. 69: DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS)

| Pipe Size | Max Load | Weight | Rod Size A | B | C | F | G Width |
|-----------|----------|--------|---------------|--------|--------|-------|------------|
| 1/2 | 300 | 0.10 | 3/8 | 27/8 | 2 | 19/16 | 5/8 |
| 3/4 | | 0.10 | | 23/4 | 17/8 | 19/16 | |
| 1 | | 0.10 | | 29/16 | 111/16 | 1 | |
| 1 1/4 | | 0.10 | | 25/8 | 13/4 | 7/8 | |
| 1 1/2 | | 0.10 | | 23/4 | 17/8 | | |
| 2 | 525 | 0.11 | 33/4 | 23/8 | 11/8 | 3/4 | |
| 2 1/2 | | 0.20 | 4 | 23/4 | 15/16 | | |
| 3 | | 0.20 | 313/16 | 215/16 | 13/16 | | |
| 4 | 650 | 0.30 | 1/2 | 411/16 | 313/16 | 11/16 | 3/4 |
| 5 | 1,000 | 0.54 | | 55/16 | 43/8 | 21/4 | |
| 6 | | 0.65 | | 611/16 | 59/16 | | |
| 8 | | 1.00 | | 89/16 | 79/16 | | |

RING HANGERS

Fig. 69F

Adjustable Swivel Ring, Felt Lined

Size Range: 1/2" through 6" copper tube

Material: Carbon steel and felt with adhesive backing

Finish: Strap is Pre-Galvanized Material. Nut is Zinc Plated.

Service: Recommended for suspension of non-insulated **stationary** copper tubing.

Maximum Temperature: 120° F

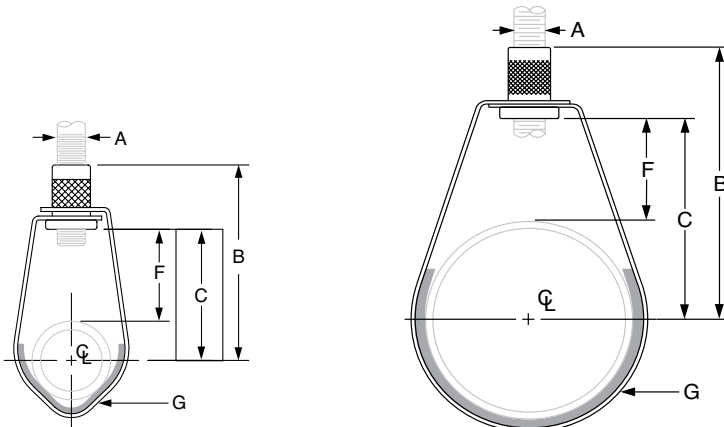
Approvals: Complies with Federal Specification A-A-1192A (Type 10)

WW-H-171-E (Type 10), ANSI/MSS SP-69 and MSS SP-58 (Type 10).

Features:

- The layer of felt separates the copper tubing from the steel ring for electrolytic resistance and also minimizes noise and vibration.
- Threads are countersunk so they cannot become burred or damaged.
- Knurled swivel nut provides vertical adjustment after tubing is in place.
- The captured nut is permanent in the bottom portion of band, allowing the hanger to be opened during installation if desired, but not allowing the nut to fall out.

Ordering: Specify felt ring size, figure number and name.



1/2" & 3/4" tube
1/2" through 1" Felted Ring

1" through 6" tube
1 1/4" through 6" Felted Ring

**FELT LINED RING:
IPS SIZING • DIMENSIONS (IN)**

| Pipe Size | Felted Ring Size |
|-----------|------------------|
| 1/2 | 1/2 - 1 |
| 3/4 | 1 1/4 |
| 1 | 1 1/4 |
| 1 1/4 | 2 |
| 1 1/2 | 2 |
| 2 | 2 1/2 |
| 2 1/2 | 3 |
| 3 | 4 |
| 4 | 5 |
| 5 | 6 |

FIG. 69F: DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS)

| Tube Size | Felted Ring Size | Max Load | Rod Size A | B | C | F | G Width | Weight |
|-----------|------------------|----------|------------|---------|---------|---------|---------|--------|
| 1/2 | 1/2 - 1 | 300 | 3/8 | 2 3/4 | 1 7/8 | 1 3/8 | 5/8 | 0.10 |
| 3/4 | | | | 2 5/8 | 1 11/16 | 1 1/8 | | 0.10 |
| 1 | 2 7/16 | | | 1 9/16 | 1 13/16 | 0.10 | | |
| 1 1/4 | 2 1/2 | | | 1 5/8 | 1 13/16 | 0.10 | | |
| 1 1/2 | 2 5/8 | | | 1 3/4 | 3/4 | 0.10 | | |
| 2 | 3 1/8 | | | 2 1/4 | 1 | 0.10 | | |
| 2 1/2 | 2 1/2 | 525 | 1/2 | 3 7/8 | 2 5/8 | 1 13/16 | 3/4 | 0.20 |
| 3 | 3 3/4 | | | 2 7/8 | 0.20 | | | |
| 4 | 4 | 650 | 1/2 | 4 5/8 | 3 3/4 | 1 9/16 | 3/4 | 0.30 |
| 5 | 5 | | | 5 1/4 | 4 5/16 | | | 1 5/8 |
| 6 | 6 | 1,000 | 1/2 | 6 11/16 | 5 9/16 | 2 3/8 | | 0.65 |

Fig. CT-69

Adjustable Swivel Ring

Size Range: 1/2" through 4"

Material: Carbon steel

Finish: Copper plated

Service: Recommended for suspension of non-insulated **stationary** copper tube.

Approvals: Complies with Federal Specification A-A-1192A (Type 10)

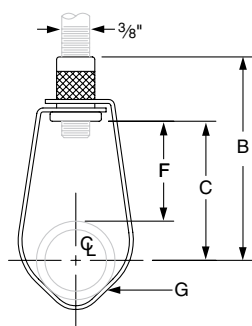
WW-H-171-E (Type 10), ANSI/MSS SP-69 and MSS SP-58 (Type 10).

Features:

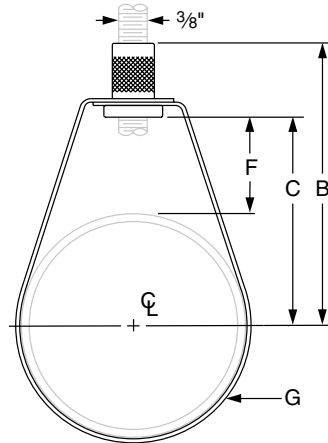
- Threads are countersunk so that they cannot become burred or damaged.
- Knurled swivel nut provides vertical adjustment after piping is in place.
- Captured swivel nut will not fall off.

Ordering: Specify nominal tube size, figure number, name and finish.

Note: Metric nut available upon request.



1/2" through 1 1/4" pipe



1 1/2" through 4" pipe

FIG. CT-69: DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS)

| Tube Size | Max Load | Weight | B | C | F | G Width |
|-----------|----------|--------|---------------------------------|---------------------------------|---------------------------------|---------|
| 1/2 | 300 | 0.10 | 3 | 2 ³ / ₁₆ | 1 ⁷ / ₈ | 5/8 |
| 3/4 | | 0.10 | 2 ¹³ / ₁₆ | 2 | 1 ⁹ / ₁₆ | |
| 1 | | 0.10 | 2 ¹¹ / ₁₆ | 1 ¹³ / ₁₆ | 1 ¹ / ₄ | |
| 1 1/4 | | 0.10 | 2 ¹ / ₂ | 1 ⁵ / ₈ | 1 ¹⁵ / ₁₆ | |
| 1 1/2 | | 0.10 | 2 ¹¹ / ₁₆ | 1 ¹³ / ₁₆ | 1 | |
| 2 | 525 | 0.11 | 3 ⁷ / ₁₆ | 2 ¹ / ₂ | 1 ¹ / ₂ | 3/4 |
| 2 1/2 | | 0.25 | 3 ¹³ / ₁₆ | 2 ¹⁵ / ₁₆ | 1 ¹¹ / ₁₆ | |
| 3 | | 0.27 | 4 ¹ / ₄ | 3 ³ / ₈ | 1 ⁷ / ₈ | |
| 4 | | 0.48 | 4 ³ / ₈ | 3 ¹ / ₂ | 1 ¹ / ₂ | |

Note: Reflects changes in rod diameter from previously published data per recent revisions in MSS-SP-58 & 69

RING HANGERS

Fig. 70 (Formerly Afcon Fig. 303)

Trapeze Pipe Hanger

Size Range: 1½" through 4" Trapeze Pipe

Material: Carbon steel

Finish: Pre-Galvanized per ASTM A653

Service: Allows for the hanging of piping systems between structural attachments.

Approvals: cULus Listed

Ordering: Specify trapeze size, rod size, figure number and finish.

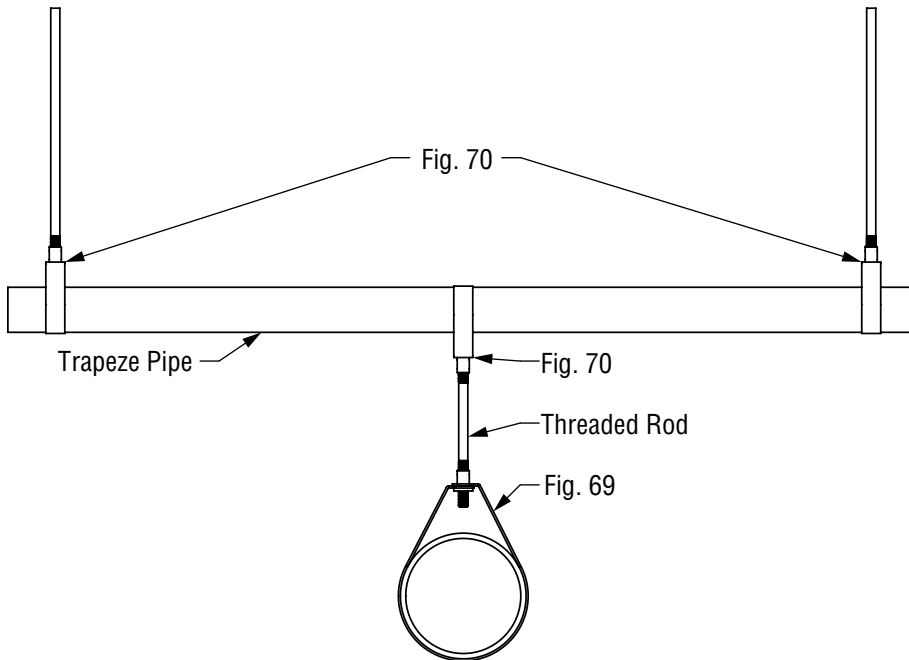


FIG. 70: DIMENSIONS (IN)

| Trapeze Pipe Size | Rod Size | Max Service Pipe Size |
|-------------------|----------|-----------------------|
| 1½ | ¾ | 4 |
| 2 | | |
| 2 | ½ | 8 |
| 2½ | | |
| 3 | | |
| 3½ | | |
| 4 | | |

Fig. 104

Adjustable Swivel Ring, Split Ring Type

Size Range: 3/4" through 8"

Material: Malleable iron, carbon steel

Finish: Plain or Zinc Plated (Hot-Dip Galvanized optional)

Service: Recommended for suspension of non-insulated **stationary** pipe lines.

Maximum Temperature: 450° F

Approvals: Complies with Federal Specification A-A-1192A (Type 6)

WW-H-171-E (Type 6), ANSI/MSS SP-69 and MSS SP-58 (Type 16).

Features:

- Labor-saving features in installation completely outweigh slight additional cost.
- Hanger may be installed prior to suspension of pipe.
- Off-center hinge provides seating for pipe during installation.
- Wedge-type locking pin is inseparably cast into hinged section, sizes 2 1/2" and larger.
- Adjustable swivel ring is self-locking; prevents loosening due to vibration; maintains proper pitch of pipe.
- Wire retaining ring prevents separation of swivel shank from pipe ring before installation.

Ordering: Specify pipe size, figure number, name and finish.

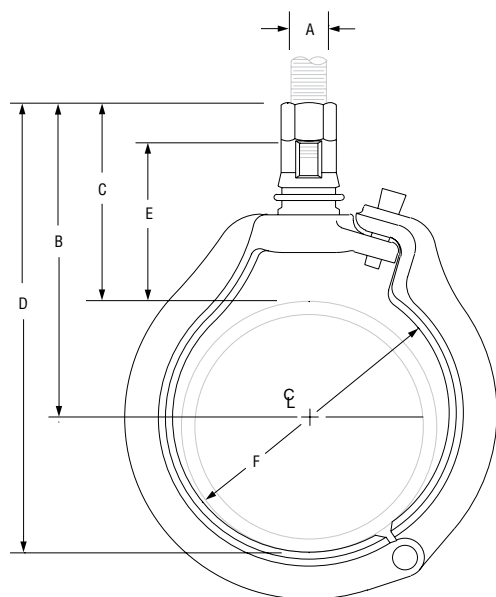


FIG. 104: DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS)

| Pipe Size | Max Load | Weight | Rod Size A | B | C | D | E | Inside Dia. of Ring - F |
|-----------|----------|--------|------------|---------|--------|----------|---------|-------------------------|
| 3/4 | 300 | 0.31 | 3/8 | 2 7/8 | 2 3/8 | 3 7/16 | 1 15/16 | 1 3/16 |
| 1 | | 0.32 | | | 2 1/4 | 3 9/16 | 1 3/4 | 1 7/16 |
| 1 1/4 | | 0.34 | | 3 | 2 3/16 | 3 7/8 | 1 11/16 | 1 13/16 |
| 1 1/2 | | 0.41 | | 3 3/8 | | 4 1/8 | | 2 1/16 |
| 2 | 500 | 0.48 | 1/2 | 3 1/2 | 2 5/16 | 4 11/16 | 1 13/16 | 2 1/2 |
| 2 1/2 | | 0.58 | | 3 15/16 | 2 1/2 | 5 3/8 | 1 7/8 | 3 |
| 3 | | 1.00 | | 4 3/8 | 2 5/8 | 6 1/8 | 2 | 3 3/4 |
| 4 | | 1.70 | | 5 13/16 | 3 3/16 | 8 1/16 | 2 7/8 | 4 13/16 |
| 6 | 1,300 | 3.80 | 3/4 | 7 5/8 | 4 5/16 | 10 15/16 | 3 1/2 | 7 1/16 |
| 8 | 1,800 | 6.10 | 7/8 | 9 3/8 | 4 7/8 | 13 1/2 | 3 7/8 | 9 1/16 |

Fig. 108

Split Pipe Ring

Size Range: $\frac{3}{8}$ " through 8"

Material: Malleable iron

Finish: Plain

Service: Recommended for suspension of non-insulated **stationary** pipe lines or conduit. May be used with rod socket Fig. 110R or turnbuckle adjuster Fig. 114.

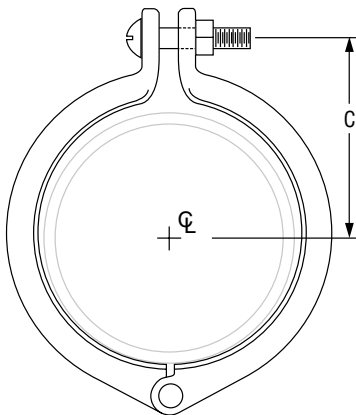
Maximum Temperature: 450° F

Approvals: Complies with Federal Specification A-A-1192A (Type 11) WW-H-171-E (Type 11), ANSI/MSS SP-69 and MSS SP-58 (Type 11).

Features:

- Permits installation before or after pipe is in place.
- Provides economical installation.
- Permits use of universally adaptable parts.

Ordering: Specify pipe size, figure number, name.



**FIGURE 108:
DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS)**

| Pipe Size | Max Load | Weight | C | Bolt Size |
|----------------|----------|--------|------------------|--------------------------------|
| $\frac{3}{8}$ | 200 | 0.06 | $\frac{3}{4}$ | #10 x $\frac{7}{8}$ |
| $\frac{1}{2}$ | | 0.09 | $\frac{15}{16}$ | |
| $\frac{3}{4}$ | 300 | 0.11 | $1\frac{1}{8}$ | |
| 1 | | 0.13 | $1\frac{1}{4}$ | |
| $1\frac{1}{4}$ | | 0.18 | $1\frac{9}{16}$ | |
| $1\frac{1}{2}$ | | 0.26 | $1\frac{11}{16}$ | |
| 2 | 450 | 0.33 | $2\frac{1}{16}$ | $\frac{1}{4}$ x $1\frac{1}{4}$ |
| $2\frac{1}{2}$ | | 0.44 | $2\frac{1}{4}$ | |
| 3 | | 0.63 | $2\frac{3}{4}$ | |
| $3\frac{1}{2}$ | | 0.81 | $3\frac{1}{8}$ | |
| 4 | 520 | 0.97 | $3\frac{5}{8}$ | $\frac{3}{8}$ x 2 |
| 5 | | 1.50 | $4\frac{1}{2}$ | |
| 6 | 1,300 | 2.60 | $5\frac{7}{16}$ | $\frac{1}{2}$ x 2 |
| 8 | 1,800 | 5.20 | $6\frac{3}{8}$ | |

Fig. 138R (Rod Threaded)

Extension Split Pipe Clamp

Size Range: 3/8" through 3"

Material: Malleable iron

Finish: Plain or Zinc Plated (Hot-Dip Galvanized optional)

Service: Recommended for non-insulated **stationary** pipe lines.

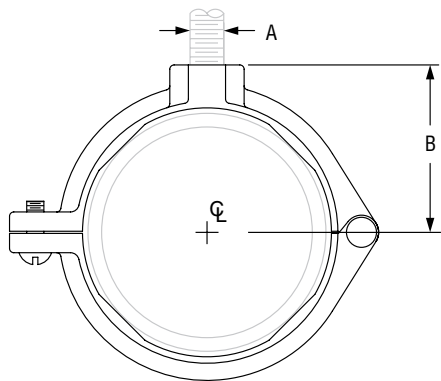
Maximum Temperature: 450° F

Approvals: Complies with Federal Specification A-A-1192A (Type 12) WW-H-171-E (Type 25), ANSI/MSS SP-69 and MSS SP-58 (Type 12).

Features:

- Rapid installation assured by hinged design and single closure screw.
- When used with nipple this clamp is particularly adaptive for use on refrigeration or compressor piping subject to vibration.
- Interior design provides firm grip on pipe.
- Inside of ring tapered to prevent entrapment of condensed moisture.

Ordering: Specify pipe size, figure number, name and finish.



| FIG. 138R: DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS) | | | | |
|--|----------|--------|------------|---------|
| Pipe Size | Max Load | Weight | Rod Size A | B |
| 3/8 | 180 | 0.10 | 3/8 | 13/16 |
| 1/2 | | 0.13 | | 7/8 |
| 3/4 | | 0.14 | | 1 |
| 1 | | 0.16 | | 1 1/8 |
| 1 1/4 | | 0.22 | | 1 5/16 |
| 1 1/2 | | 0.24 | | 1 7/16 |
| 2 | 300 | 0.31 | 1/2 | 1 11/16 |
| 2 1/2 | | 0.60 | | 2 1/8 |
| 3 | | 0.74 | | 2 7/16 |

Fig. CT-138R

Extension Split Tubing Clamp (Rod Threaded)

Size Range: 1/2" through 2"

Material: Malleable iron

Finish: Copper Colored Epoxy

Service: Recommended for suspension of non-insulated **stationary** copper tube.

Approvals: Complies with Federal Specification A-A-1192A (Type 12) WW-H-171-E (Type 25), ANSI/MSS SP-69 and MSS SP-58 (Type 12).

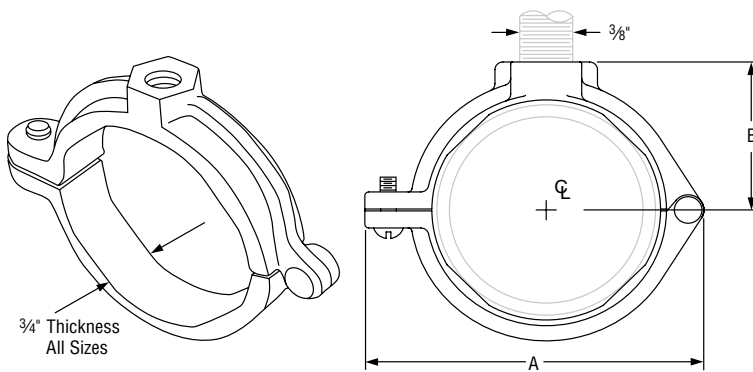
Installation:

- Permanent installation of clamp may be made before the tubing is placed in position.
- Final installation is attained by swinging the lower portion of the hinged clamp up under the tubing and inserting a single screw securely.

Features:

- Hinged design provides for economical installation.
- Designed to provide a tight fit on copper tubing.

Ordering: Specify nominal tube size, figure number and name.



| FIG. CT-138R: DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS) | | | | |
|---|----------|--------|-------|--------|
| Tube Size | Max Load | Weight | A | B |
| 1/2 | 180 | 0.10 | 2 | 3/4 |
| 3/4 | | 0.12 | 2 1/4 | 7/8 |
| 1 | | 0.14 | 2 1/2 | 1 |
| 1 1/4 | | 0.18 | 2 7/8 | 1 1/8 |
| 1 1/2 | | 0.22 | 3 1/4 | 1 1/4 |
| 2 | | 0.36 | 4 | 1 9/16 |

Fig. 100

Extended Pipe Clamp

Size Range: 1/2" through 8"

Material: Carbon steel

Finish: Plain or Hot-Dip Galvanized with Zinc Plated Fasteners

Service: For attachment to structure without use of rods.

Maximum Temperature: Plain 650° F, Galvanized 450° F

Ordering: Specify pipe size, figure number, name and finish.

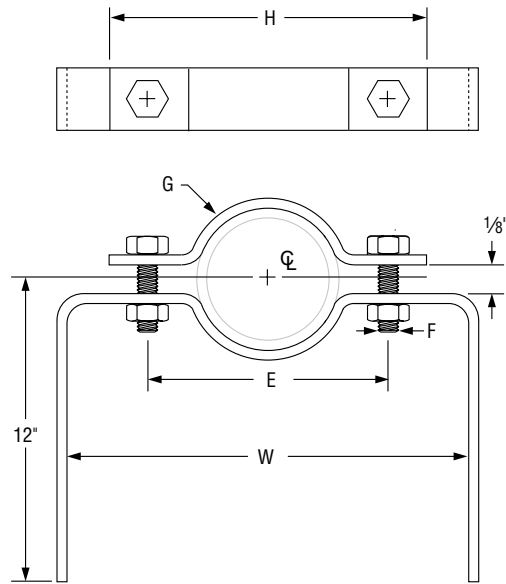


FIG. 100: WEIGHT (LBS) • DIMENSIONS (IN)

| Pipe Size | W | E | F | G Width | H | Weight |
|-----------|--------|--------|-----|---------|--------|--------|
| 1/2 | 5 5/8 | 2 7/8 | 3/8 | 1 | 4 1/4 | 1.85 |
| 3/4 | 5 7/8 | 3 1/8 | | | 4 1/2 | 2.20 |
| 1 | 6 3/8 | 3 5/8 | | | 5 | 2.25 |
| 1 1/4 | 6 7/8 | 4 1/8 | | | 5 1/2 | 2.34 |
| 1 1/2 | 7 1/8 | 4 3/8 | 1/2 | 1 1/4 | 5 3/4 | 2.39 |
| 2 | 8 3/8 | 5 1/8 | | | 6 7/8 | 3.25 |
| 2 1/2 | 8 7/8 | 5 5/8 | | | 7 3/8 | 3.40 |
| 3 | 10 | 6 3/4 | | | 8 1/4 | 3.58 |
| 4 | 10 5/8 | 7 3/8 | 5/8 | 1 1/2 | 9 1/8 | 4.74 |
| 5 | 12 3/8 | 8 3/8 | | | 10 1/8 | 5.09 |
| 6 | 13 1/2 | 9 3/4 | | | 12 | 8.23 |
| 8 | 15 1/2 | 11 3/4 | | | 14 | 9.25 |

Fig. 103

Offset Pipe Clamp

Size Range: 3/4" through 8"

Material: Carbon steel

Finish: Plain or Hot-Dip Galvanized with Zinc Plated Fasteners

Service: For use in supporting piping away from wall or floor.

Maximum Temperature: Plain 650° F, Galvanized 450° F

Ordering: Specify pipe size, figure number, name and finish

Service: For use in supporting horizontal piping away from the wall or floor (not to be used as a riser type support)

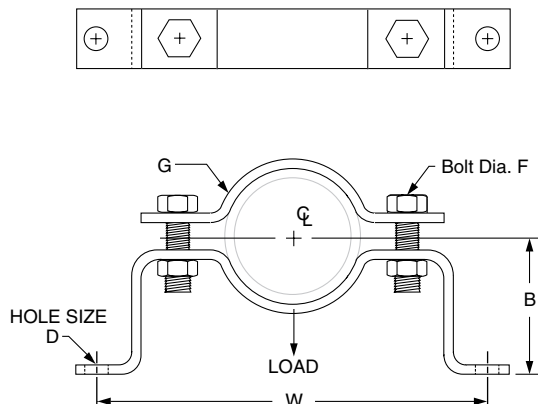


FIG. 103: LOADS (LBS) • WEIGHT (LBS) • DIMENSIONS (IN)

| Pipe Size | Max Load | Weight | W | B | D | Bolt Dia. F | G Width |
|-----------|----------|--------|--------|---------|--------|-------------|---------|
| 3/4 | 190 | 1.50 | 8 3/4 | 2 1/2 | 7/16 | 3/8 | 1 1/4 |
| 1 | | 1.60 | 9 1/4 | 2 5/8 | | | |
| 1 1/4 | | 1.70 | 9 3/4 | 2 13/16 | | | |
| 1 1/2 | | 1.80 | 10 | 2 15/16 | | | |
| 2 | 420 | 2.70 | 11 1/4 | 3 3/16 | 9/16 | 1/2 | 1 1/2 |
| 2 1/2 | | 2.90 | 11 3/4 | 3 7/16 | | | |
| 3 | | 3.20 | 12 7/8 | 3 3/4 | | | |
| 4 | | 4.60 | 13 7/8 | 4 1/4 | | | |
| 5 | 610 | 7.30 | 15 5/8 | 4 3/4 | 1 1/16 | 5/8 | 2 |
| 6 | | 7.80 | 16 3/4 | 5 5/16 | | | |
| 8 | | 9.00 | 18 3/4 | 6 3/16 | | | |

Fig. 212 (Formerly Afcon Fig. 415)

Medium Pipe Clamp

Size Range: 1/2" through 30"

Material: Carbon steel

Finish: Plain or Hot-Dip Galvanized (Hot Dip Galvanized comes with zinc plated hardware.)

Service: Recommended for suspension of cold pipe lines or hot lines where no insulation is required.

Maximum Temperature: Plain 750° F, Galvanized 450° F

Approvals: Complies with Federal Specification A-A-1192A (Type 4)

WW-H-171-E (Type 4), ANSI/MSS SP-69 and MSS SP-58 (Type 4).

UL, ULC Listed and FM Approved (Sizes 3/4" - 8").

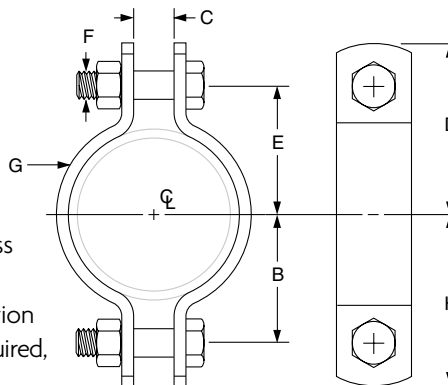
Installation: Normally used with weldless eye nut Fig. 290, page 129 or eye rod.

Features:

- Clamps tightly to pipe.
- Wide range of sizes.
- Equal gap design on many sizes.

Ordering: Specify pipe size, figure number, name and finish.

Note: The "C" gap dimension ensures adequate clearance at the top attachment point for a weldless eye nut or other appropriate rod attachment. This gap may or may not be present on the bottom portion of the clamp. If different loads or dimensions are required, refer to Fig. 42 SD non-standard two bolt pipe clamp.



Note: This picture is representative of a typical Figure 212. Distance between clamp ears beneath pipe may or may not be equal to upper gap.

FIG. 212: DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS)

| Pipe Size | Span Ft. | Max Load For Service Temp | | Weight | B | C | Rod Take Out E | H | D | F | G Width | |
|-----------|----------|---------------------------|--------|--------|--------|--------|----------------|---------|---------|-------|---------|-------|
| | | 650° F | 750° F | | | | | | | | | |
| 1/2 | 7* | 500 | - | 0.29 | 1 | 1/2 | 1 3/16 | 1 17/32 | 1 23/32 | 5/16 | 1 | |
| 3/4 | | | | 0.33 | 1 1/8 | | 1 1/4 | 1 21/32 | 1 25/32 | | | |
| 1 | | | | 0.35 | 1 1/8 | | 1 3/8 | 1 29/32 | 1 29/32 | | | |
| 1 1/4 | | | | 0.38 | 1 1/16 | | 1 5/8 | 1 31/32 | 2 5/32 | | | |
| 1 1/2 | 9* | 800 | - | 0.43 | 1 1/16 | 5/8 | 1 11/16 | 2 3/32 | 2 7/32 | 1/2 | | |
| 2 | 10* | | | 1.10 | 2 1/8 | | 2 1/8 | 2 3/4 | 2 3/4 | | | |
| 2 1/2 | 11* | 1,040 | 930 | 1.20 | 2 5/8 | 3/4 | 2 5/8 | 3 1/4 | 3 1/4 | 3/4 | | |
| 3 | 12* | | | 1.40 | 2 7/8 | | 2 7/8 | 3 1/2 | 3 1/2 | | | |
| 3 1/2 | 13* | | | 1.50 | 3 3/16 | | 3 3/16 | 3 13/16 | 3 13/16 | | | |
| 4 | 14* | | | 1.80 | 3 1/2 | | 3 1/2 | 4 1/4 | 4 1/4 | | | |
| 5 | 16* | 1,615 | 1,440 | 2.60 | 4 3/16 | 1 1/4 | 4 3/16 | 4 15/16 | 4 15/16 | 5/8 | | 1 1/4 |
| 6 | 17* | | | 5.40 | 4 7/8 | | 4 7/8 | 5 3/4 | 5 3/4 | 5/8 | | 1 1/2 |
| 8 | 19* | 2,490 | 2,220 | 6.50 | 6 | 1 1/8 | 6 | 6 7/8 | 6 7/8 | 7/8 | | |
| 10 | 22* | | | 13.60 | 7 1/16 | | 7 1/16 | 8 9/16 | 8 9/16 | | 2 | |
| 12 | 23* | | | 15.20 | 8 1/16 | | 8 1/16 | 9 9/16 | 9 9/16 | | | |
| 14 | 20 | | | 20.50 | 9 1/4 | | 9 1/4 | 10 5/8 | 10 5/8 | | 2 1/2 | |
| 16 | 15 | 22.30 | 10 1/4 | 10 1/4 | 11 5/8 | 11 5/8 | | | | | | |
| 18 | 15 | 3,060 | 2,730 | 31.60 | 11 5/8 | 1 1/4 | 11 5/8 | 13 | 13 | 1 | | |
| 20 | 12 | | | 35.80 | 12 3/4 | 1 3/8 | 12 3/4 | 14 1/8 | 14 1/8 | 1 1/8 | | |
| 24 | 12 | | | 53.10 | 15 1/4 | 1 5/8 | 15 1/4 | 16 7/8 | 16 7/8 | 1 1/4 | | |
| 30 | 9 | 3,500 | 3,360 | 113.90 | 19 | 2 | 19 | 21 1/8 | 21 1/8 | 1 3/4 | 4 | |

Clamps may be furnished with square ends. "Span" represents the maximum recommended distance between hangers on a continuous & straight run of horizontal standard weight steel pipe filled with water. In all cases, verify that chosen location of hangers does not subject hangers to a load greater than the maximum recommended load shown above. For vapor service, the presence of fittings or insulation, and other weights and types of pipe, spans may either increase or decrease. In all cases, verify that chosen location of hanger does not subject hangers to a load greater than the maximum recommended load shown. *Indicates that span represents the maximum span for water filled pipe as given in Table 1 of page 280.

Fig. 212FP

Seismic Bracing Clamp

Size Range: 2 1/2" through 12"

Material: Carbon steel

Finish: Plain or Hot-Dip Galvanized (Hot Dip Galvanized comes with zinc plated hardware.)

Service: For seismic bracing, to be used with Fig. 113 brace fitting. Pipe clamp bolt holes are designed to match holes in brace fitting.

Maximum Temperature: Plain 750° F, Galvanized 450° F

Approvals: Complies with Federal Specification A-A-1192A (Type 4) WW-H-171-E (Type 4), ANSI/MSS SP-69 and MSS SP-58 (Type 4).

Installation: Designed for use with Fig. 113 brace fitting, see page 111.

Ordering: Specify pipe size, figure number, name and finish.

Note: The "C" gap dimension should be used at the upper and lower locations to ensure proper installation of the clamp.

Standard Figure 212 will be furnished for sizes 2 1/2" thru 4".

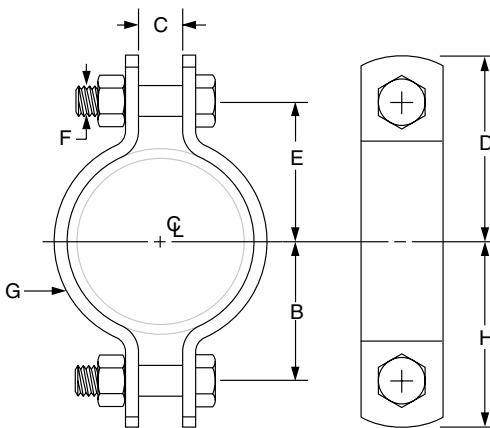


FIG. 212FP: DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS)

| Pipe Size | Max Load For Service Temp | | Weight (lbs) | B | C | Rod Take Out E | H | D | F | G Width |
|-----------|---------------------------|--------|--------------|--------|-------|----------------|---------|---------|-----|---------|
| | 650° F | 750° F | | | | | | | | |
| 2 1/2 | 1,040 | 930 | 1.20 | 2 5/8 | 5/8 | 2 5/8 | 3 1/4 | 3 1/4 | 1/2 | 1 |
| 3 | | | 1.40 | 2 7/8 | | 2 7/8 | 3 1/2 | 3 1/2 | | |
| 3 1/2 | | | 1.50 | 3 3/16 | | 3 3/16 | 3 3/16 | 3 3/16 | | |
| 4 | | | 1.80 | 3 1/2 | | 3 1/2 | 4 1/4 | 4 1/4 | | |
| 5 | | | 2.50 | 4 3/16 | 3/4 | 4 3/16 | 4 15/16 | 4 15/16 | | 1 1/4 |
| 6 | | | 5.20 | 4 7/8 | 1 1/4 | 4 7/8 | 5 3/4 | 5 3/4 | | |
| 8 | | | 6.30 | 6 | | 6 | 6 7/8 | 6 7/8 | | |
| 10 | | | 13.60 | 7 7/16 | 1 | 7 7/16 | 8 9/16 | 8 9/16 | | 2 |
| 12 | | | 15.20 | 8 7/16 | | 8 7/16 | 9 9/16 | 9 9/16 | | |

PIPE CLAMPS

Fig. 216 (Formerly Afcon Fig. 420)

Heavy Pipe Clamp

Size Range: 3" through 42"

Material: Carbon steel

Finish: Plain or Hot-Dip Galvanized (Hot Dip Galvanized comes with zinc plated hardware.)

Service: Recommended for suspension of pipe lines where no insulation is required.

Maximum Temperature: Plain 750° F, Galvanized 450° F

Approvals: Complies with Federal Specification A-A-1192A (Type 4)

WW-H-171-E (Type 4), ANSI/MSS SP-69 and MSS SP-58 (Type 4).

Installation: Normally used with welded eye rod or with weldless eye nut

Fig. 290, see page 129.

Features:

- Designed for heavy load up to 750° F

Ordering: Specify pipe size, figure number, name and finish.

Note: If different loads or dimensions are required, refer to Fig. 42 SD non-standard two bolt pipe clamp.



Note: This picture is representative of a typical Figure 216. Distance between clamp ears beneath pipe may or may not be equal to upper gap.

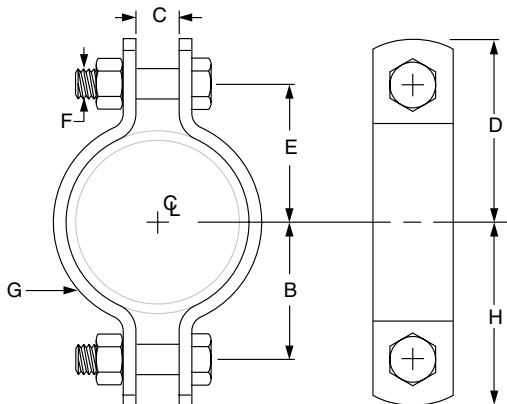


FIG. 216: DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS)

| Pipe Size | Max Load For Service Temp | | Weight | B | C | D | Rod Take Out E | F | G Width | H | |
|-----------|---------------------------|--------|--------|---------------------------------|-------------------------------|--------------------------------|---------------------------------|-------------------------------|--------------------------------|--------------------------------|--------------------------------|
| | 650° F | 750° F | | | | | | | | | |
| 3 | 3,370 | 3,005 | 3.6 | 3 ¹ / ₈ | 1 | 4 | 3 ¹ / ₈ | 3 ³ / ₄ | 2 | 4 | |
| 4 | 3,515 | 3,135 | 5.5 | 3 ³ / ₄ | | 4 ¹ / ₈ | 3 ³ / ₄ | 7 ⁷ / ₈ | | 4 ⁷ / ₈ | |
| 5 | | | 6.3 | 4 ⁷ / ₈ | | 5 ¹ / ₂ | 4 ³ / ₈ | | | 5 ¹ / ₂ | |
| 6 | 4,865 | 4,350 | 11.7 | 5 ¹ / ₄ | 1 ¹ / ₈ | 6 ⁵ / ₈ | 5 ¹ / ₄ | 1 | 2 ¹ / ₂ | 6 ⁵ / ₈ | |
| 8 | | 4,340 | 13.9 | 6 ¹ / ₄ | | 7 ⁵ / ₈ | 6 ¹ / ₄ | | | 7 ⁵ / ₈ | |
| 10 | 6,010 | 5,360 | 22.3 | 7 ¹¹ / ₁₆ | 1 ¹ / ₄ | 9 ¹ / ₁₆ | 7 ¹¹ / ₁₆ | 1 ¹ / ₄ | 3 | 9 ⁹ / ₁₆ | |
| 12 | 8,675 | 7,740 | 38.1 | 9 ¹ / ₄ | 1 ⁵ / ₈ | 10 ⁷ / ₈ | 9 ¹ / ₄ | 1 ¹ / ₂ | | 10 ⁷ / ₈ | |
| 14 | 9,120 | 8,135 | 46.8 | 10 | | 11 ⁷ / ₈ | 10 | | 11 ⁷ / ₈ | 3 ¹ / ₂ | 11 ⁷ / ₈ |
| 16 | | | 51.4 | 11 | | 12 ⁷ / ₈ | 11 | | | | 12 ⁷ / ₈ |
| 18 | 13,800 | – | 130.1 | 14 ¹ / ₂ | 3 | 17 ¹ / ₄ | 14 ¹ / ₂ | 2 | 6 | 17 ¹ / ₄ | |
| 20 | 15,300 | – | 163.6 | 16 | | 18 ³ / ₄ | 16 | | 5 | 18 ³ / ₄ | |
| 24 | 16,300 | – | 215.2 | 18 ¹ / ₂ | 3 ³ / ₄ | 21 ¹ / ₂ | 18 ¹ / ₂ | 2 ¹ / ₄ | 6 | 21 ¹ / ₂ | |
| 28 | 18,000 | – | 302.8 | 20 ¹ / ₂ | | 23 ¹ / ₂ | 20 ¹ / ₂ | | 8 | 23 ¹ / ₂ | |
| 30 | 20,500 | – | 365.4 | 22 ¹ / ₂ | 3 ¹ / ₂ | 26 | 22 ¹ / ₂ | 2 ¹ / ₂ | 7 | 26 | |
| 32 | 23,750 | – | 431.7 | 23 ¹ / ₂ | | 27 | 23 ¹ / ₂ | | 8 | 27 | |
| 34 | 25,000 | – | 533.8 | 25 | | 28 ¹ / ₂ | 25 | | | 28 ¹ / ₂ | |
| 36 | 28,000 | – | 575.1 | 26 ¹ / ₂ | | 30 ¹ / ₄ | 26 ¹ / ₂ | | | | 30 ¹ / ₄ |
| 42 | 35,000 | – | 915.7 | 30 | | 33 ³ / ₄ | 30 | | 2 ³ / ₄ | 10 | 33 ³ / ₄ |

Fig. 224

Alloy Steel Pipe Clamp

Size Range: 4" through 16"

Material: Chrome molybdenum steel except U-bolt which is stainless steel.

Service: Recommended for suspension of high temperature pipe requiring up to 4" of insulation.

Maximum Temperature: 1,050° F

Approvals: Complies with Federal Specification A-A-1192A (Type 2), WW-H-171-E (Type 2), and MSS SP-58 (Type 2).

Installation: Normally used with welded eye rod Fig. 278 or weldless eye nut Fig. 290.

Features:

- Designed for the support of loads at temperatures up to 1,050° F.
- Designed to satisfy most critical engineering specifications.
- Yoke has rugged cross sectional area, eliminating high stress conditions.
- When used on pipe with 4" of insulation the top bolt is outside of the insulation.

Ordering: Specify pipe size, figure number and name.



Cast



Fabricated

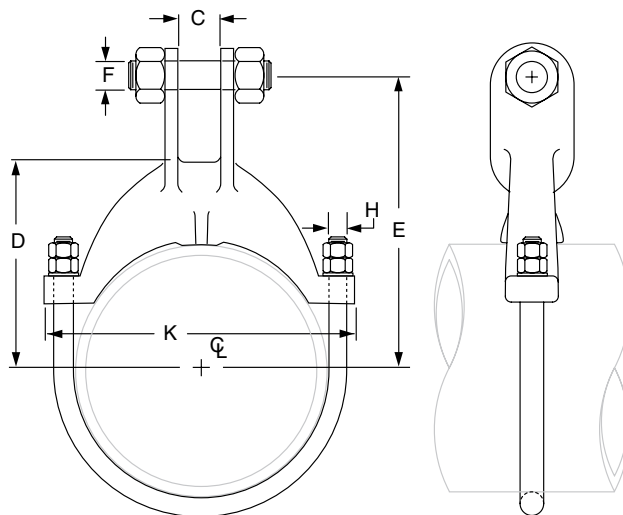


FIG. 224: DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS)

| Pipe Size | Max Load ■ | | | | Weight | C | D | Rod Take Out E | F | H | K |
|-----------|------------|--------|----------|----------|--------|---------------------------------|---------------------------------|--------------------------------|-------------------------------|-------------------------------|--------------------------------|
| | 750° F | 950° F | 1,000° F | 1,050° F | | | | | | | |
| 4 | 3,780 | 3,300 | 2,770 | 1,890 | 4.0 | 1 ¹ / ₁₆ | 3 ³ / ₈ | 6 ³ / ₄ | 7 ⁷ / ₈ | 1 ¹ / ₂ | 6 ¹ / ₂ |
| 6 | 6,060 | 5,290 | 4,440 | 3,030 | 7.5 | 1 ⁷ / ₁₆ | 5 ⁵ / ₁₆ | 8 ⁵ / ₁₆ | 1 | 5 ⁵ / ₈ | 9 ¹ / ₈ |
| 8 | | | | | | | 6 ¹ / ₁₆ | 9 ⁹ / ₁₆ | | | 11 ¹ / ₈ |
| 10 | 9,060 | 7,910 | 6,640 | 4,420 | 15.8 | | 8 ³ / ₈ | 10 ⁷ / ₈ | 1 ¹ / ₈ | 3 ³ / ₄ | 13 ³ / ₈ |
| 12 | 12,570 | 10,980 | 9,015 | 6,010 | 24.3 | 1 ¹⁵ / ₁₆ | 10 ¹⁰ / ₈ | 12 ⁷ / ₈ | 1 ¹ / ₂ | 7 ⁷ / ₈ | 16 ¹ / ₈ |
| 14 | | | | | 26.3 | | 11 ¹ / ₈ | 13 ³ / ₈ | | | 17 ⁷ / ₈ |
| 16 | | | | | 31.0 | | 12 ¹ / ₄ | 15 | | | 19 ³ / ₈ |

■ Based on the allowable stresses shown in the ASME Code for Pressure Piping. Over tightening of nuts may overstress U-bolts reducing the load rating. Installation tag attached to clamp gives proper nut tightening.

Fig. 246

Heavy Duty Alloy Steel Pipe Clamp

Size Range: 10" through 24"

Material: Chrome molybdenum steel except U-bolt which is stainless steel.

Service: Recommended for suspension of high temperature pipe requiring up to 6" of insulation.

Maximum Temperature: 1,075° F

Approvals: Complies with Federal Specification A-A-1192A (Type 2), WW-H-171-E (Type 2), and MSS SP-58 (Type 2).

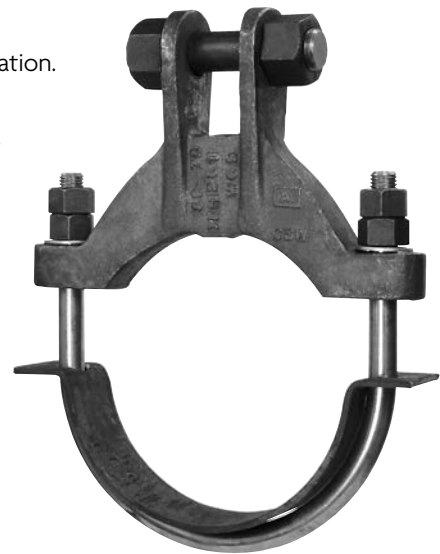
Installation: Normally used with welded eye rod Fig. 278 or weldless eye nut Fig. 290.

Features:

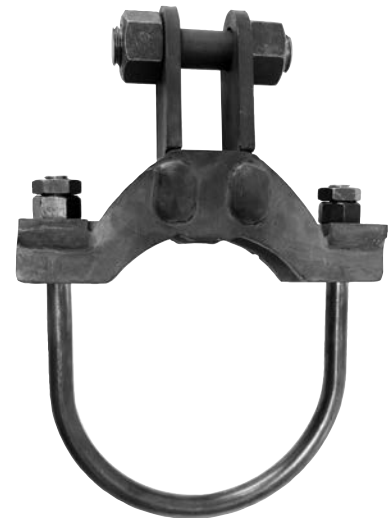
- Designed for the support of heavy loads at high temperatures.
- Clamp with filler plate will snugly hold pipe of non-standard size.
- Alloy load distribution strap provided.
- When used on pipe with 6" of covering, the top bolt is outside of the insulation.

Ordering: Specify nominal pipe size and exact O.D. of pipe, figure number, name.

Special alloy filler plates will be provided, at an extra charge, when the O.D. of the pipe size is other than standard. Installation instructions are attached to the clamp when the filler plates are required.



Cast



Fabricated

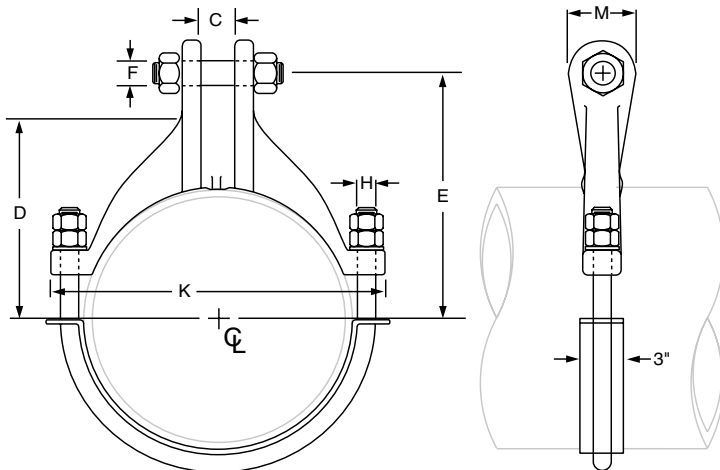


FIG. 246: DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS)

| Pipe Size | Used on O.D. pipe size | Max Load ■ | | | | Weight* | C | D | Rod Take Out E | F | H | K | M |
|-----------|---|------------|----------|----------|----------|---------|----|--------------------------------|--------------------------------|----|----|--------------------------------|----|
| | | 950° F | 1,000° F | 1,050° F | 1,075° F | | | | | | | | |
| 10 | 8¾ - 10 ¹³ / ₁₆ | 13,500 | 11,780 | 7,850 | 6,120 | 42.0 | 2 | 9¾ | 12 | 1½ | 1 | 15¾ | 3¼ |
| 12 | 10 ⁷ / ₈ - 12 ¹³ / ₁₆ | 16,500 | 14,910 | 9,940 | 7,750 | 58.0 | 2¼ | 10¾ | 13¾ | 1½ | 1¼ | 17 ⁷ / ₈ | 4 |
| 14 | 12 ⁷ / ₈ - 14 ¹ / ₁₆ | | | | | | | 11½ | 14½ | | | 19 ¹ / ₈ | |
| 16 | 14 ¹ / ₈ - 16 ¹ / ₁₆ | | | | | | | 13 ³ / ₈ | 16 ³ / ₈ | | | 21 ¹ / ₈ | |
| 18 | 16 ¹ / ₈ - 18 ¹ / ₁₆ | 19,000 | 18,410 | 12,270 | 9,570 | 94.0 | 2½ | 14½ | 18¼ | 2 | 1¼ | 24 ¹ / ₈ | 4½ |
| 20 | 18 ¹ / ₈ - 20 ¹ / ₁₆ | | | | | | | 15¾ | 19½ | | | 26 ¹ / ₈ | |
| 24 | 20 ¹ / ₈ - 24 ¹ / ₁₆ | 25,000 | 22,280 | 14,850 | 11,580 | 167.0 | 3 | 18¼ | 22 | 2¼ | 1¾ | 30¾ | 6 |

■ Based on the allowable stresses shown in the ASME Code for Pressure Piping. Over tightening of nuts may overstress U-bolts reducing the load rating. Installation tag attached to clamp gives proper nut tightening. * This weight does not include filler plates required on non-standard pipe sizes

Fig. 295 (Formerly Afcon Fig. 425)

Double Bolt Pipe Clamp

Size Range: 3/4" through 36"

Material: Carbon steel

Finish: Plain or Hot-Dip Galvanized with Zinc Plated Bolts & Nuts

Service: Recommended for suspension of pipe requiring insulation within the limitation of temperature and loads shown below.

Maximum Temperature: Plain 750° F, Galvanized 450° F

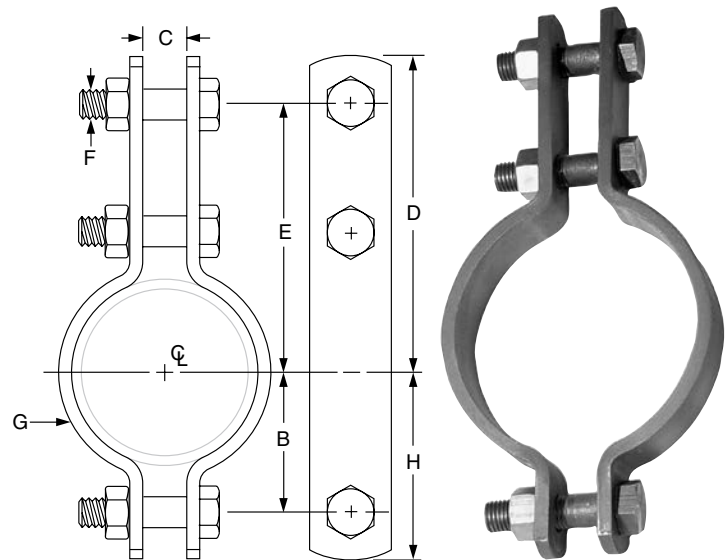
Approvals: Complies with Federal Specification A-A-1192A (Type 3), WW-H-171-E (Type 3), ANSI/MSS SP-69 and MSS SP-58 (Type 3).

Installation: Attachment to the clamp may be made with a welded eye rod Fig. 278, page 124 or the weldless eye nut Fig. 290, see page 129.

Features:

- Sizes 6" and above accommodate up to 4" thick insulation.
- Figure 41SD will accommodate larger insulation thicknesses, loads and dimensions.

Ordering: Specify pipe size, figure number, name and finish.



Note: This picture is representative of a typical Figure 295. Distance between clamp ears beneath pipe may or may not be equal to upper gap.

FIG. 295: DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS)

| Pipe Size | Max Span Ft. | Max Load For Service Temp. | | Weight | B | C | D | Rod Take Out E | F | G Width | H | | |
|-----------|--------------|----------------------------|--------|--------|---------|--------|---------|----------------|--------|---------|----------|-------|--------|
| | | 650° F | 750° F | | | | | | | | | | |
| 3/4 | 7* | 950 | - | 0.7 | 1 5/16 | 5/8 | 2 7/8 | 2 7/16 | 3/8 | 1 | 1 3/8 | | |
| 1 | | | | 0.8 | 1 1/8 | | 3 | 2 9/16 | | | 1 1/2 | | |
| 1 1/4 | | | | 0.8 | 1 1/4 | | 3 1/8 | 2 11/16 | | | 1 11/16 | | |
| 1 1/2 | 9* | 1,545 | 1,380 | 2.3 | 1 13/16 | 1 1/16 | 4 7/8 | 4 1/8 | 5/8 | 1 1/4 | 2 3/8 | | |
| 2 | | | | 2.6 | 2 1/8 | | 5 3/4 | 5 | | | 2 11/16 | | |
| 2 1/2 | | | | 1.97 | 2 5/8 | | 6 | 5 3/8 | | | 3 1/4 | | |
| 3 | 12* | 2,500 | 2,230 | 2.17 | 2 7/8 | 5/8 | 6 5/8 | 6 | 1/2 | 1 | 3 1/2 | | |
| 4 | | | | 6.7 | 3 3/8 | | 7 5/8 | 6 1/2 | | | 4 1/2 | | |
| 5 | | | | 7.0 | 3 15/16 | | 8 1/8 | 7 | | | 5 | | |
| 6 | 17* | 2,865 | 2,555 | 7.31 | 4 7/8 | 1 1/4 | 9 3/8 | 8 1/2 | 3/4 | 2 | 5 3/4 | | |
| 8 | | | | 8.33 | 6 | | 10 3/8 | 9 1/2 | | | 6 7/8 | | |
| 10 | | | | 19.8 | 6 7/8 | | 11 7/8 | 10 7/16 | | | 8 1/4 | | |
| 12 | 23" | 3,240 | 2,890 | 22.3 | 7 7/8 | 1 1/2 | 12 7/8 | 11 7/16 | 1 | 2 1/2 | 9 1/4 | | |
| 14 | | | | 37.7 | 9 1/16 | | 14 5/16 | 12 11/16 | | | 10 11/16 | | |
| 16 | | | | 41.4 | 10 1/16 | | 15 5/16 | 13 11/16 | | | 11 11/16 | | |
| 18 | 15 | 4,300 | 3,835 | 44.9 | 11 1/16 | 2 | 16 5/16 | 14 11/16 | 1 1/4 | 3 | 12 11/16 | | |
| 20 | | | | 57.3 | 12 3/8 | | 17 5/8 | 15 5/8 | | | 14 | | |
| 24 | | | | 65.9 | 14 3/8 | | 19 3/8 | 17 7/8 | | | 16 | | |
| 28 | - | 6,000 | - | 112.3 | 17 1/2 | 2 1/4 | 24 1/4 | 21 3/4 | 1 1/4 | 4 | 20 | | |
| 30 | 9 | 7,500 | - | 150.0 | 18 1/2 | | 2 1/2 | 26 1/8 | | 23 3/8 | 1 3/8 | 5 | 21 1/4 |
| 32 | - | 8,250 | - | 193.3 | 19 5/8 | | | 28 | | 25 | | 1 1/2 | 6 |
| 34 | - | 9,800 | - | 248.8 | 21 1/2 | 3 | | 31 1/4 | 27 3/4 | 1 3/4 | | 5 | 25 |
| 36 | - | 10,500 | - | 257.5 | 22 1/2 | | 32 1/4 | 28 3/4 | 1 3/4 | | 5 | | 26 |

Clamps may be furnished with square ends. "Span" represents the maximum recommended distance between hangers on a continuous and straight run of horizontal standard weight steel pipe filled with water. In all cases, verify that chosen location of hangers does not subject hangers to a load greater than the maximum recommended load shown above. *Indicates that span represents the maximum span for water filled pipe as given in Table 1 of page 280. For vapor service, the presence of fittings or insulation, and other weights and types of pipe, spans may either increase or decrease. In all cases, verify that chosen location of hanger does not subject hangers to a load greater than the maximum recommended load shown.

Fig. 295A

Alloy Double Bolt Pipe Clamp

Size Range: 1½" through 24"

Material: Chrome molybdenum steel (ASTM A 387 Grade 22).

Service: Recommended for suspension of high temperature pipe requiring insulation.

Maximum Temperature: 1,050° F

Approvals: Complies with Federal Specification A-A-1192A (Type 3)

WW-H-171-E (Type 3), ANSI/MSS SP-69 and MSS SP-58 (Type 3).

Features:

- Sizes 6" and above accommodate up to 4" thick insulation.
- Figure 41SD will accommodate larger insulation thicknesses, loads and dimensions.

Ordering: Specify pipe size, figure number and name.

Note: Galvanizing is not recommended for alloy products.



Note: This picture is representative of a typical Figure 295A. Distance between clamp ears beneath pipe may or may not be equal to upper gap.

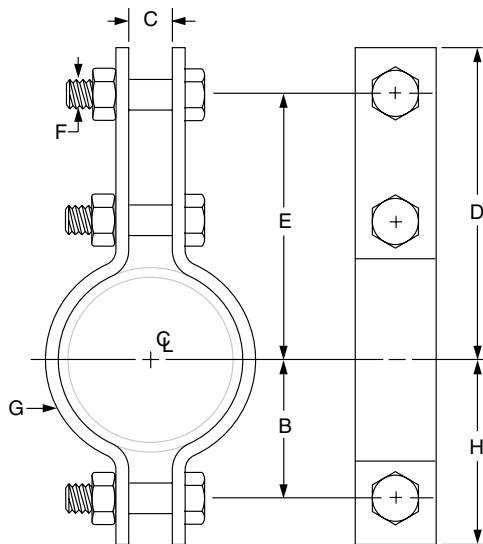


FIG. 295A: DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS)

| Pipe Size | Max Load ■ For Service Temp | | | | Weight | B | C | D | Rod Take Out E | F | G Width | H | |
|-----------|--------------------------------|--------|----------|----------|--------|---------------------------------|--------------------------------|----------------------------------|----------------------------------|-------------------------------|-------------------------------|----------------------------------|-------------------------------|
| | 650° F | 750° F | 1,000° F | 1,050° F | | | | | | | | | |
| 1½ | 1,545 | 1,410 | 1,000 | 745 | 2.3 | 1 ¹³ / ₁₆ | 1 ¹ / ₁₆ | 4 ⁷ / ₈ | 4 ¹ / ₈ | 5 ⁵ / ₈ | 1 ¹ / ₄ | 2 ³ / ₈ | |
| 2 | | | | | 2.6 | 2 ¹ / ₈ | | 5 ⁵ / ₈ | 5 ¹ / ₈ | | | 2 ¹¹ / ₁₆ | |
| 2½ | | | | | 2.7 | 2 ⁵ / ₁₆ | | 6 ¹ / ₈ | 5 ³ / ₈ | | | 2 ⁵ / ₁₆ | |
| 3 | | | | | 3.0 | 2 ³ / ₄ | | 6 ¹¹ / ₁₆ | 5 ¹⁵ / ₁₆ | | | 3 ¹ / ₂ | |
| 4 | | | | | 6.7 | 3 ³ / ₈ | | 7 ⁵ / ₈ | 6 ¹ / ₂ | | | 4 ¹ / ₂ | |
| 5 | 2,500 | 2,290 | 1,625 | 1,200 | 7.0 | 3 ¹⁵ / ₁₆ | 8 ¹ / ₈ | 7 | 3 ³ / ₄ | 2 | 5 | | |
| 6 | 2,865 | 2,620 | 1,860 | 1,380 | 11.5 | 4 ³ / ₄ | 1 ⁷ / ₁₆ | 9 ¹⁵ / ₁₆ | 8 ⁹ / ₁₆ | 7 ⁷ / ₈ | 2 ¹ / ₂ | 6 ¹ / ₈ | |
| 8 | | | | | 13.2 | 5 ³ / ₄ | | 10 ¹⁵ / ₁₆ | 9 ⁹ / ₁₆ | | | 7 ⁷ / ₈ | |
| 10 | | | | | 19.8 | 7 ¹ / ₁₆ | | 12 | 10 ⁵ / ₈ | | | 1 | 8 ³ / ₄ |
| 12 | | | | | 22.3 | 8 ¹ / ₁₆ | | 13 | 11 ⁵ / ₈ | | | 9 ⁵ / ₁₆ | |
| 14 | 4,300 | 3,915 | 2,795 | 2,060 | 37.7 | 9 ¹ / ₁₆ | 2 | 14 ⁵ / ₁₆ | 12 ¹¹ / ₁₆ | 1 ¹ / ₄ | 3 | 10 ¹¹ / ₁₆ | |
| 16 | | | | | 41.4 | 10 ¹ / ₁₆ | | 15 ⁵ / ₁₆ | 13 ¹¹ / ₁₆ | | | 11 ¹¹ / ₁₆ | |
| 18 | | | | | 44.9 | 11 ¹ / ₁₆ | | 16 ⁵ / ₁₆ | 14 ¹¹ / ₁₆ | | | 12 ¹¹ / ₁₆ | |
| 20 | | | | | 57.3 | 12 ³ / ₈ | | 17 ¹ / ₂ | 15 ⁷ / ₈ | | | 14 | |
| 24 | | | | | 65.9 | 14 ³ / ₈ | | 19 ¹ / ₂ | 17 ⁷ / ₈ | | | 1 ³ / ₈ | 16 |

■ Based on the allowable stresses shown in the ASME Code for Pressure Piping.

Fig 295H

Heavy Duty Double Bolt Pipe Clamp

Size Range: 6" through 36"

Material: Carbon steel

Finish: Plain or Hot-Dip Galvanized with Zinc Plated Bolts & Nuts

Service: Recommended for suspension of pipe requiring insulation within the limitation of temperature and loads shown below.

Maximum Temperature: Plain 750° F, Galvanized 450° F

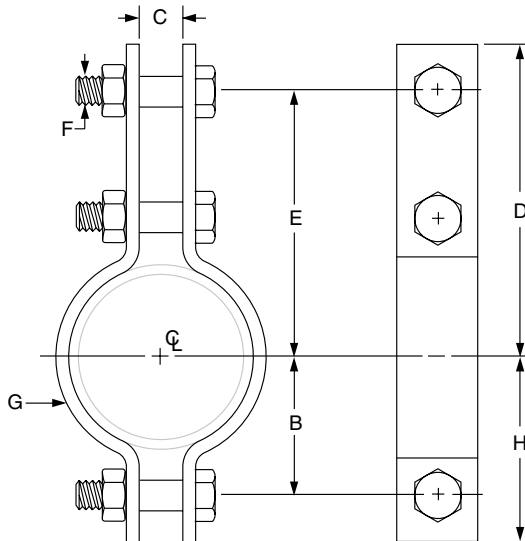
Approvals: Complies with Federal Specification A-A-1192A (Type 3)

WW-H-171-E (Type 3), ANSI/MSS SP-69 and MSS SP-58 (Type 3).

Features:

- Accommodates up to 4" thick insulation.
- Figure 41SD will accommodate larger insulation thicknesses, loads and dimensions.

Ordering: Specify pipe size, figure number, name and finish.



Note: This picture is representative of a typical Figure 295H. Distance between clamp ears beneath pipe may or may not be equal to upper gap.

FIG 295H: DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS)

| Pipe Size | Max Load For Service Temp | | Weight | B | C | D | Rod Take Out E | F | G Width | H |
|-----------|---------------------------|--------|--------|--------------------------------|-------------------------------|----------------------------------|---------------------------------|---------------------------------|-------------------------------|--------------------------------|
| | 650° F | 750° F | | | | | | | | |
| 6 | 3,500 | 3,125 | 12.0 | 4 ³ / ₄ | 1 ³ / ₄ | 10 ¹³ / ₁₆ | 8 ¹⁵ / ₁₆ | 1 | 2 ¹ / ₂ | 6 |
| 8 | 4,800 | 4,285 | 18.5 | 6 | 2 | 11 ³ / ₈ | 10 ¹ / ₈ | 1 ¹ / ₈ | | 7 ¹ / ₄ |
| 10 | 5,500 | 4,910 | 30.3 | 7 ¹ / ₄ | 2 ¹ / ₄ | 13 ³ / ₈ | 11 ³ / ₈ | 1 ¹ / ₄ | 3 ¹ / ₂ | 9 |
| 12 | 7,000 | 6,250 | 42.0 | 8 ⁵ / ₈ | 2 ¹ / ₂ | 14 ⁵ / ₁₆ | 12 ⁹ / ₁₆ | 1 ³ / ₈ | | 10 ³ / ₈ |
| 14 | 9,500 | 8,485 | 60.0 | 9 ⁵ / ₈ | | 3 | 15 ¹ / ₂ | 13 ¹ / ₂ | 1 ¹ / ₂ | 4 |
| 16 | 10,000 | 8,930 | 80.0 | 10 ⁷ / ₈ | 3 ¹ / ₂ | | 17 ⁷ / ₈ | 14 ⁷ / ₈ | 1 ³ / ₄ | 4 ¹ / ₂ |
| 18 | 13,800 | 12,325 | 115.0 | 12 ¹ / ₂ | | 4 | 18 ¹ / ₄ | 16 ¹ / ₄ | 2 | 4 |
| 20 | 15,300 | 13,665 | 140.0 | 13 ¹ / ₂ | 3 ¹ / ₂ | | 19 ³ / ₄ | 17 ¹ / ₄ | | 2 |
| 24 | 16,300 | 14,555 | 190.0 | 15 ¹ / ₂ | | 4 | 22 ⁵ / ₁₆ | 19 ⁵ / ₁₆ | 2 ¹ / ₄ | |
| 28 | 18,000 | – | 354.0 | 18 ⁷ / ₈ | 4 ¹ / ₄ | | 31 ³ / ₄ | 27 ¹ / ₄ | | 2 ¹ / ₄ |
| 30 | 20,500 | – | 406.0 | 19 ⁷ / ₈ | | 4 ¹ / ₄ | 32 ³ / ₄ | 28 ¹ / ₄ | 2 ¹ / ₄ | |
| 32 | 23,750 | – | 555.0 | 21 ³ / ₄ | 4 ¹ / ₄ | | 36 | 31 | | 2 ¹ / ₂ |
| 34 | 25,000 | – | 604.0 | 23 ³ / ₈ | | 4 ¹ / ₂ | 37 ¹ / ₂ | 32 ¹ / ₂ | 2 ¹ / ₂ | |
| 36 | 28,000 | – | 678.0 | 24 ³ / ₈ | 4 ¹ / ₂ | | 40 ¹ / ₄ | 34 ³ / ₄ | | 2 ³ / ₄ |

Clamps may be furnished with square ends.



RISER CLAMPS

Fig. 40

Riser Clamp – Standard

Size Range: 2" through 24"

Material: Carbon steel (CS), Alloy (A), or Stainless Steel (SS)

Finish: Plain or Hot-Dip Galvanized with Zinc Plated Fasteners

Maximum Temperature: Galvanized 450° F, 650° F (CS), 950° F (A) and 1,000° F (SS)

Service: Riser clamps are used for the support of vertical piping. Load is carried by shear lugs which are welded to the pipe. Shear lugs provided upon request. Local pipe wall stress evaluation available upon request.

Approvals: Complies with Federal Specification A-A-1192A (Type 42), ANSI/MSS SP-69 and MSS SP-58 (Type 42).

Ordering: Specify pipe size, material, figure number, name and finish.

Note: If different loads or dimensions are required, refer to Fig. 40 SD special design riser clamp.

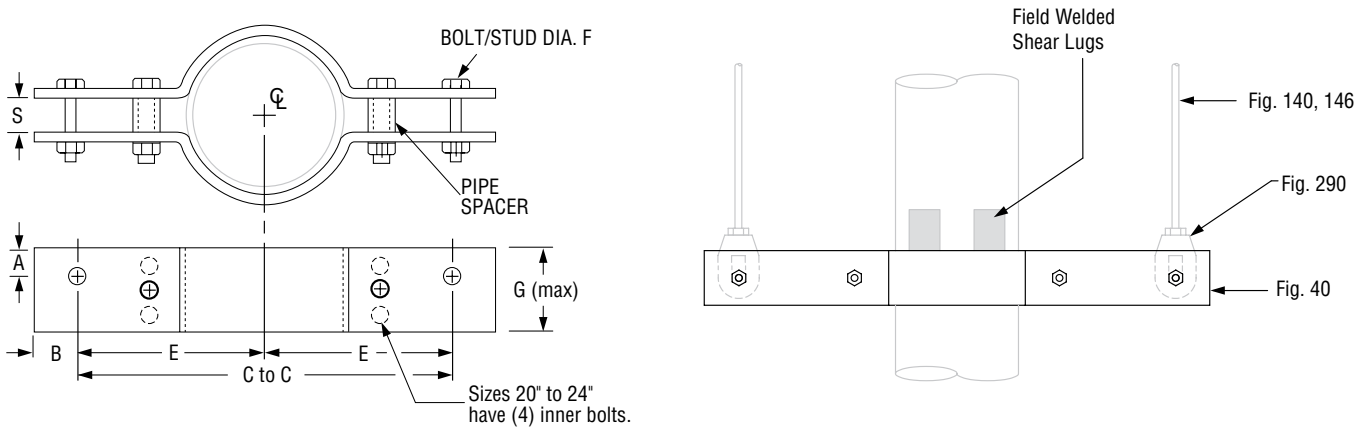


FIG. 40: DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS)

| Pipe Size | Max Load | | C-C | E | F (max) | G (max) | S | A (CS) | A (alloy) (SS) | B (max) | Maximum Weight Each | | | | | | |
|-----------|----------------|-----------------|-------|--------|---------|---------|-------|--------|----------------|---------|---------------------|-------|-------|-----|-----|-----|-----|
| | Rigid Assembly | Spring Assembly | | | | | | | | | CS | SS | Alloy | | | | |
| 2 | 900 | 1,800 | 18 | 9 | 1/2 | 2 1/2 | 3/4 | 1/4 | 7/8 | 2 | 18 | 15 | 18 | | | | |
| 2 1/2 | | | 20 | 10 | | | | | | | 20 | 20 | 20 | | | | |
| 3 | 1,500 | 3,000 | 22 | 11 | 3/4 | 3 | | 1 1/2 | | | 30 | 25 | 30 | | | | |
| 4 | 2,200 | 4,400 | | | | | | | | | 40 | 40 | 44 | | | | |
| 5 | | | 3,000 | 6,000 | 24 | 12 | 7/8 | 4 | 2 | | 1 1/8 | 45 | 40 | 45 | | | |
| 6 | 60 | 60 | | | | | | | | | | 73 | | | | | |
| 8 | 27 | 13 1/2 | | | 30 | 15 | 1 1/4 | 6 | 1 1/2 | | 7/8 | 1 1/8 | 82 | 82 | 82 | | |
| 10 | | | | | | | | | | | | | 157 | 157 | 157 | | |
| 12 | 7,800 | 15,600 | 32 | 16 | 1 1/2 | 7 | 1 3/4 | 1 3/8 | 1 3/8 | 3 | 216 | 202 | 250 | | | | |
| 14 | | | 34 | 17 | | | | | | | 228 | 228 | 263 | | | | |
| 16 | 9,000 | 18,000 | 36 | 18 | | | | | | | 8 | 2 | 1 1/2 | 2 | 314 | 277 | 315 |
| 18 | | | 39 | 19 1/2 | | | | | | | | | | | 9 | 338 | 338 |
| 20 | 13,500 | 27,000 | 42 | 21 | 2 | 10 | 2 1/2 | 2 5/8 | 2 5/8 | | 4 1/4 | 525 | 525 | 580 | | | |
| 24 | | | 45 | 22 1/2 | | | | | | | | 11 | 621 | 565 | 681 | | |

Fig. 261 (Formerly Afcon Fig. 400)

Extension Pipe or Riser Clamp

Size Range: 3/4" through 24"

Material: Carbon steel

Finish: Plain, Hot-Dip Galvanized with Zinc Plated Bolts & Nuts, Epoxy Coated or Painted.

Service: For support of stationary steel pipe risers, cast iron pipe or conduit. This product is not intended for use with hanger rods. For this application refer to Fig. 40 Riser Clamp, page 62.

Maximum Temperature: Plain 650° F, Galvanized and Epoxy 450° F

Approvals: Complies with Federal Specification A-A-1192A (Type 8) WW-H-171-E (Type 8), ANSI/MSS SP-69 and MSS SP-58 (Type 8), UL, ULC Listed (Sizes 1 1/2" - 8").

Installation: Clamp is fitted and bolted preferably below a coupling, hub or welded lugs on steel pipe. Bolt torques should be per industry standards (see page 288). Clamp is designed for standard steel pipe O.D. and this must be considered in sizing the riser for other types of piping.

Ordering: Specify pipe size, figure number, name and finish.



Note: Refer to Technical Data Section for cast iron soil pipe data.

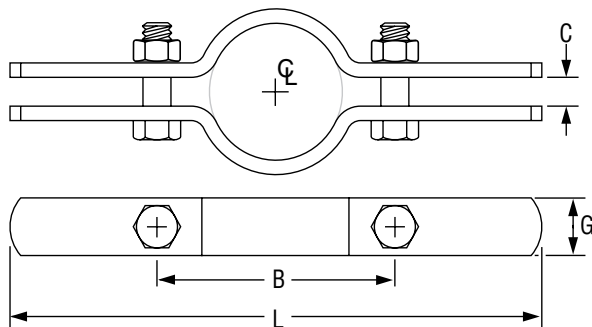


FIG. 261: DIMENSIONS (IN) • LOADS (LBS) • TORQUE (FT-LBS) • WEIGHT (LBS)

| Pipe Size | Max Load | Weight | L | G Width | B | C | Bolt Diameter | Torque Values | |
|-----------|----------|--------|--------|---------|--------|-----|---------------|---------------|--------|
| 3/4 | 220 | 1.1 | 8 7/8 | 1 | 2 7/8 | 3/8 | 3/8 | 21 | |
| 1 | | 1.1 | | | 3 3/8 | | | | |
| 1 1/4 | 250 | 1.6 | 10 | | 3 1/2 | | | | |
| 1 1/2 | | 1.6 | | | 3 3/8 | | | | |
| 2 | 300 | 1.7 | 10 1/4 | | 4 1/4 | 1/2 | 7/16 | | 32 |
| 2 1/2 | 400 | 1.9 | 11 1/4 | | 4 3/4 | | | | |
| 3 | 500 | 1.9 | 11 3/8 | 5 1/2 | 1/2 | 1/2 | 46 | | |
| 3 1/2 | 600 | 2.3 | 12 7/8 | 6 1/2 | | | | | |
| 4 | 750 | 2.4 | | 7 | | | | | |
| 5 | 1,500 | 3.6 | 13 3/4 | 1 1/2 | 8 | 5/8 | 5/8 | 100 | |
| 6 | 1,600 | 4.0 | 14 3/4 | | 9 | | | | |
| 8 | 2,500 | 7.6 | 18 1/2 | 2 | 12 | 3/4 | 3/4 | 150 | |
| 10 | | 11.1 | 20 1/4 | | 13 3/4 | | | | |
| 12 | 2,700 | 16.5 | 22 3/4 | | 2 1/2 | | | | 15 3/4 |
| 14 | | 17.7 | 24 | 17 1/4 | | | | | |
| 16 | 2,900 | 30.4 | 26 | 3 | 19 3/4 | 1 | 7/8 | 190 | |
| 18 | | 33.8 | 28 | | 21 3/4 | | | | |
| 20 | | 35.0 | 30 | | 23 3/4 | | | | |
| 24 | | 82.0 | 36 3/4 | | 30 | | | | |

Fig. 261SS

Extension Pipe or Riser Clamp

Size Range: 1/2" through 12"

Material: 304 stainless steel

Service: For support of stationary steel pipe risers or conduit.

Maximum Temperature: 650° F

Approvals: Complies with Federal Specification A-A-1192A (Type 8) WW-H-171-E (Type 8), ANSI/MSS SP-69 and MSS SP-58 (Type 8).

Installation: Clamp is fitted and bolted below a coupling, hub or welded lugs on steel pipe (2 lugs up to 3" pipe, 4 lugs up to 12" pipe). Bolt torques should be per industry standards (see page 288).

Clamp is designed for standard steel pipe O.D. and this must be considered in sizing the riser for other types of piping.

Ordering: Specify pipe size, figure number, name and finish.

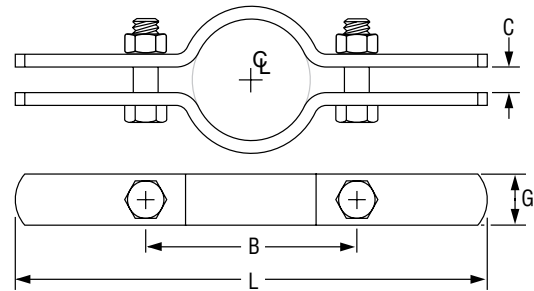


FIG. 261SS: DIMENSIONS (IN) • LOADS (LBS) • TORQUE (FT-LBS) • WEIGHT (LBS)

| Pipe Size | Max Load | | Lugs | Weight | L | G Width | B | C | Bolt Diameter | Torque Values |
|-----------|----------|--------|------|--------|--------|---------|--------|-----|---------------|---------------|
| | 450° F | 650° F | | | | | | | | |
| 1/2 - 3/4 | 185 | 165 | 2 | 1.1 | 8 7/8 | 1 | 2 7/8 | 3/8 | 3/8 | 21 |
| 1 | 210 | 190 | | 1.1 | | | 3 1/8 | | | |
| 1 1/4 | | | | 1.6 | | | 3 1/2 | | | |
| 1 1/2 | 255 | 230 | | 1.6 | 10 1/4 | | 3 7/8 | | | |
| 2 | 340 | 305 | | 1.7 | | | 4 1/4 | | | |
| 2 1/2 | 425 | 385 | | 1.9 | 11 1/4 | | 4 3/4 | 1/2 | 7/16 | |
| 3 | 510 | 460 | 1.9 | 11 3/8 | 5 1/2 | | | | | |
| 4 | 635 | 570 | 4 | 2.4 | 12 7/8 | 1 1/2 | 7 | 1/2 | 1/2 | 46 |
| 5 | 1,275 | 1,150 | | 3.6 | 13 3/4 | | 8 | | | |
| 6 | 1,360 | 1,225 | | 4.0 | 14 3/4 | | 9 | | | |
| 8 | 1,380 | 1,240 | | 7.6 | 18 1/2 | 12 | 5/8 | 5/8 | 100 | |
| 10 | 1,800 | 1,620 | | 11.1 | 20 1/4 | 2 | | | | |
| 12 | | | | 16.5 | 22 3/4 | | 15 3/4 | | | |

Fig. CT-121

Copper Tubing Riser Clamp

Size Range: 1/2" through 4"

Material: Carbon steel

Finish: Copper plated

Service: Recommended for support and steadying of copper tube risers, either insulated or non-insulated. This product is not intended for use with hanger rods.

Approvals: Complies with Federal Specification A-A-1192A (Type 8), WW-H-171-E (Type 8), ANSI/MSS SP-69 and MSS SP-58 (Type 8).

Service: For support and steadying of copper tubing risers.

Installation: Clamp is fitted and bolted preferably below a coupling or fitting on the tubing. Do not over tighten bolts.

Features: Rounded ears provide greater safety for personnel.

Ordering: Specify tube size, figure number, and name.

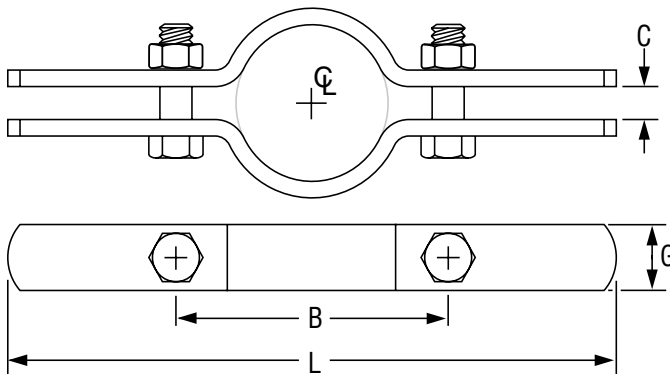


FIG. CT-121: DIMENSIONS (IN) • LOADS (LBS) • TORQUE (FT-LBS) • WEIGHT (LBS)

| Tube Size | Max Load | Weight | L | G Width | B | C | Bolt Size | Torque Values |
|-----------|----------|--------|----------|---------|-------|-----|-----------|---------------|
| 1/2 | 75 | 0.52 | 6 1/2 | 1 | 2 7/8 | 3/8 | 5/16 | 11 |
| 3/4 | | 0.56 | 7 | | 3 1/8 | | | |
| 1 | 120 | 0.94 | 9 5/8 | 1 1/4 | 3 1/2 | 1/2 | 3/8 | 21 |
| 1 1/4 | | 0.98 | 9 5/8 | | 3 7/8 | | | |
| 1 1/2 | 150 | 1.50 | 10 | 1 1/4 | 4 1/4 | 1/2 | 3/8 | 21 |
| 2 | | 1.50 | 10 3/8 | | 4 3/4 | | | |
| 2 1/2 | 300 | 1.70 | 11 13/16 | 1 1/4 | 5 1/2 | 1/2 | 3/8 | 21 |
| 3 | | 1.80 | 11 1/2 | | 6 1/2 | | | |
| 3 1/2 | 300 | 1.90 | 12 | 1 | 7 | 1/2 | 1/2 | 46 |
| 4 | | 2.60 | 13 | | 7 | | | |

Note: Minimum loads per MSS SP only applicable to 1 1/4" and up.

U-BOLTS & STRAPS

Fig. 120

Size Range: 1/2" through 10"

Material: Carbon steel

Finish: Plain or Zinc Plated (Hot-Dip Galvanized optional)

Service: Recommended for support, or guide of relatively light loads. Normally used with two hex nuts.

Maximum Temperature: 650° F.

Ordering: Specify pipe size x rod size, figure number and name. Hex nuts must be ordered separately.

Note: The acceptability of galvanized coatings at temperatures above 450°F is at the discretion of the end user.

Light Weight U-Bolt

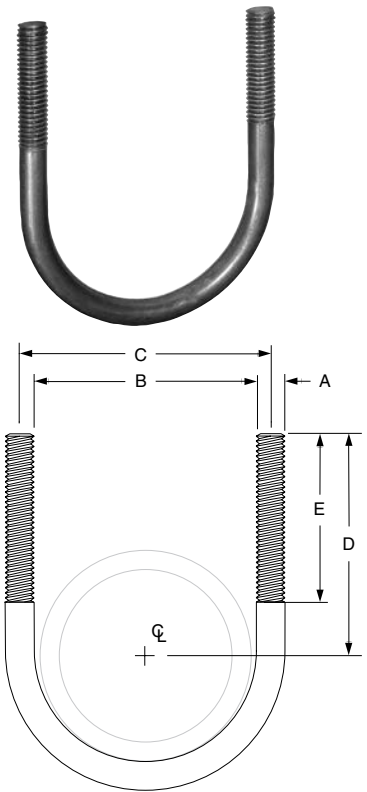


FIG. 120: DIMENSIONS (IN) • LOADS (LBS) • WEIGHTS (LBS)

| Pipe Size | Max Load | Weight | Rod Size A | B | C | D | E |
|-----------|----------|--------|------------|--------|--------|--------|------|
| 1/2 | 580 | 0.06 | 1/4 | 15/16 | 13/16 | 115/16 | 13/4 |
| 3/4 | | 0.07 | | 11/8 | 13/8 | 21/16 | |
| 1 | | 0.07 | | 13/8 | 15/8 | 23/16 | |
| 1 1/4 | | 0.08 | | 111/16 | 115/16 | 23/8 | |
| 1 1/2 | | 0.09 | | 2 | 21/4 | 27/16 | |
| 2 | 0.10 | 27/16 | 211/16 | 211/16 | 211/16 | 2 | |
| 2 1/2 | 0.28 | 215/16 | 35/16 | 31/16 | | | |
| 3 | 0.31 | 39/16 | 315/16 | 33/8 | | | |
| 3 1/2 | 0.35 | 41/16 | 47/16 | 35/8 | | | |
| 4 | 0.38 | 49/16 | 419/16 | 37/8 | | | |
| 5 | 0.45 | 55/8 | 6 | 49/16 | 2 1/4 | | |
| 6 | 0.95 | 63/4 | 71/4 | 51/16 | | | |
| 8 | 1.20 | 83/4 | 91/4 | 61/16 | | | |
| 10 | 4,320 | 2.30 | 5/8 | 107/8 | 111/2 | 71/4 | 21/2 |

Fig. 137C: Plastic Coated

U-Bolts

Size Range: 1/2" through 8"

Material: Carbon steel U-bolt and four finished hex nuts. Formed portion of the U-bolt is plastic coated.

Maximum Temperature: 225° F

Service: Recommended for support or guide for glass, copper, brass and aluminum pipe.

Approvals: Complies with Federal Specification A-A-1192A (Type 24), WW-H-171-E (Type 24),

ANSI/MSS SP-69 and MSS SP-58 (Type 24).

Ordering: Specify pipe size x rod size (e.g., 2 x 3/8), figure number and name.

If hex nuts are not required, specify "without hex nuts".

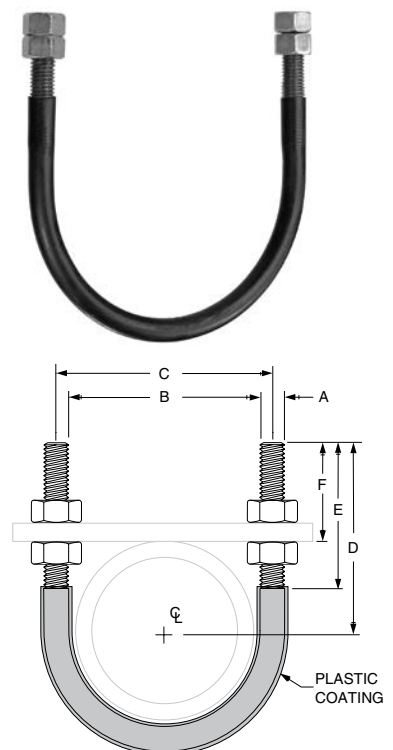


FIG. 137C: DIMENSIONS (IN) LOADS (LBS) • WEIGHTS (LBS)

| Pipe Size | Rod Size A | Max Load | Weight | B | C | D | E | F |
|-----------|------------|----------|--------|--------|--------|------|------|--------|
| 1/2 | 1/4 | 580 | 0.11 | 15/16 | 13/16 | 23/4 | 23/8 | 25/16 |
| 3/4 | | | 0.12 | 11/8 | 13/8 | | | 27/32 |
| 1 | | | 0.12 | 13/8 | 15/8 | | | 23/32 |
| 1 1/4 | 3/8 | 1,460 | 0.28 | 111/16 | 21/16 | 27/8 | 21/2 | 21/32 |
| 1 1/2 | | | 0.30 | 2 | 23/8 | 3 | | 21/16 |
| 2 | | | 0.33 | 27/16 | 213/16 | 31/4 | | 25/16 |
| 2 1/2 | 1/2 | 2,700 | 0.73 | 215/16 | 37/16 | 33/4 | 3 | 21/4 |
| 3 | | | 0.78 | 39/16 | 41/16 | 4 | | 27/32 |
| 3 1/2 | | | 0.84 | 41/16 | 49/16 | 41/4 | | 21/16 |
| 4 | 5/8 | 4,320 | 0.90 | 49/16 | 51/16 | 41/2 | 31/2 | 27/32 |
| 5 | | | 1.00 | 55/8 | 61/8 | 5 | | 213/16 |
| 6 | | | 2.00 | 63/4 | 73/8 | 61/8 | | |
| 8 | | | 2.30 | 83/4 | 93/8 | 71/8 | | |

Fig. 137: Standard U-bolt Fig. 137S*: Special U-bolt (non-standard)

Size Range: 1/2" through 36"

Material: Carbon steel U-bolt and four finished hex nuts

Finish: Plain, Fig. 137: Zinc Plated (Hot-Dip Galvanized optional) or Fig. 137S: Hot-Dip Galvanized (HDG not available for rod size 1/4". Stainless steel is offered as an alternative.)

Service: Recommended for support, or guide of heavy loads; often employed in power, process plant and marine service.

Approvals: Complies with Federal Specification A-A-1192A (Type 24), WW-H-171-E (Type 24), ANSI/MSS SP-69 and MSS SP-58 (Type 24).

Ordering Fig. 137: Specify pipe size x rod size (e.g., 6 x 5/8), figure number, name.

U-bolt will be furnished with longer tangents D or with longer threads E

if so required and ordered. If hex nuts are not required, specify "without hex nuts".

Ordering Fig. 137S: Specify figure number, name, material specification, dimensions A, B, C, D, and E, and "with hex nuts" or "without hex nuts".

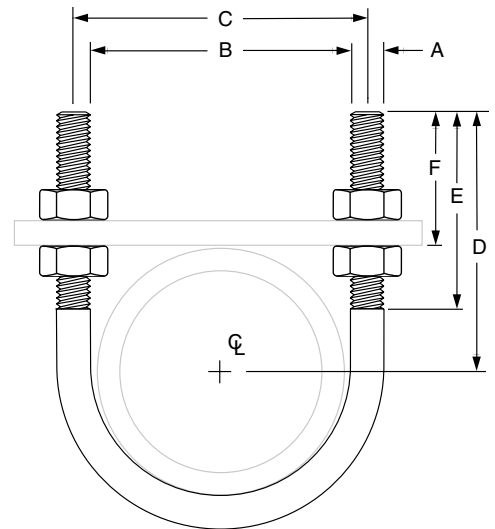
Note: The acceptability of galvanized coatings at temperatures above 450°F is at the discretion of the end user.



FIG. 137: DIMENSIONS (IN) • LOADS (LBS) • WEIGHTS (LBS) ■

| Pipe Size | Rod Size A | Max Normal Load | | 650° F Max Side Load | Wt. | B | C | D | E | F |
|-----------|------------|-----------------|--------|----------------------|------|---------|---------|--------|-------|---------|
| | | 650° F | 750° F | | | | | | | |
| 1/2 | 1/4 | 580 | 454 | 145 | 0.11 | 15/16 | 1 1/16 | 2 3/4 | 2 1/8 | 2 5/16 |
| 3/4 | | | | | 0.12 | 1 1/8 | 1 3/8 | | | 2 7/32 |
| 1 | | | | | 0.12 | 1 3/8 | 1 5/8 | | | 2 3/32 |
| 1 1/4 | 3/8 | 1,460 | 1,144 | 365 | 0.28 | 1 11/16 | 2 1/16 | 2 7/8 | 2 1/2 | 2 1/32 |
| 1 1/2 | | | | | 0.30 | 2 | 2 3/8 | 3 | | 2 1/16 |
| 2 | | | | | 0.33 | 2 1/16 | 2 13/16 | 3 1/4 | | 2 1/16 |
| 2 1/2 | 1/2 | 2,700 | 2,114 | 675 | 0.73 | 2 5/16 | 3 7/16 | 3 3/4 | 3 | 2 5/16 |
| 3 | | | | | 0.78 | 3 9/16 | 4 1/16 | 4 | | 2 1/4 |
| 3 1/2 | | | | | 0.84 | 4 1/16 | 4 9/16 | 4 1/4 | | 2 1/4 |
| 4 | | | | | 0.90 | 4 9/16 | 5 1/16 | 4 1/2 | | 2 7/32 |
| 5 | | | | | 1.0 | 5 5/8 | 6 1/8 | 5 | | 2 1/4 |
| 6 | 5/8 | 4,320 | 3,382 | 1,080 | 2.0 | 6 3/4 | 7 3/8 | 6 1/8 | 3 1/2 | 2 13/16 |
| 8 | | | | | 2.3 | 8 3/4 | 9 3/8 | 7 1/8 | | 2 13/16 |
| 10 | 3/4 | 6,460 | 5,060 | 1,615 | 4.9 | 10 7/8 | 11 5/8 | 8 3/8 | 4 | 3 |
| 12 | | | | | 7.7 | 12 7/8 | 13 3/4 | 9 5/8 | | 3 1/4 |
| 14 | 7/8 | 9,960 | 7,016 | 2,240 | 8.3 | 14 1/8 | 15 | 10 1/4 | 4 1/4 | 3 1/4 |
| 16 | | | | | 9.2 | 16 1/8 | 17 | 11 1/4 | | 3 1/4 |
| 18 | | | | | 13.5 | 18 1/8 | 19 1/8 | 12 5/8 | | 3 1/4 |
| 20 | 1 | 11,800 | 9,240 | - | 14.6 | 20 1/8 | 21 1/8 | 13 3/8 | 4 3/4 | 3 5/8 |
| 24 | | | | | 16.9 | 24 1/8 | 25 1/8 | 15 5/8 | | 3 5/8 |
| 30 | | | | | 19.1 | 30 3/8 | 31 1/8 | 18 5/8 | | 3 5/8 |
| 36 | | | | | 23.2 | 36 1/8 | 37 1/8 | 21 5/8 | | 3 5/8 |

■ Loads, weights and dimensions shown do not apply for Fig. 137S. Max load rating for carbon steel is based on 2 x load rating for rod. Max load rating for stainless steel is 0.85 times the maximum stated load ratings listed above.



*When the combination of a normal load and a side load occurs, a straight line interaction formula may be used to determine if the Fig. 137 is still within the allowable stress range:

$$P_n/P_{na} + P_s/P_{sa} \leq 1$$

Where:

P_n = actual applied normal load;

P_{na} = allowable normal load for the Fig. 137;

P_s = actual applied side load;

P_{sa} = allowable side load for the Fig. 137

Nuts must be snug tight in installation to achieve side loads shown.

Fig. 137SS

Stainless Steel U-Bolt

Size Range: 1/2" through 12"

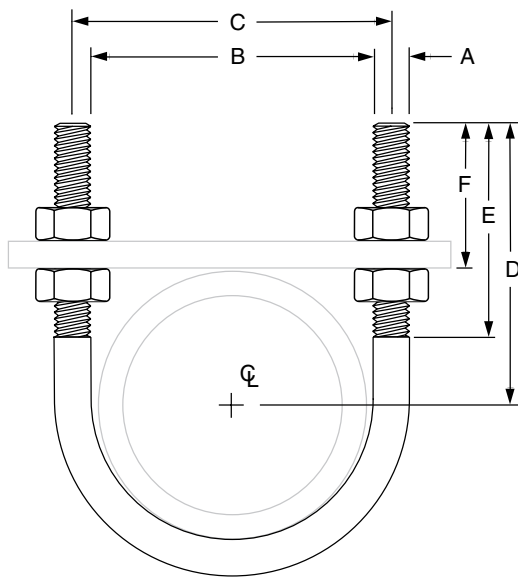
Material: Stainless steel U-bolt and four finished hex nuts

Finish: 304 stainless steel

Service: Recommended for support, or guide of heavy loads; often employed in power, process plant and marine service.

Approvals: Complies with Federal Specification A-A-1192A (Type 24), WW-H-171-E (Type 24), ANSI/MSS SP-69 and MSS SP-58 (Type 24).

Ordering: Specify pipe size x rod size (e.g., 6 x 5/8), figure number and name. If hex nuts are not required, specify "without hex nuts".



| FIG. 137SS: DIMENSIONS (IN) • LOADS (LBS) • WEIGHTS (LBS) | | | | | | | | | | | | |
|---|------------|-----------------|--------|---------------|--------|------|---------|---------|-------|-------|---------|---------|
| Pipe Size | Rod Size A | Max Normal Load | | Max Side Load | | Wt. | B | C | D | E | F | |
| | | 450° F | 650° F | 450° F | 650° F | | | | | | | |
| 1/2 | 1/4 | 500 | 454 | 120 | 110 | 0.11 | 15/16 | 13/16 | 2 3/4 | 2 1/8 | 2 5/16 | |
| 3/4 | | | | | | 0.12 | 1 1/8 | 1 3/8 | | | 2 7/32 | |
| 1 | | | | | | 0.12 | 1 3/8 | 1 5/8 | | | 2 3/32 | |
| 1 1/4 | 3/8 | 1,240 | 1,144 | 310 | 280 | 0.28 | 1 11/16 | 2 1/16 | 2 7/8 | 2 1/2 | 2 1/32 | |
| 1 1/2 | | | | | | 0.30 | 2 | 2 3/8 | | | 3 | 2 1/16 |
| 2 | | | | | | 0.33 | 2 7/16 | 2 13/16 | | | 3 1/4 | 2 1/16 |
| 2 1/2 | 1/2 | 2,300 | 2,070 | 570 | 515 | 0.73 | 2 15/16 | 3 7/16 | 3 3/4 | 3 | 2 5/16 | |
| 3 | | | | | | 0.78 | 3 9/16 | 4 1/16 | | | 4 | 2 1/4 |
| 4 | | | | | | 0.90 | 4 9/16 | 5 1/16 | | | 4 1/2 | 2 7/32 |
| 5 | | | | | | 1.0 | 5 5/8 | 6 1/8 | | | 5 | 2 7/32 |
| 6 | 5/8 | 3,675 | 3,310 | 915 | 825 | 2.0 | 6 3/4 | 7 3/8 | 6 1/8 | 3 1/2 | 2 13/16 | |
| 8 | | | | | | 2.3 | 8 3/4 | 9 3/8 | | | 7 1/8 | 2 13/16 |
| 10 | 3/4 | 5,490 | 4,940 | 1,370 | 1,235 | 4.9 | 10 7/8 | 11 5/8 | 8 3/8 | 4 | 3 | |
| 12 | 7/8 | 8,400 | 7,560 | 2,115 | 1,905 | 7.7 | 12 7/8 | 13 3/4 | 9 5/8 | | 3 1/4 | |

*When the combination of a normal load and a side load occurs, a straight line interaction formula may be used to determine if the Fig. 137 is still within the allowable stress range:

$$P_n/P_{na} + P_s/P_{sa} \leq 1$$

Where:

P_n = actual applied normal load;

P_{na} = allowable normal load for the Fig. 137;

P_s = actual applied side load;

P_{sa} = allowable side load for the Fig. 137

Nuts must be snug tight in installation to achieve side loads shown.

Fig. 126

One-Hole Clamp

Size Range: 3/8" through 4"

Material: Malleable iron

Finish: Plain or Zinc Plated

Service: For support of standard conduit, cable and steel pipe on walls or sides of beams.

Not recommended for use horizontally on ceilings, bottoms of beams and similar installations since the factor of safety is greatly reduced when so used.

Maximum Temperature: 450° F

Ordering: Specify pipe size, figure number, name and finish. Specify nominal size of conduit or pipe or outside diameter of lead cable with which the clamp is to be used.

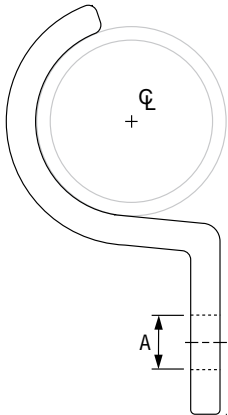


FIG. 126: DIMENSIONS (IN) • WEIGHTS (LBS)

| Pipe Size | Cable Size or Outside Dia. of Conduit ■ | Weight | Dia. of Hole - A | Size Screw/Bolt |
|-----------|---|--------|------------------|-----------------|
| 3/8 | 0.67 | 0.03 | 1/4 | No. 10 |
| 1/2 | 0.84 | 0.03 | 5/16 | 1/4 |
| 3/4 | 1.05 | 0.05 | | |
| 1 | 1.31 | 0.09 | | |
| 1 1/4 | 1.66 | 0.12 | 3/8 | 3/8 |
| 1 1/2 | 1.90 | 0.16 | 7/16 | |
| 2 | 2.37 | 0.25 | 1 1/16 | 5/8 |
| 2 1/2 | 2.87 | 0.49 | | |
| 3 | 3.50 | 0.82 | | |
| 4 | 4.50 | 1.30 | 3/4 | |

■ Screws or bolts not included

Fig. 243

Pipe Strap – Square

Size Range: 1/2" through 6" pipe

Material: Carbon steel

Finish: Plain

Service: Restraint of pipe in specified direction while permitting movement in non-restrained direction.

Maximum Temperature: 650° F

Ordering: Specify figure number, name, and pipe size. Larger sizes available upon request.



FIG. 243: DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS)

| Pipe Size | L | T | W | Rated Load Pn | Weight |
|-----------|-------|-----|---|---------------|--------|
| 1/2 | 3 | 1/4 | 2 | 600 | 0.71 |
| 3/4 | 3 1/2 | | | | 0.84 |
| 1 | 4 | | | | 0.98 |
| 1 1/4 | 4 1/2 | 3/8 | 3 | 1,500 | 2.64 |
| 1 1/2 | 5 | | | | 2.94 |
| 2 | 5 1/2 | | | | 3.39 |
| 2 1/2 | 6 | 1/2 | 4 | 2,500 | 5.20 |
| 3 | 6 1/2 | | | | 7.93 |
| 4 | 7 1/2 | | | | 9.63 |
| 6 | 9 3/4 | | 6 | 3,000 | 19.97 |

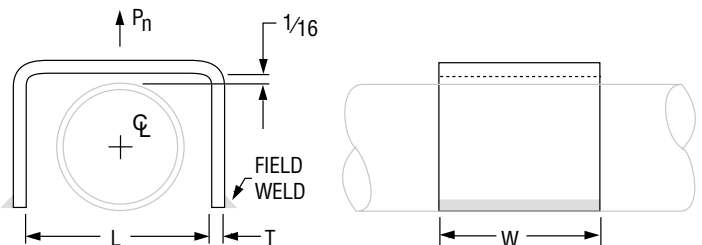


Fig. 244

Pipe Strap – Round

Size Range: 1/2" through 6" pipe

Material: Carbon steel

Finish: Plain

Service: Restraint of pipe in specified direction while permitting movement in non-restrained direction.

Maximum Temperature: 650° F

Ordering: Specify figure number, name, and pipe size. Larger sizes available upon request.



**FIG. 244:
DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS)**

| Pipe Size | Rated Load | | L | T | W | Weight |
|-----------|------------|-------|--------|-----|---|--------|
| | Ps | Pn | | | | |
| 1/2 | 250 | 1,500 | 1 | 1/4 | 2 | 0.39 |
| 3/4 | | | 1 1/16 | | | 0.47 |
| 1 | | | 1 7/16 | | | 0.56 |
| 1 1/4 | 500 | 2,000 | 1 3/4 | 3/8 | 3 | 1.62 |
| 1 1/2 | | | 2 | | | 1.81 |
| 2 | | | 2 1/2 | | | 2.20 |
| 2 1/2 | 650 | 2,300 | 3 | 1/2 | 4 | 3.56 |
| 3 | | | 3 3/8 | | | 5.74 |
| 4 | | | 4 3/4 | | | 7.16 |
| 6 | | | 6 3/4 | | | 15.32 |

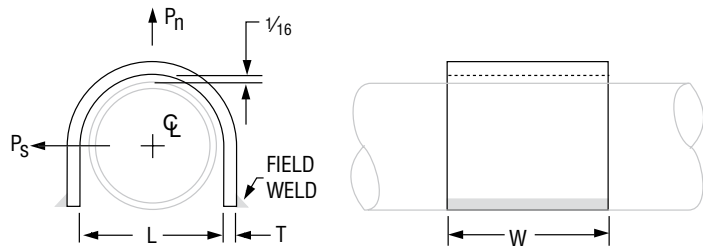


Fig. 262 (Formerly Afcon Fig. 500)

Strap Short

Size Range: 1/2" through 4"

Material: Carbon steel

Finish: Plain or Zinc Plated (Hot-Dip Galvanized optional)

Maximum Temperature: 650° F

Approvals: Complies with Federal Specification A-A-1192A (Type 26), WW-H-171-E (Type 26), ANSI/MSS SP-69 and MSS SP-58 (Type 26).

Ordering: Specify pipe size, figure number, name and finish.

Note: The acceptability of galvanized coatings at temperatures above 450°F is at the discretion of the end user.

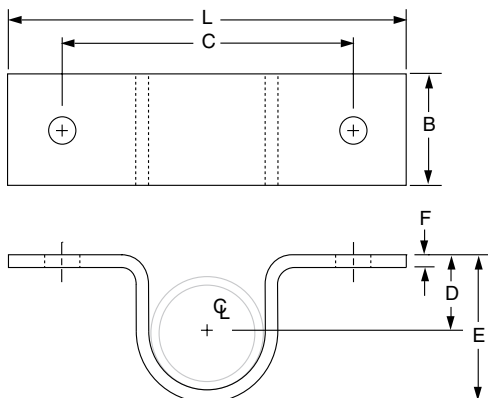


FIG. 262: DIMENSIONS (IN) • LOADS (LBS) • WEIGHTS (LBS)

| Pipe Size | Max Load | | Weight | Screw or Bolt Size ■ | L | B | C | D | E | F |
|-----------|--------------|------------------|---------|--|---------|-------|--------|--------|-------|-----|
| | w/Lag Screws | w/Bolts to Steel | | | | | | | | |
| 1/2 | 300 | 410 | 0.20 | Two #18 x 2 steel wood screws or two 3/8" bolts to steel | 4 | 1 1/4 | 2 3/4 | 1/2 | 1 1/8 | 1/8 |
| 3/4 | | | 4 3/8 | | 3 1/8 | | 1 1/16 | 1 7/16 | | |
| 1 | | | 4 3/4 | | 3 1/2 | | 1 1/16 | 1 5/8 | | |
| 1 1/4 | | | 5 | | 3 3/4 | | 1 1/16 | 2 1/8 | | |
| 1 1/2 | | | 5 3/8 | | 4 1/8 | | 1 3/8 | 2 1/2 | | |
| 2 | | | 6 3/8 | | 5 1/8 | | 1 1/4 | 2 3/4 | | |
| 2 1/2 | 450 | 610 | 1.40 | Two #18 x 3 steel wood screws or two 3/8" bolts to steel | 6 13/16 | 1 1/2 | 5 9/16 | 1 3/4 | 3 3/8 | 1/4 |
| 3 | | | 7 5/16 | | 6 1/16 | | 1 7/8 | 4 | | |
| 3 1/2 | | | 7 13/16 | | 6 9/16 | | 2 3/16 | 4 5/8 | | |
| 4 | | | 8 3/8 | | 7 1/8 | | 2 5/8 | 5 | | |

■ Screws or bolts not included

Fig. 266

Light Duty Two Hole Pipe Strap

Size Range: 3/8" through 4"

Material: Carbon steel, Pre-Galvanized

Ordering: Specify pipe size, figure number, name and finish.

Note: Intended for restraint of pipe in horizontal or vertical installations.

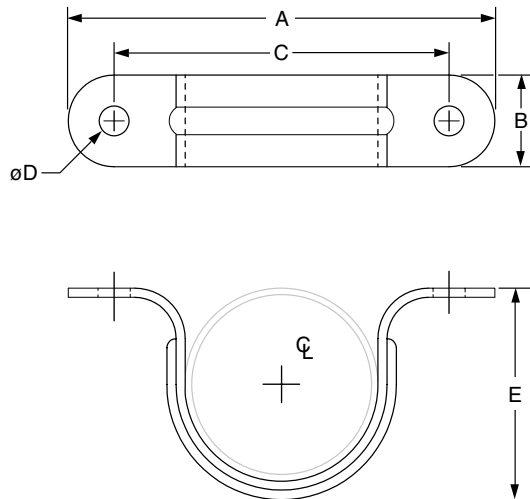


FIG. 266: DIMENSIONS (IN) • WEIGHTS (LBS)

| Pipe Size | Weight per 100pcs | A | B | C | øD | E |
|-----------|-------------------|------|------|------|------|------|
| 3/8 | 2 | 2.40 | 0.75 | 0.67 | 0.25 | 0.70 |
| 1/2 | 3 | 2.52 | | 0.83 | | 0.87 |
| 3/4 | 5 | 2.68 | | 1.06 | | 1.10 |
| 1 | 8 | 3.15 | | 1.30 | | 1.34 |
| 1 1/4 | 9 | 3.66 | | 1.65 | | 1.65 |
| 1 1/2 | 11 | 4.06 | | 1.89 | | 1.87 |
| 2 | 13 | 5.04 | | 2.36 | | 2.36 |
| 2 1/2 | 15 | 5.67 | | 2.87 | | 2.95 |
| 3 | 16 | 6.42 | | 3.50 | | 3.51 |
| 4 | 39 | 7.72 | | 4.49 | | 4.49 |

Screws or bolts not included.

Fig. 184 (Formerly Afcon Fig. 515) Double Offset Hanger and Restrainer

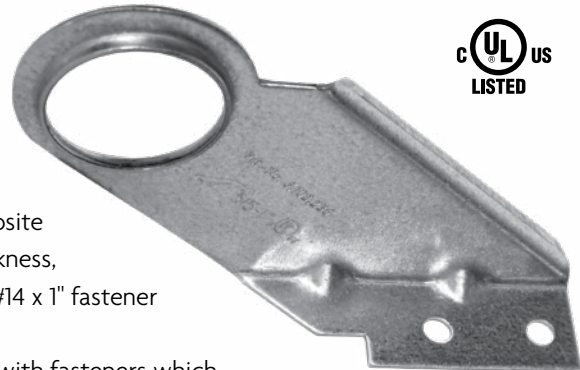
Size Range: 3/4" through 1"

Material: Carbon Steel

Finish: Pre-Galvanized per ASTM A653

Service:

- Hanger and surge restraint for horizontal CPVC piping when installed on the side of the supporting structure.
- Listed with hardware provided on structural wood beams and composite wood beams (1" minimum). For wood structures with less than 1" thickness, wood blocks may be placed on the backside of the wood structure. #14 x 1" fastener provided must be fully engaged in the wood block.
- May be installed with concrete, steel, and other structural members with fasteners which comply with the requirements of NFPA 13.



Approvals: cULus Listed

Installation:

- Slide CPVC pipe through the double offset hanger and restrainer.
- Secure the hanger to the supporting structure with the screws provided or with listed fasteners.

Features:

- Beveled edge design helps protect the CPVC pipe from any rough surface and eliminates pipe abrasion.
- Easily attaches to wood structure with #14 x 1" hex washer head self-threading screw supplied with product. No pre-drilling required.
- Bottom of pipe is offset 1 1/2" from the structure. Eliminates wooden spacer blocks

Ordering: Specify CPVC pipe size, figure number and description.

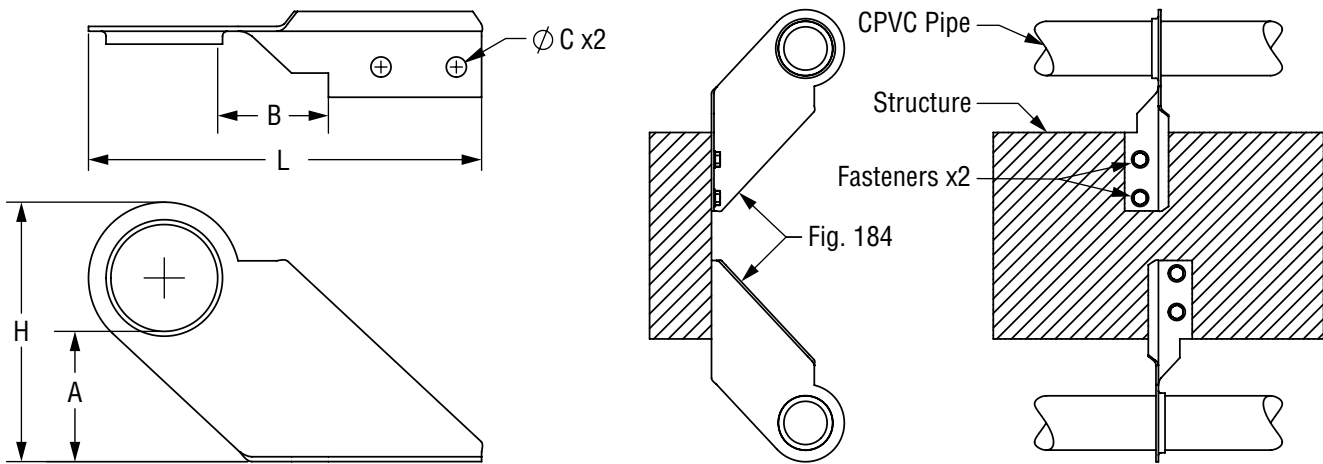


FIG. 184: DIMENSIONS (IN) • WEIGHT (LBS)

| CPVC Pipe Size | A | B | ϕC | H | L | Max. Hanger Spacing (FT.) | Approx. Weight/100 |
|----------------|-------|-------|----------|-------|-------|---------------------------|--------------------|
| 3/4 | 1 1/2 | 1 1/2 | 1/4 | 3 3/8 | 5 3/8 | 5 1/2 | 17 |
| 1 | 1 1/2 | 1 1/2 | 1/4 | 3 3/8 | 5 3/8 | 6 | 17 |

Fig. 185 (Formerly Afcon Fig. 513)

One Hole Pipe Strap

Size Range: 3/4" through 2"

Finish: Zinc Plated Steel (Hot-Dip Galvanized optional)

Service: Hanger for CPVC pipe in the horizontal position on the side of structural wood beams and Steel 20 Ga. (min) with hanger tab in the upward position only (Fig. A). It can also be used as a guide to limit movement of vertical CPVC pipe with the tab in the horizontal position.

Approvals: UL and ULC Listed.

Installation:

- Place hanger over pipe.
- Secure hanger to mounting surface with screws provided.
- Steel applications require one (1) #14 x 1" hex washer head self-drilling TEK screw. Not Supplied. Part Number STD-0090.

Features:

- Beveled edge design helps protect the CPVC pipe from any rough surface.
- Easily attaches to wood structure with #10 x 1" hex washer head self threading screw supplied with product. No pre-drilling required.

Ordering: Specify CPVC pipe size, figure number and description.

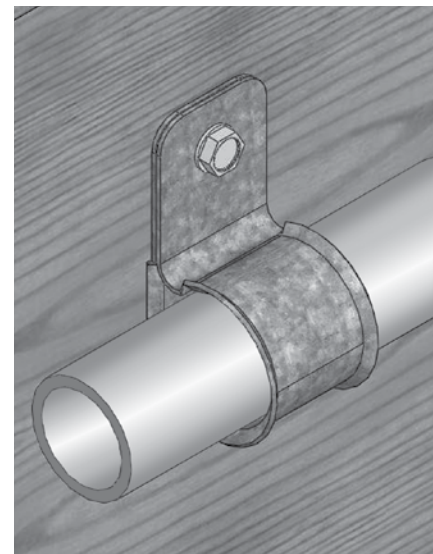
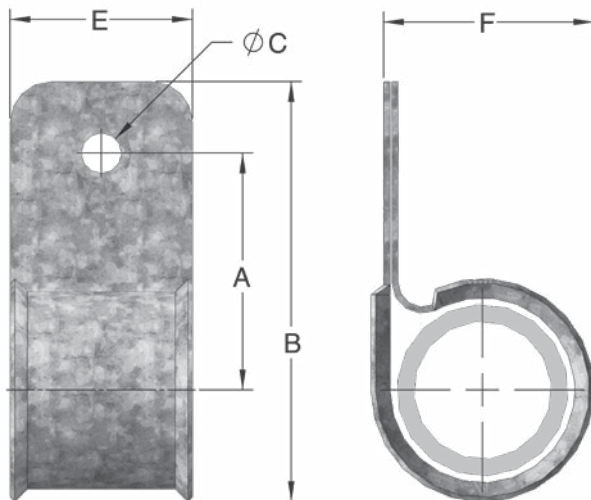


Fig. A

FIG. 185: DIMENSIONS (IN) • WEIGHT (LBS)

| CPVC Pipe Size | A | B | øC | E | F | Max. Hanger Spacing (FT.) | Approx. Weight/100 (lbs) |
|----------------|---------|--------|-----|-------|-------|---------------------------|--------------------------|
| 3/4 | 1 1/16 | 2 1/2 | 1/4 | 1 1/8 | 1 1/4 | 5 1/2 | 8 |
| 1 | 1 3/4 | 2 7/8 | 1/4 | 1 1/8 | 1 1/2 | 6 | 9 |
| 1 1/4 | 1 11/16 | 3 | 1/4 | 1 1/8 | 1 7/8 | 6 1/2 | 10 |
| 1 1/2 | 1 7/8 | 3 7/16 | 1/4 | 1 1/8 | 2 1/8 | 7 | 12 |
| 2 | 2 | 3 3/8 | 1/4 | 1 1/8 | 2 5/8 | 8 | 14 |

Fig. 186 (Formerly Afcon Fig. 510)

Two Hole Pipe Strap

Size Range: 3/4" through 3"

Finish: Pre-Galvanized Carbon Steel per ASTM A653

Service: Hanger for CPVC, steel, & copper pipe in the horizontal position on the bottom and side of structural wood beams, composite beams and Steel 20 Ga. (min.) (Fig. A, C respectively). Can be used as a restrainer when installed on top of structural wood beams (Fig. B), for limiting pipe movement due to thrust loads during sprinkler system start-up. It can also be used as a guide to limit movement for pipe in the vertical position. When used on composite wood beams, web thickness must be 3/8" or greater.

Approvals: cULus Listed

Installation:

- Snap hanger over pipe.
- Secure hanger to mounting surface with screws provided.
- Do not make adjustments to hanger mounting flanges that result in clamping the pipe to the mounting surface. Pipe must be allowed to move freely through hanger.
- Steel applications require two (2) #14 x 1" hex washer head self-drilling TEK screws. Not Supplied. Part Number STD-0090.

Features:

- Beveled edge design helps protect the CPVC pipe from any rough surface.
- Easily attaches to wood structure with #10 x 1" hex washer head self threading screw supplied with product. No pre-drilling required.
- Retaining dimples hold the strap onto the pipe for ease of installation. (Not shown)

Ordering: Specify pipe size, figure number, and description.

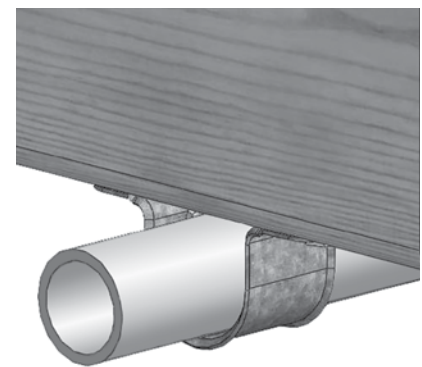


Fig. A

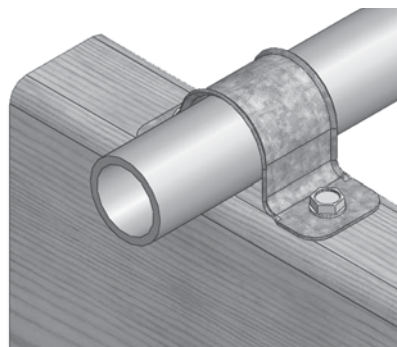


Fig. B

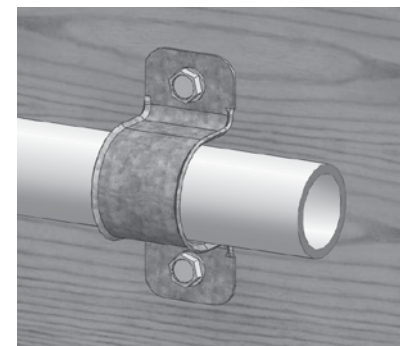


Fig. C

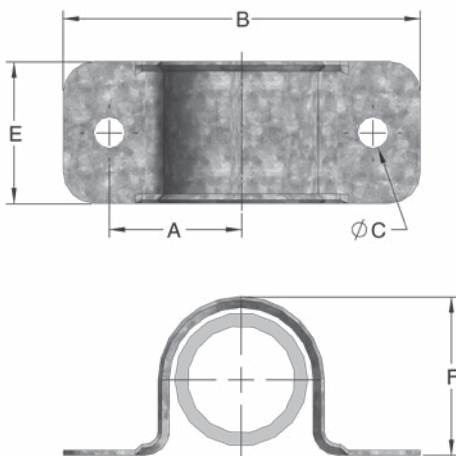


FIG. 186: DIMENSIONS (IN) • WEIGHT (LBS)

| Pipe Size | A | B | øC | E | F | Approx. Weight/100 (lbs) |
|-------------------------------|---------------------------------|---------------------------------|-----|--------------------------------|--------------------------------|--------------------------|
| 3/4 | 1 | 2 ¹³ / ₁₆ | 1/4 | 1/8 | 1/8 | 5 |
| 1 | 1 ¹ / ₄ | 3 ¹ / ₄ | | | 1/2 | 6 |
| 1 ¹ / ₄ | 1 ⁵ / ₁₆ | 3 ³ / ₈ | | | 1 ¹ / ₁₆ | 7 |
| 1 ¹ / ₂ | 1 ⁹ / ₁₆ | 3 ⁷ / ₈ | | | 2 ¹ / ₈ | 8 |
| 2 | 1 ¹³ / ₁₆ | 4 ⁵ / ₁₆ | | | 2 ⁹ / ₁₆ | 9 |
| 2 ¹ / ₂ | 2 ¹ / ₄ | 5 ³ / ₈ | | 1 ³ / ₁₆ | 2 ⁷ / ₈ | 14 |
| 3 | 2 ⁵ / ₈ | 6 ⁵ / ₁₆ | | | 3 ¹ / ₂ | 17 |

Fig. 187 (Formerly Afcon Fig. 511)

Two Hole 90° Side Mount Strap

Size Range: 3/4" through 2"

Finish: Zinc Plated Steel (Hot-Dip Galvanized optional)

Service: Hanger for CPVC pipe in the horizontal position on the bottom of structural wood beams and Steel 20 Ga. (min.) (Fig. A). *Can be used as a restrainer, only in Steel 20 Ga. (min) (Fig. B).* During installation, adjust hanger mounting flanges such that pipe contacts both mounting surface and hanger, minimizing vertical pipe movement.

Approvals: UL and ULC Listed.

Installation:

- Snap hanger over pipe.
- Secure hanger to mounting surface with screws provided.
- Do not anchor tightly to mounting surface. Pipe must be allowed to move freely through hanger.
- Steel applications require two (2) #14 x 1" hex washer head self-drilling TEK screws. Not Supplied. Part Number STD-0090.

Features:

- Beveled edge design helps protect the CPVC pipe from any rough surface.
- Easily attaches to wood structure with #10 x 1" hex washer head self threading screw supplied with product. No pre-drilling required.

Ordering: Specify CPVC pipe size, figure number and description.

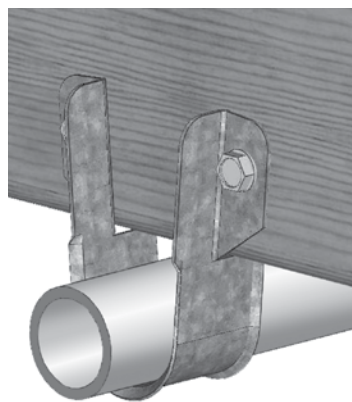
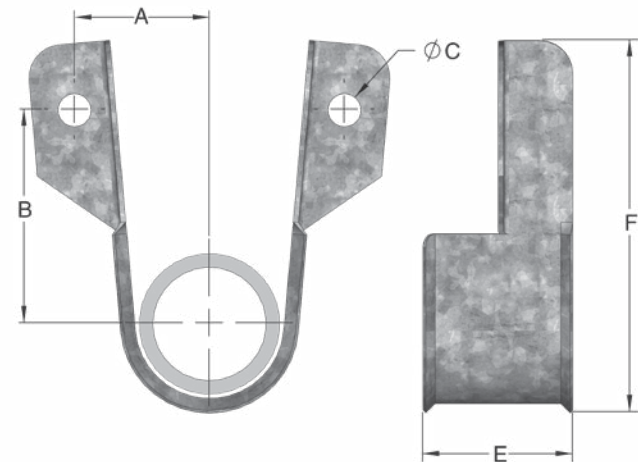


Fig. A

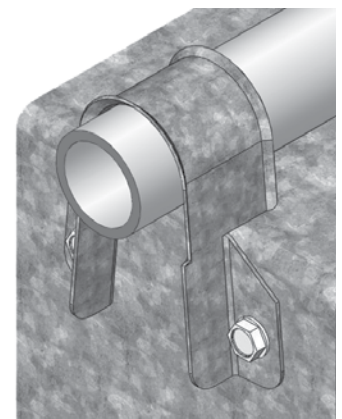


Fig. B

FIG. 187: DIMENSIONS (IN) • WEIGHT (LBS)

| CPVC Pipe Size | A | B | øC | E | F | Max. Hanger Spacing (FT.) | Approx. Weight/100 (lbs) |
|----------------|--------------------------------|----|----|----|---------------------------------|---------------------------|--------------------------|
| 3/4 | 1 | 1½ | ¼ | 1½ | 2¾ | 5½ | 5 |
| 1 | 1⅛ | 1½ | ¼ | 1½ | 2 ¹³ / ₁₆ | 6 | 6 |
| 1¼ | 1 ⁵ / ₁₆ | 1¾ | ¼ | 1½ | 3¼ | 6½ | 7 |
| 1½ | 1½ | 1⅞ | ¼ | 1½ | 3½ | 7 | 8 |
| 2 | 1¾ | 2 | ¼ | 1½ | 3 ⁷ / ₈ | 8 | 9 |

Fig. 188

Two Hole Standoff Strap

Size Range: 3/4" through 2"

Finish: Zinc Plated Steel (Hot-Dip Galvanized optional)

Service: Hanger for CPVC pipe in the horizontal position on the bottom of structural wood beams and steel 20ga. min. (Fig. B). It can also be used as a guide to limit movement for a pipe in the horizontal/vertical position on the side of structural wood beams, composite wood beams and steel 20ga. min. (Fig. A).

Approvals: UL and ULC Listed.

Installation:

- Snap hanger over pipe.
- Position hanger back around pipe but allow for pipe movement.
- Secure hanger to mounting surface with screws provided. Recheck to insure that the pipe is allowed to move freely through hanger.
- Steel applications require two (2) #14 x 1" hex washer head self-drilling TEK screws. Not Supplied. Part Number STD-0090.

Features:

- Beveled edge design helps protect the CPVC pipe from any rough surface.
- Easily attaches to wood structure with #10 x 1" hex washer head self threading screw supplied with product. No pre-drilling required.
- Eliminates wooden spacer blocks.

Ordering: Specify CPVC pipe size, figure number and description.

Note: If UL listed restraint is required, use Anvil Fig. 188R (Formerly Afcon Fig. 514) on page 77.

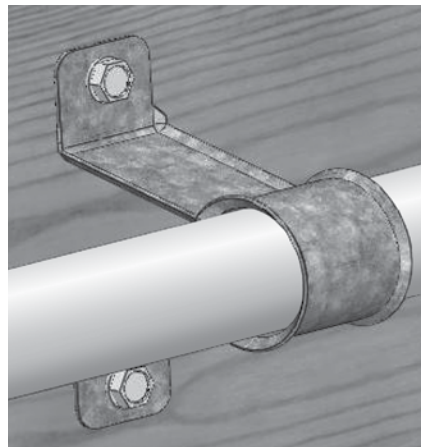
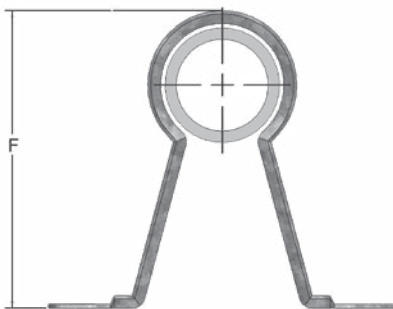
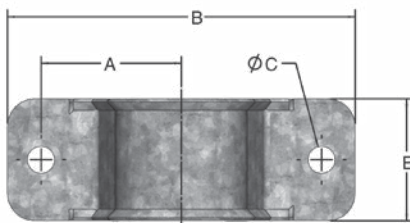
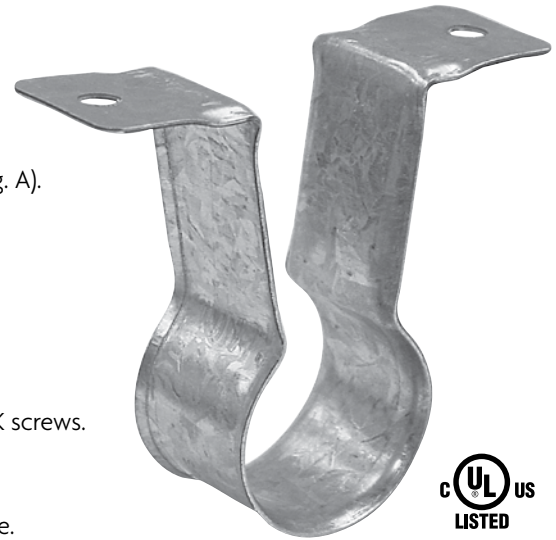


Fig. A

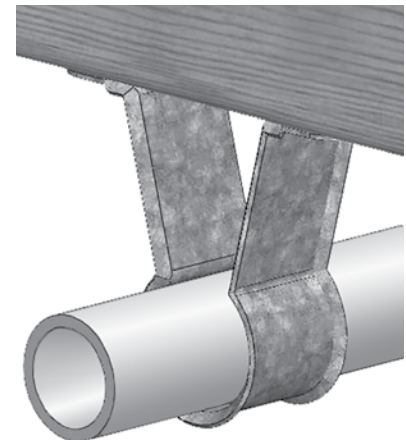


Fig. B

FIG. 188: DIMENSIONS (IN) • WEIGHT (LBS)

| CPVC Pipe Size | A | B | ØC | E | F | Max. Hanger Spacing (FT.) | Approx. Weight/100 (lbs) |
|----------------|--------|---------|-----|-------|--------|---------------------------|--------------------------|
| 3/4 | 1 1/16 | 3/4 | 1/4 | 1 1/8 | 2 3/4 | 5 1/2 | 5 |
| 1 | 1 3/8 | 3 3/8 | 1/4 | 1 1/8 | 3 | 6 | 6 |
| 1 1/4 | 1 1/2 | 3 11/16 | 1/4 | 1 1/8 | 3 3/16 | 6 1/2 | 7 |
| 1 1/2 | 1 7/8 | 4 3/8 | 1/4 | 1 1/8 | 3 3/16 | 7 | 8 |
| 2 | 2 | 4 1/2 | 1/4 | 1 1/8 | 4 1/8 | 8 | 9 |

Fig. 188R (Formerly Afcon Fig. 514) Two Hole Standoff and Restrainer

Size Range: 3/4" through 2"

Material: Carbon Steel

Finish: Pre-Galvanized per ASTM A653

Service:

- Hanger and surge restraint for horizontal CPVC, steel, and copper piping when installed on the top, bottom, and side of the supporting structure.
- Guide for vertical CPVC, steel, and copper piping when installed on the side of the supporting structure.
- Horizontal and vertical seismic restraint per NFPA 13-2016 requirements.
- May be installed with concrete, steel structural members, and other structural members with fasteners which comply with the requirements of NFPA 13.

Approvals: cULus Listed

Patents: No. 6,648,278

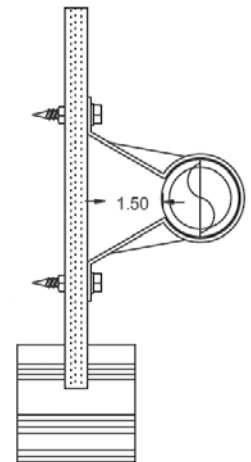
Installation:

- Snap hanger over pipe. If needed, squeeze strap back around pipe.
- CPVC pipe must be allowed to slide freely through the Fig. 188R.
- Secure hanger to mounting surface with screws provided or with listed fasteners.

Features:

- Beveled edge design helps protect the CPVC pipe from any rough surface and eliminates pipe abrasion.
- Easily attaches to wood structure with #10 x 1" hex washer head self-threading screw supplied with product. No pre-drilling required.
- Bottom of pipe is offset 1 1/2" from the structure. Eliminates wooden spacer blocks.

Ordering: Specify CPVC pipe size, figure number and description.



Installation - Backing Nut

Hanger = 1 - at top fastener

Restraint = 2 - on each fastener

Per NFPA-13D and NFPA-13R

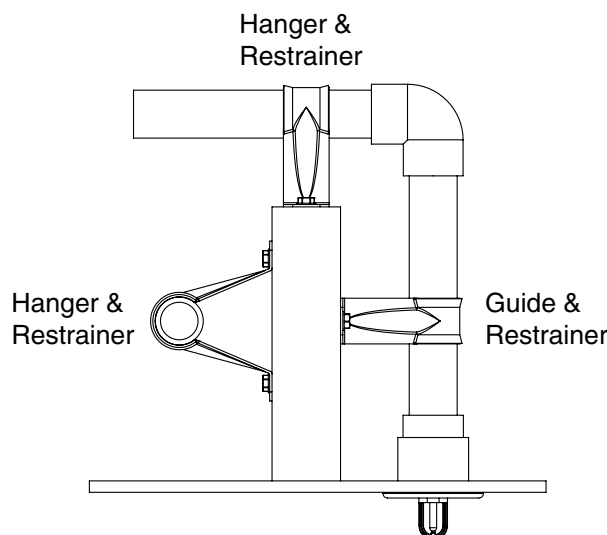
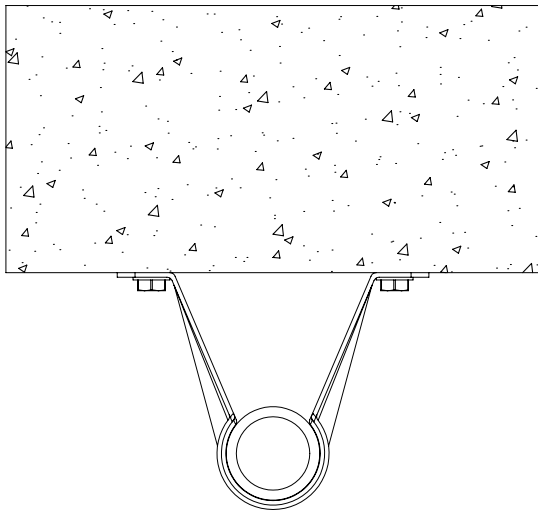


Fig. 188R (Formerly Afcon Fig. 514) **Two Hole Standoff and Restrainer** (cont.)



Hanger and Restrainer

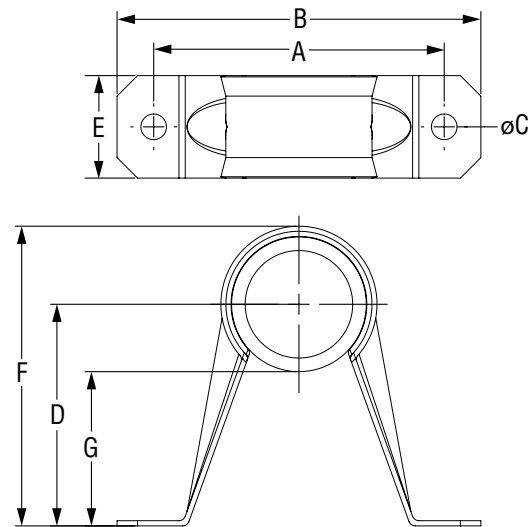


FIG. 188R: DIMENSIONS (IN) • WEIGHT (LBS)

| CPVC Pipe Size | A | B | øC | D | E | F | G | Max. Hanger Spacing (FT.) | Approx. Weight/100 (lbs) |
|----------------|---------|-------|-----|---------|---|---------|-------|---------------------------|--------------------------|
| 3/4 | 2 3/4 | 3 1/2 | 1/4 | 2 | 1 | 2 5/8 | 1 1/2 | 5 1/2 | 11 |
| 1 | 2 13/16 | 3 1/2 | 1/4 | 2 3/16 | 1 | 2 15/16 | 1 1/2 | 6 | 12 |
| 1 1/4 | 2 13/16 | 3 1/2 | 1/4 | 2 5/16 | 1 | 3 1/4 | 1 1/2 | 6 1/2 | 13 |
| 1 1/2 | 3 5/8 | 4 1/4 | 1/4 | 2 7/16 | 1 | 3 1/2 | 1 1/2 | 7 | 14 |
| 2 | 3 11/16 | 4 3/8 | 1/4 | 2 11/16 | 1 | 4 | 1 1/2 | 8 | 16 |

FIG. 188R: LISTED FASTENERS

| Pipe | Wood and Composite Beams | Steel (18ga. Minimum) |
|----------------|---|---|
| CPVC | Screw Supplied or #10 x 1" TEK Screw | #14 x 1" TEK Screw or 1/4" x 1" TEK Screw |
| Steel & Copper | #14 x 1" TEK Screw or 1/4" x 1 1/2" Lag Screw | #14 x 1" TEK Screw or 1/4" x 1" TEK Screw |

Fig. 595 (Formerly Afcon Fig. 850) Socket Clamp for Ductile Iron or Cast Iron Pipe

Size Range: 4" through 24"

Material: Two carbon steel half bands and four bolts and nuts.

Finish: Plain or Hot-Dip Galvanized with Zinc Plated Bolts & Nuts

Service: Clamps ductile or cast iron mechanical joint piping or mechanical joint or socket joint fittings together to prevent separation or distortion of pipe line under excessive water pressure.

Approvals: Complies with Federal Specification A-A-1192A (Type 8), ANSI/MSS SP-69 and MSS SP-58 (Type 8). Complies with the requirements of the National Fire Protection Association Standard NFPA-24 for Outside Protection.

Ordering: Specify pipe size, figure number, name and finish.

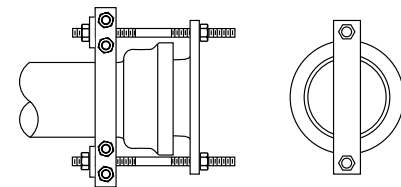
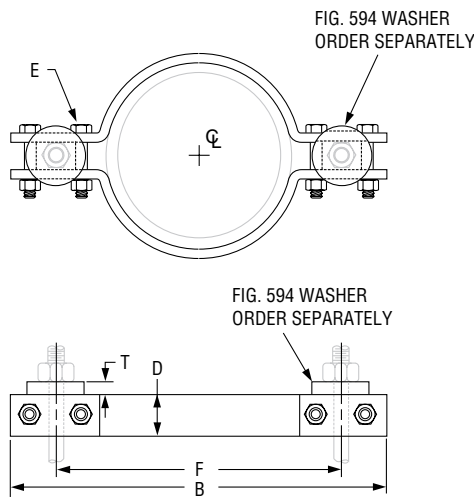


Fig. 594

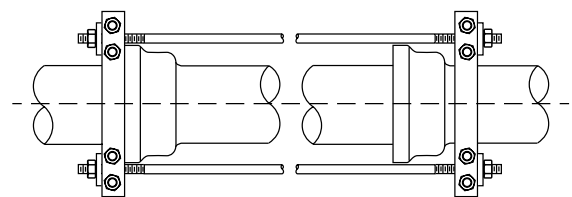
Socket Clamp Washer

Two cast iron or steel washers, Fig. 594, are used with each Fig. 595 socket clamp and these must be ordered separately.

Ordering: Specify washer size, figure number, name and finish.



Plug Strap for Bell End of Pipe



Pipe Anchor

FIG. 595, FIG. 594: DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS)

| D.I./C.I. Pipe Size | Max Test Pressure (PSI) | Force* On Clamp | Weight | | D.I.P. O.D. | B | D Width | Bolt Dia. E | F | T | Fig. 594 Washer Rod Dia. |
|---------------------|-------------------------|-----------------|----------------|-----------------|-------------|--------------------------------|-------------------------------|-------------------------------|--------------------------------|--------------------------------|-------------------------------|
| | | | Fig. 595 Clamp | Fig. 594 Washer | | | | | | | |
| 4 | 250 | 4,550 | 12.8 | 1.1 | 4.80 | 14 ⁵ / ₈ | 2 | 5/8 | 9 ⁵ / ₈ | 5/8 | 3/4 |
| 6 | | 9,340 | 14.6 | | 6.90 | 16 ⁷ / ₈ | | | 11 ⁷ / ₈ | | |
| 8 | | 16,080 | 23.6 | | 9.05 | 19 ¹ / ₈ | | | 14 ¹ / ₈ | | |
| 10 | | 24,180 | 29.3 | 1.7 | 11.10 | 21 ³ / ₈ | 2 ¹ / ₂ | 3/4 | 16 ⁵ / ₈ | 3/4 | 1 |
| 12 | | 34,230 | 40.3 | | 13.20 | 25 ¹ / ₈ | | | 19 ⁵ / ₈ | | |
| 14 | 120 | 22,200 | 53.9 | 2.7 | 15.80 | 28 ¹ / ₄ | 3 | 7/8 | 22 ³ / ₈ | 1 ¹ / ₈ | 1 ¹ / ₄ |
| 16 | 115 | 27,760 | 76.5 | | 17.40 | 31 ³ / ₈ | | | 4 | | |
| 18 | 100 | 23,900 | 94.3 | 4.3 | 19.50 | 35 ¹ / ₈ | 4 | 1 ¹ / ₄ | | 28 ¹ / ₈ | 1 ¹ / ₈ |
| 20 | 75 | 27,500 | 109.8 | | 21.60 | 37 ³ / ₄ | | | 4 ¹ / ₂ | 30 ¹ / ₂ | |
| 24 | 50 | 26,200 | 148.6 | 5.8 | 25.80 | 44 ¹ / ₄ | 5 | 1 ¹ / ₂ | 36 | 1 ¹ / ₄ | 1 ¹ / ₂ |

*Refers to Hydrostatic Test

Fig. 600

Socket Clamp for Ductile Iron or Cast Iron Pipe

Size Range: 3" through 24" pipe

Material: Two carbon steel halfbands and two bolts and nuts.

Finish: Plain or Hot-Dip Galvanized with EG Bolts & Nuts

Service: Clamps joints of socket fittings together to prevent distortion of pipe line under excessive water pressure.

Approvals: Complies with Federal Specification A-A-1192A (Type 8), ANSI/MSS SP-69 and MSS SP-58 (Type 8).

Features: An economical method of anchoring joints of socket fittings when used on other than fire protection work.

Ordering: Specify pipe size, figure number, name and finish.



Fig. 599

Socket Clamp Washer

Two cast iron or steel washers, Fig. 599, are used with each Fig. 600 socket clamp and these must be ordered separately.

Ordering: Specify washer size, figure number, name and finish.

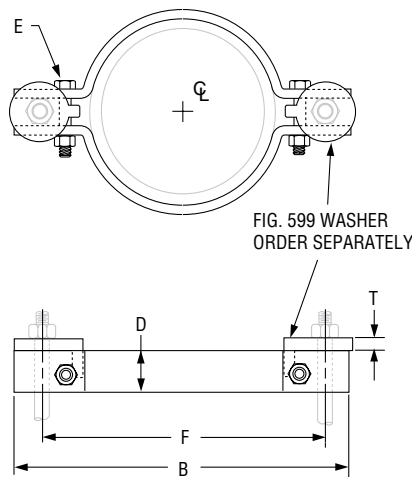


FIG. 600, FIG. 599: DIMENSIONS (IN) • WEIGHT (LBS)

| D.I./C.I. Pipe Size | Weight | | D.I.P. O.D. | B | D Width | Bolt Dia. E | F | T | Fig. 599: Washer Rod Dia. |
|------------------------|--------------------|---------------------|----------------|--------------------------------|-------------------------------|-------------------------------|--------------------------------|-------------------------------|---------------------------------|
| | Fig. 600: Clamp | Fig. 599: Washer | | | | | | | |
| 3 | 9.7 | 1.2 | 3.96 | 11 ⁵ / ₈ | 2 | 5/8 | 8 ⁵ / ₈ | 5/8 | 3/4 |
| 4 | 11.0 | | 4.80 | 12 ¹ / ₈ | | | 9 ³ / ₄ | | |
| 6 | 12.7 | | 6.90 | 14 ³ / ₈ | | | 12 | | |
| 8 | 14.5 | | 9.05 | 16 ⁵ / ₈ | | | 14 ¹ / ₄ | | |
| 10 | 16.3 | | 11.10 | 18 ⁷ / ₈ | | | 16 ¹ / ₂ | | |
| 12 | 18.3 | | 13.80 | 21 ¹ / ₄ | | | 18 ⁷ / ₈ | | |
| 14 | 48.7 | 2.7 | 15.80 | 25 ¹ / ₂ | 3 | 7/8 | 23 | 1 ¹ / ₈ | 1 ¹ / ₄ |
| 16 | 69.2 | | 17.40 | 28 | 4 | 1 | 25 ¹ / ₂ | | |
| 18 | 82.0 | 4.5 | 19.50 | 31 ¹ / ₂ | 4 ¹ / ₂ | 1 ¹ / ₄ | 27 ⁷ / ₈ | | |
| 20 | 97.5 | | 21.60 | 33 ³ / ₄ | | | 29 ³ / ₄ | | |
| 24 | 132.0 | 6.8 | 25.80 | 39 ³ / ₄ | 5 | 1 ¹ / ₂ | 35 ¹ / ₄ | 1 ¹ / ₄ | 1 ¹ / ₂ |

Fig. 86: C-Clamp with Set Screw and Lock Nut

Fig. 88: C-Clamp with Set Screw Only

C-Clamp

Size Range: $\frac{3}{8}$ " through $\frac{3}{4}$ "

Material: Malleable iron clamp; hardened steel cup point set screw.

Finish: Plain or Zinc Plated (Hot-Dip Galvanized optional)

Service: Recommended for attachment to "W" and "M" beams where thickness of flange Z (see table on page 289) does not exceed 0.75". When clamp is used with Fig. 89 retaining clip, flange thickness may not exceed 0.62".

Approvals: Complies with Federal Specification A-A-1192A (Type 23), WW-H-171-E (Type 23), ANSI/MSS SP-69 and MSS SP-58 (Type 23), UL, ULC Listed (Sizes $\frac{3}{8}$ ", $\frac{1}{2}$ ", $\frac{5}{8}$ " and $\frac{3}{4}$ ") and FM Approved (Sizes $\frac{3}{8}$ ").

Installation: Follow recommended set screw torque values per MSS-SP-69 (See table on page 288). The Fig. 88 is only to be used on installations where the clamp cannot become dislodged from the beam.

Features:

- Malleable body assures:
 - Uniform quality and strength.
 - Full thread engagement.
- Hardened steel cup point set screw for securing to beam flange.
- Ribbed design of clamp provides added strength.

Ordering: Specify rod size, figure number, name, length of retaining clip, if desired.

(Add 2" to flange width of beam to arrive at proper length of retaining clip.)

If required length is not standard, order next longer standard.



Fig. 86

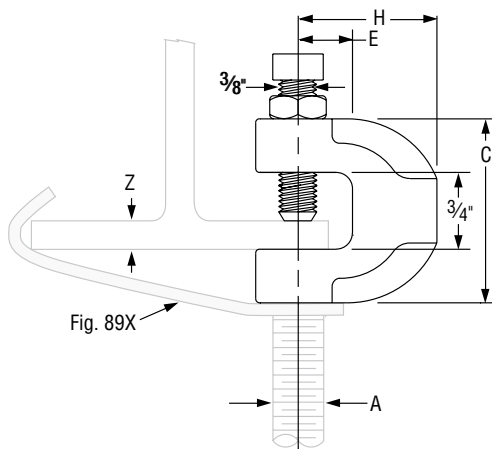


Fig. 86

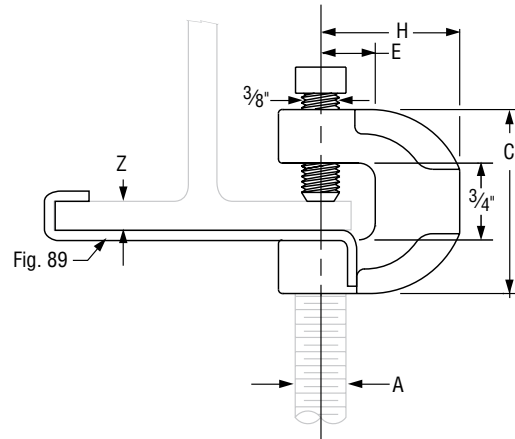


Fig. 88

FIG. 86 AND FIG. 88: DIMENSIONS (IN) • LOADS (LBS) • TORQUE (IN-LBS) • WEIGHT (LBS)

| Rod Size A | Torque Value | Max Load ■ | C | E | H | Weight | |
|---------------|--------------|------------|----------------|---------------|----------------|---------|---------|
| | | | | | | Fig. 86 | Fig. 88 |
| $\frac{3}{8}$ | 60 | 400 | $1\frac{3}{4}$ | $\frac{5}{8}$ | $1\frac{3}{8}$ | 0.28 | 0.26 |
| $\frac{1}{2}$ | 60 | | | | | 0.31 | 0.29 |
| $\frac{5}{8}$ | 60 | 440 | 2 | $\frac{3}{4}$ | $1\frac{1}{2}$ | 0.42 | 0.40 |
| $\frac{3}{4}$ | 60 | 500 | | | | 0.55 | 0.53 |

■ Maximum temperature of 450° F.

Fig. 89

Retaining Clip

Size Range: $\frac{3}{8}$ " through $\frac{1}{2}$ "

Material: Carbon steel

Finish: Plain or Zinc Plated (Hot-Dip Galvanized optional)

Service: For use with Figs. 86, 88 & 95. NOT for seismic applications.

How to size: Specify length of retaining strap based on beam size.

Installation: Length of strap should be adequate to allow at least 1" of strap to be bent over the beam side of the flange opposite the side the beam clamp is mounted on.

Ordering: Specify rod size, figure number, name, length of retaining clip and finish (Add 2" to flange width of beam to arrive at proper length of retaining clip).

If required length is not standard, order next longer standard.

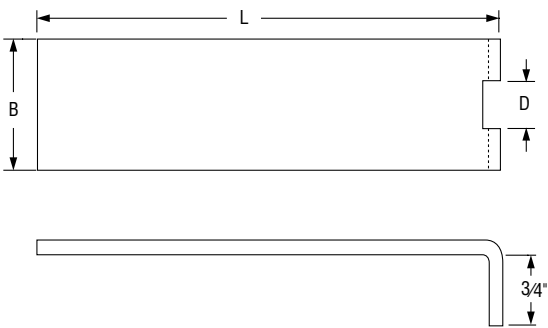
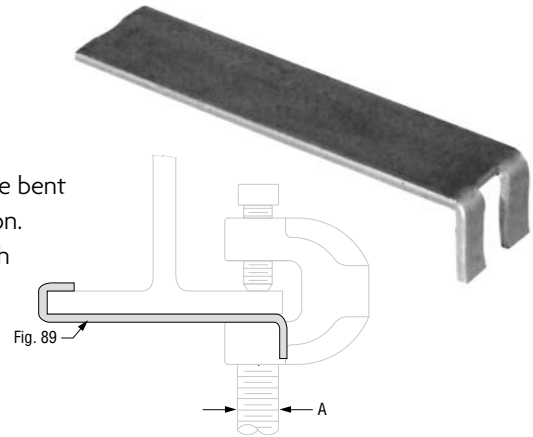


FIG. 89: RETAINING CLIP: DIMENSIONS (IN) • WEIGHT (LBS)

| Rod Size A | B | D | Weights | | | | Length L |
|---------------|----|-----------------|---------|------|------|------|------------------|
| | | | 4½ | 8 | 10 | 14 | |
| $\frac{3}{8}$ | 1 | $\frac{7}{16}$ | 0.17 | 0.28 | 0.35 | 0.53 | 4½, 8, 10, 14 |
| $\frac{1}{2}$ | 1¼ | $\frac{15}{32}$ | 0.22 | 0.37 | 0.46 | 0.63 | |
| $\frac{5}{8}$ | 1¾ | $\frac{11}{16}$ | 0.25 | 0.43 | 0.51 | 0.73 | |
| $\frac{3}{4}$ | | | | | | | |

Fig. 89X (Formerly Afcon Fig. 160)

Retaining Clip

Size Range: $\frac{3}{8}$ " through $\frac{3}{4}$ "

Material: Carbon steel

Finish: Zinc Plated (Hot-Dip Galvanized optional)

Service: For use with Figs. 86, 88, 92, 93, 94 & 95 in seismic applications.

Approvals: Complies with MSS-SP-127. UL and ULC Listed.

How to size: Specify length of retaining strap based on beam size.

Installation: Length of strap should be adequate to allow at least 1" of strap to be bent over the beam side of the flange opposite the side the beam clamp is mounted on.

Ordering: Specify rod size, figure number, name, length of retaining clip and finish (Add 2" to flange width of beam to arrive at proper length of retaining clip).

If required length is not standard, order next longer standard.

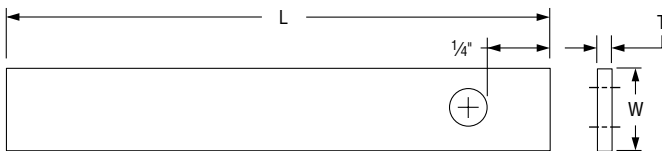
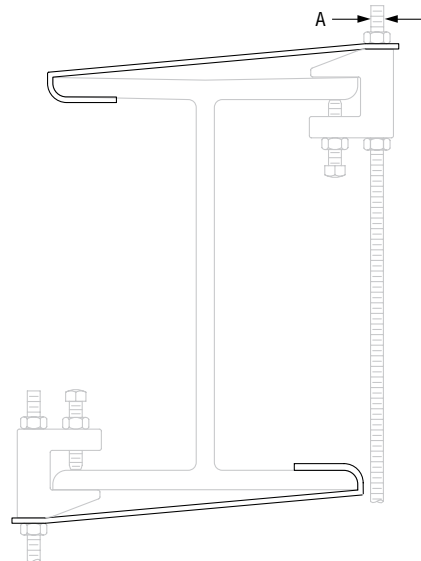


FIG. 89X: DIMENSIONS (IN) • WEIGHT (LBS)

| Rod Size A | Width W | T | Weight | | | | Length L |
|---------------|------------|-------|--------|------|------|------|-----------------|
| | | | 6 | 8 | 10 | 14 | |
| $\frac{3}{8}$ | 1 | 0.058 | 0.10 | 0.14 | 0.17 | 0.24 | 6, 8, 10, 14 |
| $\frac{1}{2}$ | | | | | | | |
| $\frac{5}{8}$ | 1¼ | 0.070 | 0.13 | 0.17 | 0.22 | 0.31 | |
| $\frac{3}{4}$ | | | | | | | |

Fig. 92 (Formerly Afcon Fig. 100) Universal C-type Clamp (Standard Throat)

Size Range: 3/8" and 1/2"

Material: Ductile iron, hardened steel cup point set screw and locknut.

Finish: Plain or Zinc Plated (Hot-Dip Galvanized optional)

Service: Recommended for use under roof installations with bar joist type construction, or for attachment to the top or bottom flange of structural shapes where the vertical hanger rod is required to be offset from the edge of the flange and where the thickness of joist or flange does not exceed 3/4".

Approvals: Complies with Federal Specification A-A-1192A (Type 19 & 23)

WW-H-171-E (Type 23), ANSI/MSS SP-69 and MSS SP-58 (Type 19 & 23).

UL, ULC Listed and FM Approved.

How to size: Size of clamp is determined by size of rod to be used.

Installation: Follow recommended set screw torque values per MSS-SP-69 (See table on page 288).

Features:

- They may be attached to horizontal flanges of structural members in either the top beam or bottom beam positions.
- Secured in place by a cup-pointed Set Screw tightened against the flange. A Jam Nut is provided for tightening the Set Screw against the Body Casting.
- Thru tapping of the body casting permits extended adjustment of the threaded rod.
- Can be used with Fig 89X retaining clip for seismic applications.

Ordering: Specify rod size, figure number, name of clamp and finish.

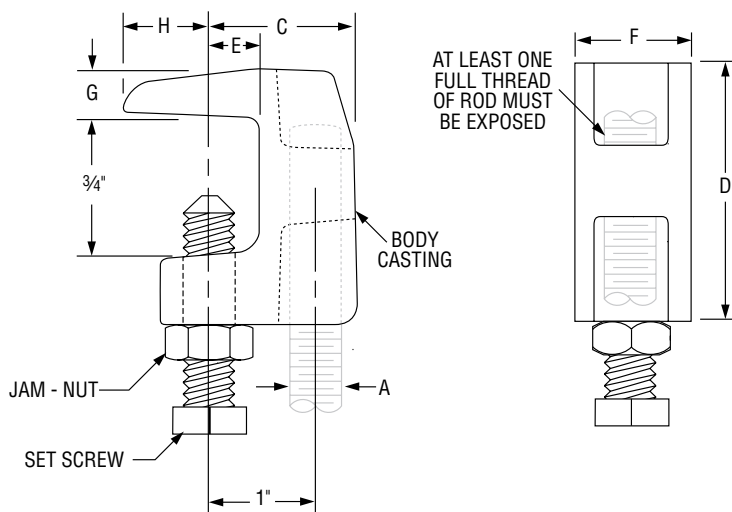
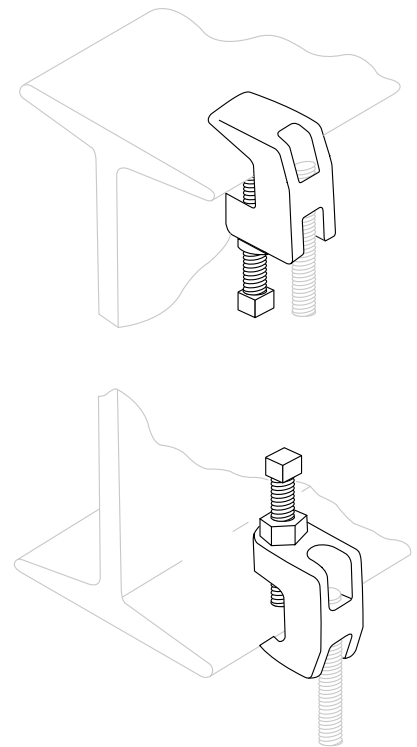


FIG. 92: DIMENSIONS (IN) • LOAD (LBS) • TORQUE (IN-LBS) • WEIGHT (LBS)

| Rod Size A | Set Screw Size | Torque Value | Max Loads ■ | | Weight | C | D | E | F | G | H |
|---------------|-------------------|-----------------|-------------|--------|--------|--------|---------|------|--------|------|-------|
| | | | Top | Bottom | | | | | | | |
| 3/8 | 3/8 | 60 | 500 | 250 | 0.34 | 1 5/16 | 1 1/16 | 9/16 | 1 3/16 | 3/8 | 1/2 |
| 1/2 | 1/2 | 125 | 950 | 760 | 0.63 | 1 3/8 | 1 13/16 | 1/2 | 1 1/16 | 7/16 | 23/32 |

■ Maximum temperature of 450° F

Fig. 93 (Formerly Afcon Fig. 105)

Universal C-type Clamp (Wide Throat)

Size Range: $\frac{3}{8}$ " and $\frac{1}{2}$ "

Material: Ductile iron clamp, hardened steel cup point set screw and locknut.

Finish: Plain or Zinc Plated (Hot-Dip Galvanized optional)

Service: Recommended for use under roof installations with bar joist type constructions, or for attachment to the top or bottom flange of structural shapes where the vertical hanger rod is required to be offset from the edge of the flange and where the thickness of joist or flange does not exceed $1\frac{1}{4}$ ".

Approvals: Complies with Federal Specification A-A-1192A (Type 19 & 23), WW-H-171-E (Type 23), ANSI/MSS SP-69 and MSS SP-58 (Type 19 & 23). UL, ULC Listed and FM Approved.

How to size: Size of clamp is determined by size of rod to be used.

Installation: Follow recommended set screw torque values per MSS-SP-69 (See tables on page 288).

Features:

- They may be attached to horizontal flanges of structural members in either the top beam or bottom beam positions.
- Secured in place by a cup-pointed Set Screw tightened against the flange. A Jam Nut is provided for tightening the Set Screw against the Body Casting.
- Thru tapping of the body casting permits extended adjustment of the threaded rod.
- Wider throat for attaching to flange with up to $1\frac{1}{4}$ " thickness.

Ordering: Specify rod size, figure number, name of clamp and finish.

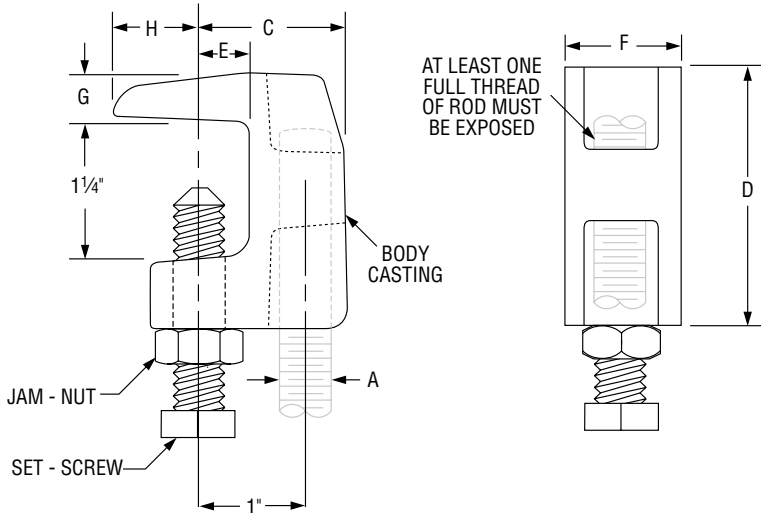
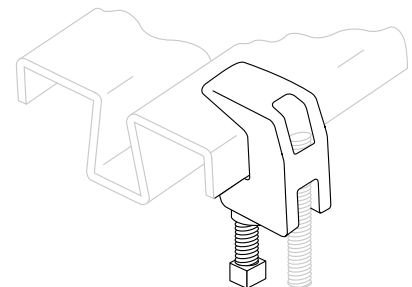
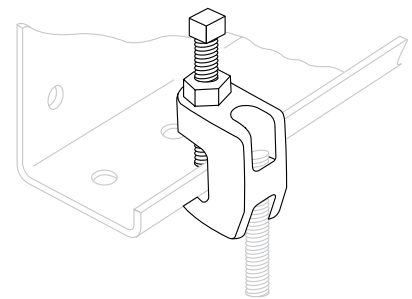
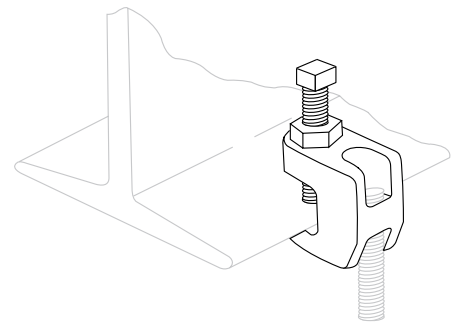


FIG. 93:
DIMENSIONS (IN) • LOAD (LBS) • TORQUE (IN-LBS) • WEIGHT (LBS)

| Rod Size A | Set Screw Size | Torque Value | Max Loads ■ | | Weight | C | D | E | F | G | H |
|---------------|----------------|--------------|-------------|--------|--------|-----------------|------------------|----------------|------------------|----------------|------------------|
| | | | Top | Bottom | | | | | | | |
| $\frac{3}{8}$ | $\frac{3}{8}$ | 60 | 500 | 250 | 0.41 | $1\frac{5}{16}$ | $2\frac{5}{32}$ | $\frac{9}{16}$ | $1\frac{13}{16}$ | $\frac{3}{8}$ | $\frac{5}{8}$ |
| $\frac{1}{2}$ | $\frac{1}{2}$ | 125 | 950 | 760 | 0.75 | $1\frac{3}{8}$ | $2\frac{11}{32}$ | $\frac{1}{2}$ | $1\frac{1}{16}$ | $\frac{7}{16}$ | $1\frac{13}{16}$ |

■ Maximum temperature of 450° F

Fig. 94

Wide Throat Top Beam C-Clamp

Size Range: 5/8" and 3/4"

Material: Ductile iron body, hardened steel cup point set screw and locknut.

Finish: Plain or Zinc Plated (Hot-Dip Galvanized optional)

Service: Recommended for use under roof installations with bar joist type construction, or for attachment to the top flange of structural shapes where the vertical hanger rod is required to be offset from the edge of the flange and where the thickness of joists or flange does not exceed 1 5/16".

Approvals: Complies with Federal Specification A-A-1192A (Type 19) WW-H-171-E (Type 19), ANSI/MSS SP-69 and MSS SP-58 (Type 19), UL Listed.

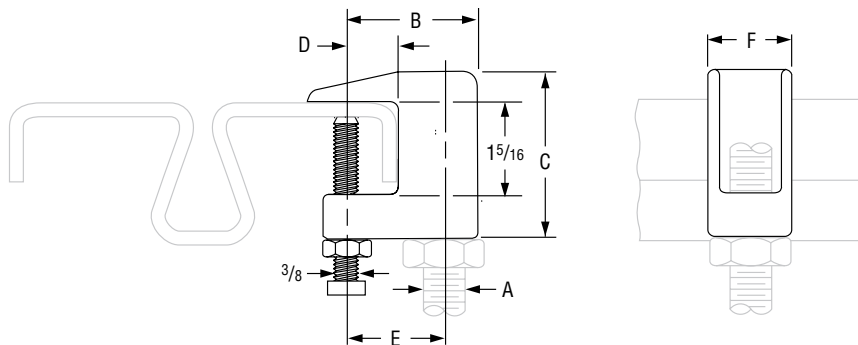
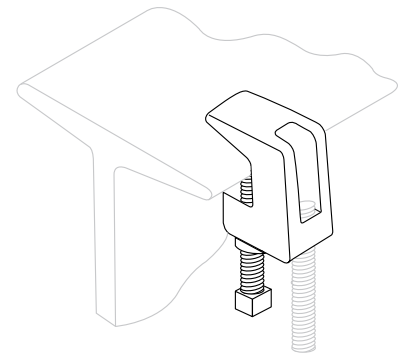
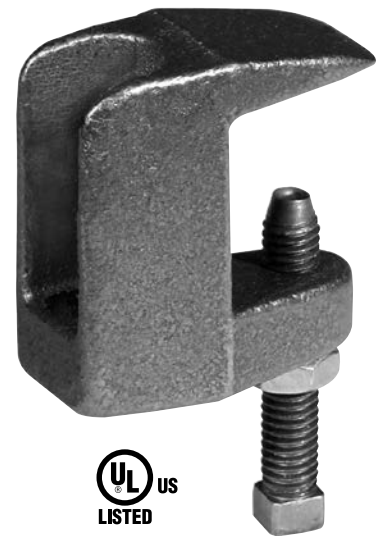
How to size: Size of clamp is determined by size of rod to be used.

Installation: Follow maximum recommended set screw torque values per MSS-SP-69. (See tables on page 288)

Features:

- Provides clamping to bar joists which are directly under roof installations.
- Provides for vertical hanger rod installed offset from the edge of the beam flange.
- Malleable iron body assures full thread engagement of rod.

Ordering: Specify rod size, figure number, name of clamp and finish.



| FIG. 94: DIMENSIONS (IN) • LOAD (LBS) • TORQUE (IN-LBS) • WEIGHT (LBS) | | | | | | | | | |
|--|----------------|--------------|-------------|--------|-------|-------|-----|-------|--------|
| Rod Size A | Set Screw Size | Torque Value | Max Loads ■ | Weight | B | C | D | E | F |
| 5/8 | 3/8 | 60 | 1,200 | 0.66 | 1 3/4 | 2 1/4 | 3/4 | 1 1/4 | 1 |
| 3/4 | 3/8 | 60 | 1,600 | 0.83 | 1 7/8 | 2 3/8 | | 1 3/8 | 1 1/16 |

■ Maximum temperature of 450° F

Fig. 95

C-Clamp with Locknut

Size Range: $\frac{3}{8}$ " and $\frac{1}{2}$ "

Material: Carbon Steel

Finish: Plain or Zinc Plated

Service: Designed for fastening flange of "W" and "M" beam. Bottom hole tapped to accommodate hanger rod.

Approvals: Complies with Federal Specification A-A-1192A (Type 23) WW-H-171-E (Type 23), ANSI/MSS SP-69 and MSS SP-58 (Type 23).

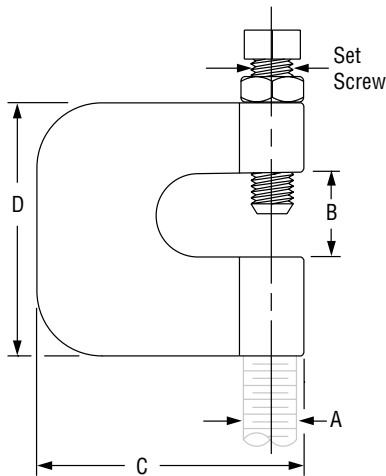
UL Listed (Sizes $\frac{3}{8}$ ").

FM Approved (Sizes $\frac{3}{8}$ " - $\frac{1}{2}$ ").

Installation: Follow recommended set screw torque values per MSS-SP-69 (See table on page 288).

Ordering: Specify rod size, figure number, name and finish.

Note: If a retaining clip is desired, you may specify either Fig. 89X or Fig. 89. For length and other ordering information, refer to Fig. 89X and Fig. 89.



| FIG. 95: DIMENSIONS (IN) • LOAD (LBS) • TORQUE (IN-LBS) • WEIGHT (LBS) | | | | | | | | Rod Sized Retaining Clips | |
|--|----------------|--------------|----------|---------------|----------------|----------------|--------|---------------------------|---------------|
| Rod Size A | Set Screw Size | Torque Value | Max Load | B | C | D | Weight | Fig. 89 | Fig. 89X |
| $\frac{3}{8}$ | $\frac{3}{8}$ | 60 | 230 | $\frac{3}{4}$ | $2\frac{1}{4}$ | $2\frac{3}{8}$ | 0.34 | $\frac{3}{8}$ | $\frac{3}{8}$ |
| $\frac{1}{2}$ | $\frac{1}{2}$ | 125 | 380 | | | | 0.40 | | $\frac{1}{2}$ |

Fig. 133 Fig. 134

Standard Duty Beam Clamp Heavy Duty Beam Clamp

Size Range: Fig. 133: 4" through 8"; Fig. 134: 4" through 12"

Material: Carbon steel

Finish: Plain or Hot-Dip Galvanized with Zinc Plated Fasteners

Service: Clamp centers the load on beam to prevent distortion

Approvals: Complies with Federal Specification A-A-1192A (Type 21) WW-H-171-E (Type 21), ANSI/MSS SP-69 and MSS SP-58 (Type 21).

Fig. 133 UL Listed when used with $\frac{3}{8}$ " and $\frac{1}{2}$ " rod.

Fig. 134 UL Listed and FM Approved when used with $\frac{1}{2}$ " and $\frac{5}{8}$ " rod.

Components: Two half-clamps, pipe spacer and bolt with nut assembled.

Ordering: Figure number, width of flange, name and finish.

Note: Spacer is furnished for use with Fig. 290 weldless eye nuts. Spacer may be removed for use with Fig 278 eye rods.



Fig. 133
Standard Duty

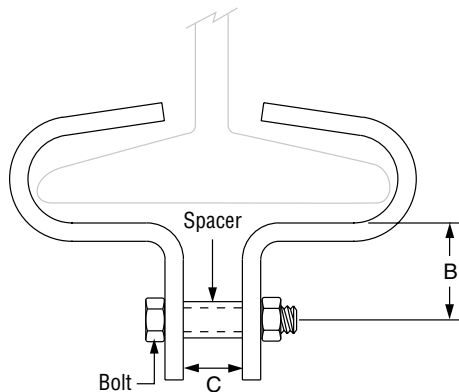


Fig. 134
Heavy Duty



| Flange Size | | | |
|--------------|----------------------|--------------------|---------------------|
| Flange Width | Max Flange Thickness | Weight (lbs) | |
| | | Fig. 133 Std. Duty | Fig. 134 Heavy Duty |
| 4 | $\frac{1}{2}$ | 0.91 | 3.82 |
| 5 | $\frac{3}{8}$ | 1.00 | 4.35 |
| 6 | $\frac{3}{4}$ | 1.15 | 4.52 |
| 7 | $\frac{7}{8}$ | 1.29 | 4.84 |
| 8 | | 1.44 | 5.10 |
| 9 | 1 | — | 5.83 |
| 10 | | — | 6.25 |
| 11 | | — | 6.67 |
| 12 | | — | 7.09 |

| FIG. 133, 134: DIMENSIONS (IN) • LOADS (LBS) | | | | | |
|--|----------------|----------------|---------------|-----------------|----------|
| | C | B | Bolt Size | Spacer O.D. | Max Load |
| Fig. 133 | $\frac{9}{16}$ | $1\frac{3}{8}$ | $\frac{3}{8}$ | $1\frac{1}{16}$ | 1,000 |
| Fig. 134 | $\frac{3}{4}$ | $2\frac{1}{4}$ | $\frac{5}{8}$ | $1\frac{1}{16}$ | 3,000 |

Fig. 14

Adjustable Side Beam Clamp

Size Range: $\frac{3}{8}$ " through $\frac{5}{8}$ "

Material: Carbon steel

Finish: Plain or Zinc Plated

Service: Recommended for supporting pipe from the bottom flange of beam

Approvals: Complies with Federal Specification A-A-1192A (Type 27)

WW-H-171-E (Type 54), ANSI/MSS SP-69 and MSS SP-58 (Type 27).

Ordering: Specify rod size, figure number, name and finish.

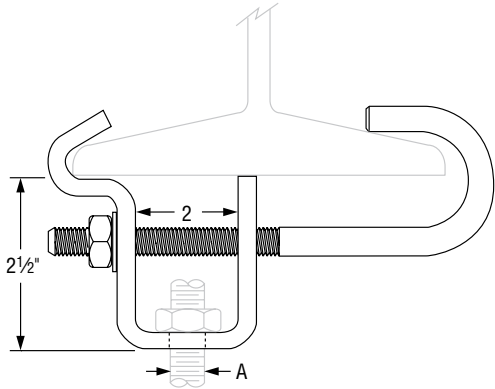


FIG. 14: DIMENSIONS (IN) • LOAD (LBS) • WEIGHT (LBS)

| Rod Size A | Max Load | Hole Size A | Adjustment Beam Width | | Weight |
|---------------|-------------|-----------------|--------------------------|------|--------|
| | | | Min. | Max. | |
| $\frac{3}{8}$ | 300 | $\frac{7}{16}$ | 3½ | 8 | 1.19 |
| $\frac{1}{2}$ | 700 | $\frac{9}{16}$ | | | 1.67 |
| $\frac{5}{8}$ | 1,000 | $\frac{11}{16}$ | | | 2.23 |

Fig. 217

Adjustable Side Beam Clamp

Size Range: 3" through $7\frac{5}{8}$ "

Material: Carbon steel

Finish: Plain

Service: To be used where it is necessary for the hanger rod to run vertically close to the beams edge, eliminating drilling of holes in structural members.

Components: Top slide, bottom hook, nut and bolt – assembled.

Design: Can be adjusted to fit various beam flange widths and thicknesses.

Approvals: Complies with Federal Specification A-A-1192A (Type 25), ANSI/MSS SP-69 and MSS SP-58 (Type 25).

Ordering: Specify size, figure number, type, name.

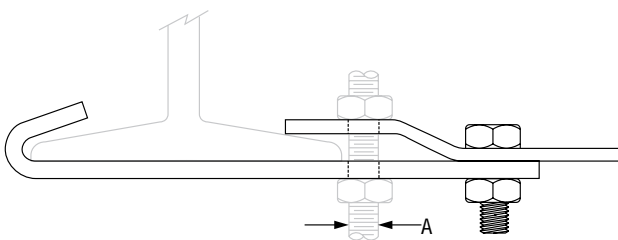


FIG. 217: DIMENSIONS (IN) • LOAD (LBS) • WEIGHT (LBS)

| Size | Max Flange Width | Max Flange Thickness | Rod Size A | Max Load | Weight |
|--------------------------|---------------------|-------------------------|---------------|-------------|--------|
| Fig. 217 - Type 1 | | | | | |
| 3 | 3 - 4½ | ½ | $\frac{3}{8}$ | 300 | 0.80 |
| 4½ | 4½ - 6 | 1¼ | | | 1.06 |
| 6½ | 6½ - 7½ | ¾ | | | 1.17 |
| 7½ | 7½ - 9 | 1½ | | | 1.28 |
| Fig. 217 - Type 2 | | | | | |
| 3 | 3 - 4½ | ½ | ½ | 500 | 1.57 |
| 4½ | 4½ - 6 | 1¼ | | | 1.84 |
| 6½ | 6½ - 7½ | ¾ | | | 2.05 |
| 7½ | 7½ - 9 | 1½ | | | 2.23 |
| Fig. 217 - Type 3 | | | | | |
| 3 | 3 - 4½ | ½ | $\frac{5}{8}$ | 700 | 3.75 |
| 4½ | 4½ - 6 | 1¼ | | | 4.19 |
| 6½ | 6½ - 7½ | ¾ | | | 4.53 |
| 7½ | 7½ - 9 | 1½ | | | 5.11 |

Fig. 218

Malleable Beam Clamp without Extension Piece

Material: Malleable iron jaw, steel tie rod, nuts and washer.

Finish: Plain or Zinc Plated

Service: Recommended for attachment to structural steel. Use in conjunction with beams where beam widths are from 2 3/8" minimum to 7" maximum and flange thickness does not exceed 0.60".

Approvals: Complies with Federal Specification A-A-1192A (Type 30) WW-H-171-E (Type 30), ANSI/MSS SP-69 and MSS SP-58 (Type 30). UL, ULC Listed (Sizes 3/4" - 12" pipe size, when used with the Fig. 157 extension piece 3/8" - 7/8" rod sizes). FM Approved (Sizes 3/4" - 4" pipe size, when used with the Fig. 157 extension piece 3/8" rod size).

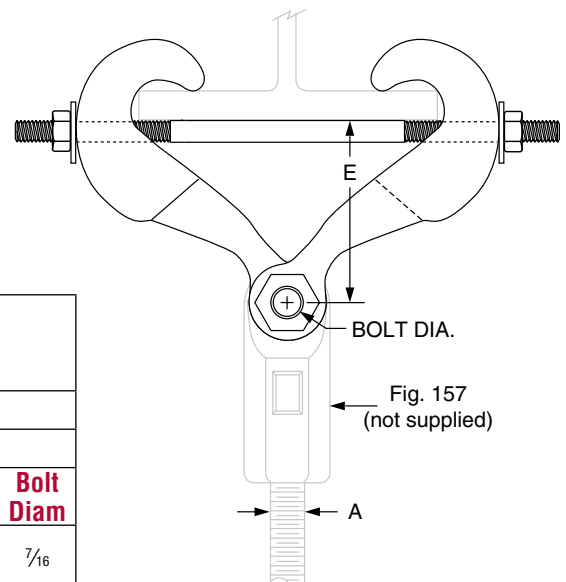
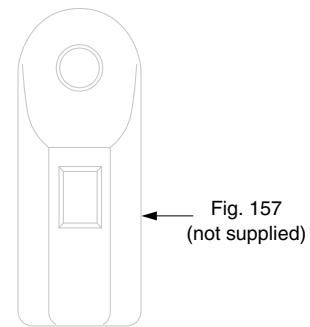
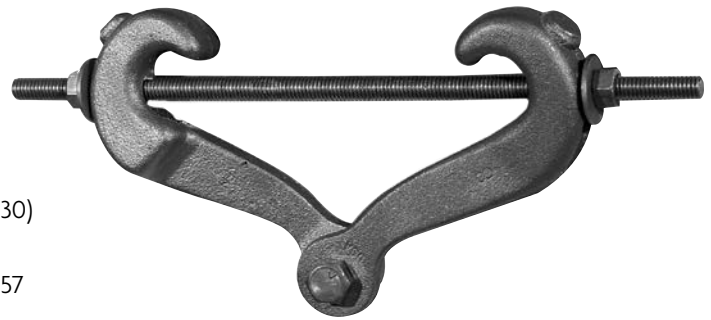
Installation: The malleable beam clamp Fig. 218 may be used with an eye rod, or Fig. 157 extension piece.

Features:

- Functional design insures proper fit for all beam sizes.
- Tie rod locks clamp in place when nuts are tightened.
- Ordering and stocking simplified because of one universal size.
- Design allows hanger rod to swing from vertical providing flexibility at the beam clamp.

Ordering: Specify figure number, name and finish.

Note: When used with Fig. 157 see page 129 extension piece, an additional inch or more of vertical adjustment is obtained.



| FIG. 218: DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS) | | | | | | | | | |
|---|------------|--------|---------------------------|--------|--------|---------|--------|-------|-----------|
| Max Rod Size A | Max Load ■ | Weight | Width of Beam Flange (in) | | | | | | |
| | | | Rod Take Out - E (in) | | | | | | |
| | | | 2 3/8 | 3 | 4 | 5 | 6 | 7 | Bolt Diam |
| 7/8 | 1,365 | 2.2 | 3 1/2 | 3 7/16 | 3 5/16 | 2 15/16 | 2 9/16 | 1 7/8 | 7/16 |

■ Note: see page 288 for load capacity of rod.

Fig. 226 (Formerly Afcon Fig. 142)

Truss Bracket

Rod Size: 1/2"

Material: Carbon Steel

Finish: Plain or Electro-Galvanized per ASTM B633

Service:

- For installation on the top chord of a steel web joist. Web thickness must be between 3/16" and 3/8" thick. Joist must be between 5" and 7" wide.
- For installation with Anvil Fig 202, 206, 207, & 551 brackets

Approvals: cULus Listed for up to 8" service pipe

Installation:

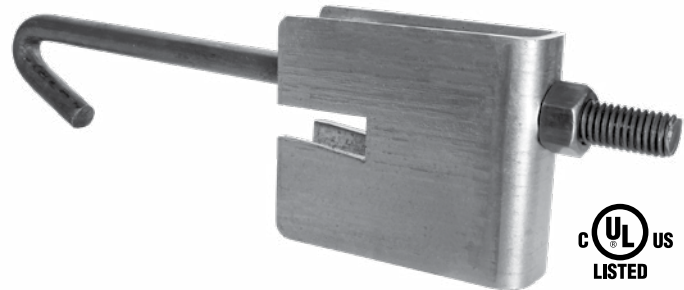
- Place rod hook and the steel bracket over the top chord
- Mount a bracket with a 1/2" mounting hole over the rod exposed behind the steel bracket. 3/8" Hanger rod, use Fig. 551 Revolver Bracket or a Fig. 207 - 3/8". 1/2" Hanger Rod, use Fig. 202 - 1/2", Fig. 206 and Fig. 207 Side Beam Brackets.
- Tighten hex nut between 10 and 12 ft-lbs or finger tight plus 1/2 turn.

Features:

- Offsets hanger from the joist to allow for clearance between the pipe and joist.
- Possible alternative to a trapeze assembly.

Patent: No. 6,898,905

Ordering: Specify figure number, description and finish.



| FIG. 226: THREADED ROD OFFSET (IN) | | | |
|------------------------------------|-------------|----------------|---------------|
| Bracket Figure Number | Thread Size | Bracket Offset | Total Offset* |
| 551 | 3/8" | 3/4" | 3" |
| 207 | 3/8" | 15/16" | 3 3/16" |
| 207 | 1/2" | 1 1/8" | 3 3/8" |
| 206 | 1/2" | 1 7/16" | 3 11/16" |
| 202 | 1/2" | 1 3/16" | 3 7/16" |

* Total offset from center of the rod to the edge of the beam.

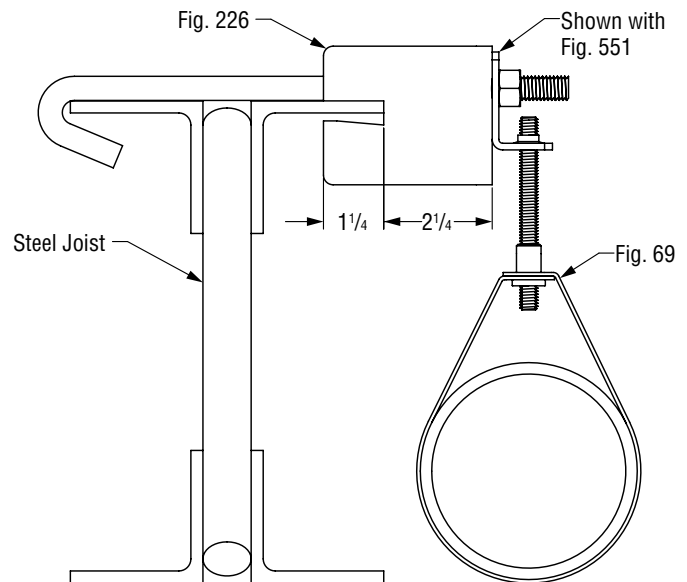


Fig. 227 (Formerly Afcon Fig. 140)

Top Beam Clamp

Material: Carbon steel jaw, hook rod with nut, lock washer and plain washer.

Finish: Plain

Service: Recommended for use on top flange of beam and roof trusses where the flange thickness does not exceed 0.81".

Approvals: Complies with Federal Specification A-A-1192A (Type 25), ANSI/MSS SP-69 and MSS SP-58 (Type 25). UL Listed (rod sizes $\frac{3}{8}$ " & $\frac{1}{2}$ ") and FM Approved when used with $\frac{3}{8}$ " rod size.

How to size: Determine hook rod length by adding figure in column headed "x" to flange width (see table on page 289 for flange width). "x" is not indicated as a dimension on drawing.

Installation: Slide stamped steel jaw over beam flange and attach hook rod and eye rod, finally tightening hook rod. Hammer jaw firmly against the underside of the beam to complete installation.

Features:

- Two jaw sizes fit beam flanges thickness from 0.25" to 0.81".
- Clamp firmly holds to beam providing safe and extremely economical means of supporting small piping from the top flange of steel beams and roof trusses.

Ordering: Specify jaw size, figure number, name, hook rod length.

Standard hook rods are furnished in even inch lengths, either length ordered or next longer length.

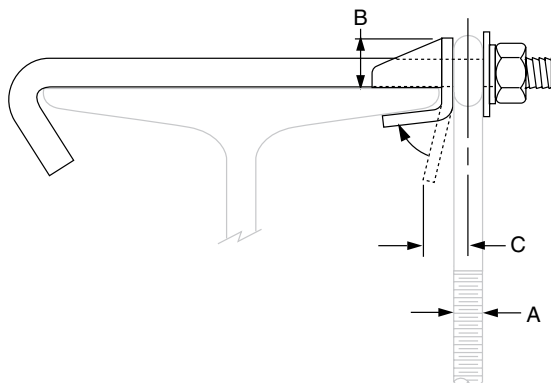
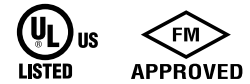


FIG. 227: DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS)

| Jaw Size | Max Load | Weight ▲ | Hook Rod Diam | Rod Size A | B | C | X |
|----------|----------|----------|---------------|---------------|----------------|----------------|----------------|
| 1 | 730 | 0.38 | $\frac{3}{8}$ | $\frac{3}{8}$ | $\frac{3}{4}$ | $\frac{5}{16}$ | $2\frac{1}{8}$ |
| 2 | 940 | 0.67 | $\frac{1}{2}$ | $\frac{1}{2}$ | 1 | $\frac{3}{8}$ | $2\frac{1}{4}$ |
| | | | | $\frac{5}{8}$ | $1\frac{1}{8}$ | $\frac{7}{16}$ | $2\frac{1}{2}$ |
| | | | | $\frac{3}{4}$ | $1\frac{1}{4}$ | $\frac{1}{2}$ | $2\frac{5}{8}$ |

▲ Based on 8" hook rod length. Will vary for other hook rod lengths.

Fig. 228

Universal Forged Steel (UFS) Beam Clamp with UFS (Upper) Nut Right-Hand Thread

Material: Forged steel

Finish: Plain or Zinc Plated

Service: For suspension of heavy loads from beams with flange widths up to 15" and flange thickness to 1.031.

Approvals: Complies with Federal Specification A-A-1192A (Type 28 without links; Type 29 with links), WW-H-171-E (Type 30 & 31), ANSI/MSS SP-69 and MSS SP-58 (Type 28 without links; Type 29 with links).

Installation: Fit jaws over edges of lower beam flange and tighten nuts on tie rod to lock clamp in place.

Features:

- Upper nut is tapped to any specified size up to the maximum rod size.
- Quickly, easily, economically installed.
- Tie rod insures a tight non-slip fit to the beam.
- Clamps are available, tapped to any specified rod size up to the maximum rod size.

Ordering: Specify clamp size, figure number, name, rod size and finish.

Note: The application of a load to a structural beam by means of a beam clamp produces a transverse stress, perpendicular to the axis of the beam, in the flange to which the load is applied.

Size per load, beam flange width and rod size

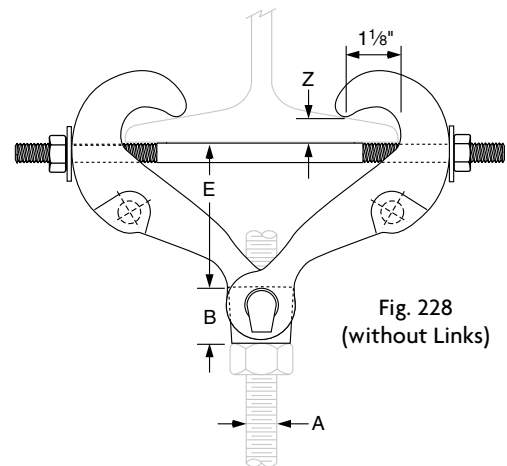
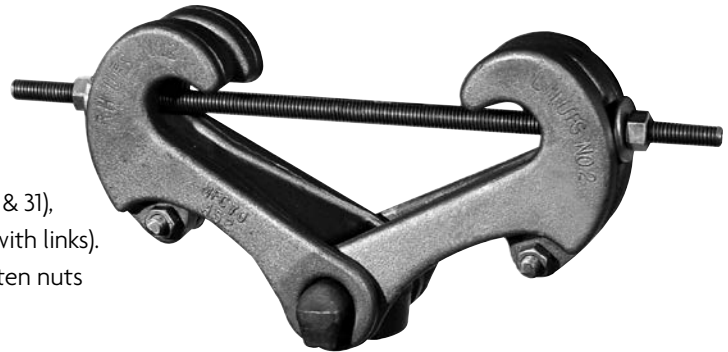


Fig. 228 (without Links)

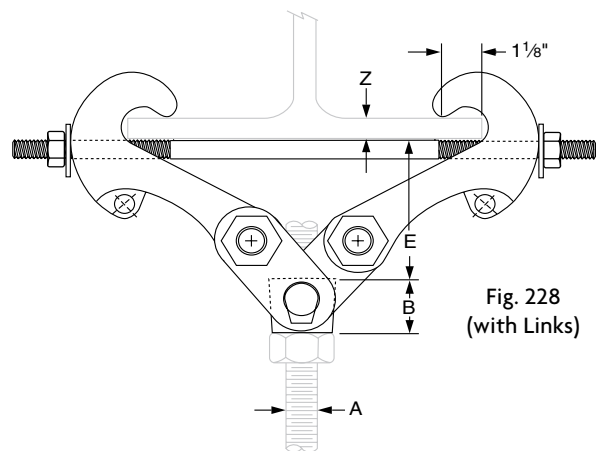


Fig. 228 (with Links)

| FIG. 228: DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS) | | | | | | |
|---|----------------|------------|--------|---------|--------|--------------------|
| Clamp Size No. | Max Rod Size A | Max Load ■ | Weight | Z Max ❖ | B | Jaw and Nut Size ▲ |
| 1 | 5/8 | 2,160 | 3.3 | 0.60 | 1 1/16 | 228 - 1 |
| 2 | 7/8 | 4,480 | 7.0 | | 1 3/8 | 228 - 2 |
| 3• | 1 1/2 | 11,500 | 19.3 | 1.031 | 2 3/8 | 228 - 3 |
| 4 | | | 31.0 | | | |
| 5• | | | | | | |

▲ For reference only, order by clamp size.

• Furnished with links.

■ Note: Load capacity based on rod sizes shown. For load capacity of other rod sizes see page 288.

❖ For actual "Z" dimensions see table on page 289.

| Clamp Size No. | Width of Beam Flange (in) | | | | | | | | | | | | | |
|----------------|---------------------------|--------|--------|--------|---------|---------|--------|--------|---------|--------|-------|---------|-------|---|
| | Rod Take Out - E (in) | | | | | | | | | | | | | |
| | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | |
| 1 | 1 9/16 | 1 1/2 | 1 5/16 | 1 1/8 | 3/4 | - | - | - | - | - | - | - | - | - |
| 2 | - | 1 7/16 | | | 1 1/16 | - | - | - | - | - | - | - | - | - |
| 3• | - | - | - | - | 1 15/16 | 1 13/16 | 1 1/2 | 1 5/16 | - | - | - | - | - | - |
| 4 | - | 2 5/16 | 2 3/16 | 2 1/16 | 1 13/16 | 1 7/8 | 1 9/16 | | - | - | - | - | - | - |
| 5• | - | - | - | - | - | - | - | 3 | 2 11/16 | 2 9/16 | 2 1/4 | 1 15/16 | 1 5/8 | |

• Furnished with links.

Fig. 292: Right-Hand Thread Universal Forged Steel (UFS) Beam Clamp with and without Weldless Eye Nut

Fig. 292L: Left-Hand Thread with and without Weldless Eye Nut

Material: Forged steel

Finish: Plain or Zinc Plated

Service: For suspension of heavy loads from beams with flange widths to 15" and flange thickness to 1.031.

Approvals: Complies with Federal Specification A-A-1192A (Type 28 without links; Type 29 with links), WW-H-171-E (Type 28 without links; Type 29 with links), ANSI/MSS SP-69 and MSS SP-58 (Type 28 without links; Type 29 with links).

Installation: Fit jaws over edges of lower beam flange and tighten nuts on tie rod to lock clamp in place.

Features:

- Weldless eye nut provides for horizontal pipe movement without binding.
- Weldless eye nut is furnished tapped to any specified rod size up to the maximum rod size.
- Tie rod assures a tight non-slip fit to the beam.
- Self locking nut with a nylon insert prevents the nut from working loose.

Ordering: Specify clamp size, figure number, name, rod size and finish.

Note: The application of a load to a structural beam by means of a beam clamp produces a transverse stress, perpendicular to the axis of the beam, in the flange to which the load is applied.

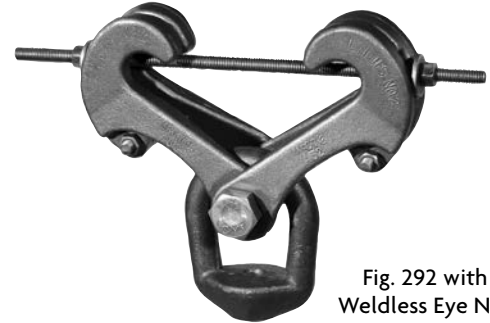


Fig. 292 with Weldless Eye Nut

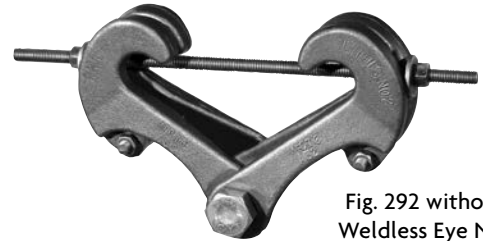


Fig. 292 without Weldless Eye Nut

**FIG. 292, FIG. 292L:
DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS)**

| Clamp Size No. | Max Rod Size A | Max Load ■ | Weight | Z Max ❖ | B | Jaw and Eye Nut Size ▲ |
|----------------|----------------|------------|--------|---------|--------|------------------------|
| 1 | 3/4 | 3,230 | 3.9 | 0.60 | 1 1/16 | 292 - 1 / 1 |
| 2 | 1 | | 9.2 | | 1 | 292 - 2 / 2 |
| 3 • | | | 13.0 | | | 292 - 3 / 2 |
| 4 | 1 1/2 | 11,500 | 21.7 | 1.031 | 1 1/4 | 292 - 3 / 3 |
| 5 • | | | 33.9 | | | |
| 6 | | | 23.9 | | | |
| 7 • | 2 | 11,500 | 35.8 | 2 1/4 | 2 1/4 | 292 - 3 / 4 |
| 8 | | | 36.8 | | | |

▲ For reference only, order by clamp size.

• Furnished with links.

■ Note: Load capacity based on rod sizes shown. For load capacity of other rod sizes see page 288.

❖ For actual "Z" dimensions see table on page 289.

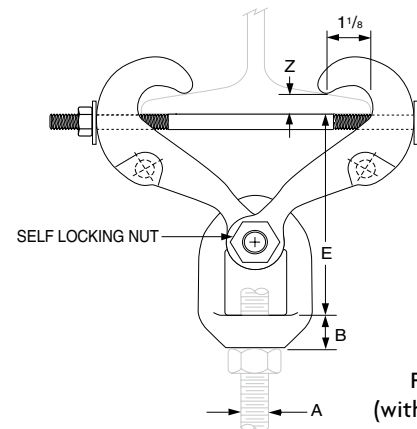


Fig. 292 (without Links)

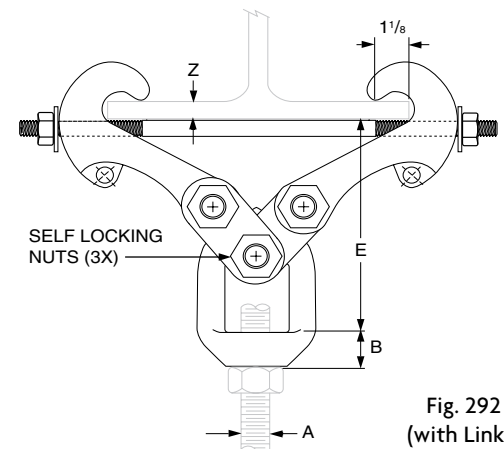


Fig. 292 (with Links)

| Clamp Size No. | Width of Beam Flange (in) | | | | | | | | | | | | |
|----------------|---------------------------|---------|--------|--------|---------|--------|---------|---------|-------|-------|-------|-------|--------|
| | Rod Take Out - E (in) | | | | | | | | | | | | |
| | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 1 | 4 1/2 | 4 5/16 | 4 1/16 | 3 5/8 | 2 7/8 | - | - | - | - | - | - | - | - |
| 2 | - | 4 3/4 | 4 7/16 | 4 1/16 | 3 3/8 | - | - | - | - | - | - | - | - |
| 3 • | - | - | - | - | 5 15/16 | 6 | 5 5/16 | 5 | - | - | - | - | - |
| 4 | - | 6 13/16 | 6 5/8 | 6 3/8 | 5 7/8 | 5 3/8 | 5 3/8 | 4 13/16 | - | - | - | - | - |
| 5 • | - | - | - | - | - | - | - | - | 8 1/8 | 7 3/4 | 7 1/8 | 6 5/8 | 6 1/16 |
| 6 | - | 7 3/16 | 7 | 6 3/4 | 6 1/4 | 6 5/16 | 5 13/16 | 5 3/16 | - | - | - | - | - |
| 7 • | - | - | - | - | - | - | - | - | 8 1/2 | 8 1/8 | 7 1/2 | 7 | 6 1/16 |
| 8 | - | 8 5/8 | 8 7/16 | 8 3/16 | 7 3/4 | 7 3/4 | 7 1/4 | 6 5/8 | - | - | - | - | - |

Fig. 127

Plastic Ceiling Plate

Size Range: $\frac{3}{8}$ " and $\frac{1}{2}$ "

Material: Plastic

Service: Recommended for giving a finished appearance where rod enters ceiling.

Installation: Slide plate up rod until flush against ceiling.

Features:

- Highly economical
- Quickly installed
- Held firmly to rod by design and friction

Ordering: Specify rod size, figure number, name. (rod not included)



FIG. 127: DIMENSIONS (IN) • WEIGHT (LBS)

| Rod Size A | Weight | Outside Dia. | Depth |
|---------------|--------|------------------|---------------|
| $\frac{3}{8}$ | 0.07 | $1\frac{13}{16}$ | $\frac{1}{2}$ |
| $\frac{1}{2}$ | | | |

Fig. 128R

Rod Threaded, Ceiling Flange

Size Range: $\frac{3}{8}$ " and $\frac{1}{2}$ "

Material: Malleable iron

Finish: Plain or Zinc Plated (Hot-Dip Galvanized optional)

Service: Recommended for attachment to wood beams or ceiling.

Ordering: Specify rod size, figure number, name and finish.

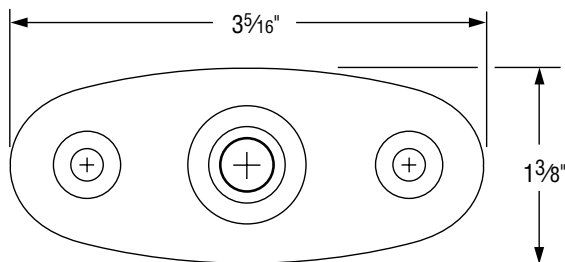
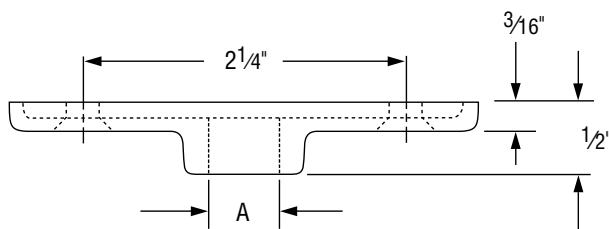


FIG. 128R: DIMENSIONS (IN) • LOAD (LBS) • WEIGHT (LBS)

| Rod Size A | Max Load | Weight | Screws (not included) | |
|---------------|----------|--------|-----------------------|----------|
| | | | Quantity | Size No. |
| $\frac{3}{8}$ | 180 | 0.16 | 2 | 12 |
| $\frac{1}{2}$ | | | | |

Fig. CT-128R

Rod Threaded Ceiling Flange

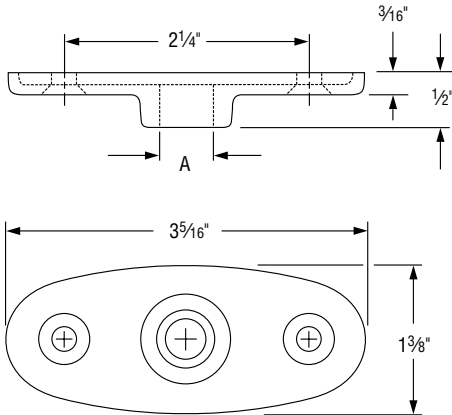
Size Range: $\frac{3}{8}$ " and $\frac{1}{2}$ "

Material: Malleable iron

Finish: Copper plated

Service: Recommended for attachment to wood beams or ceiling.

Ordering: Specify rod size, figure number, name.



**FIG. CT-128R:
DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS)**

| Rod Size A | Max Load | Weight | Screws | |
|---------------|----------|--------|----------|----------|
| | | | Quantity | Size No. |
| $\frac{3}{8}$ | 180 | 0.16 | 2 | 12 |
| $\frac{1}{2}$ | | | | |

Fig. 395

Cast Iron Ceiling Plate

Size Range: $\frac{1}{2}$ " through 8"

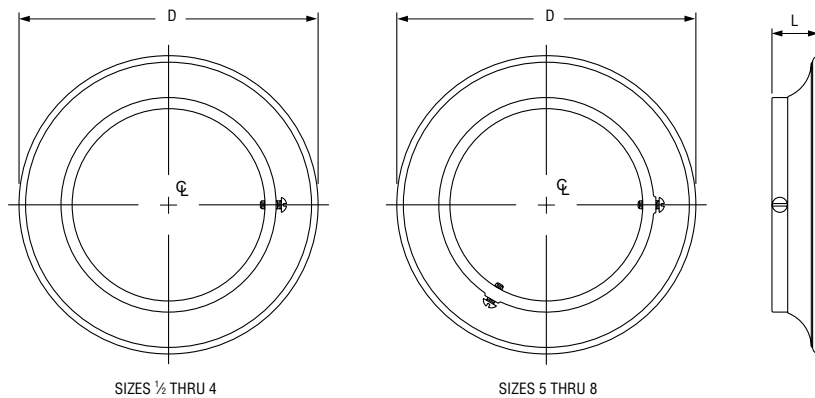
Material: Cast iron

Finish: Plain or Zinc Plated

Service: Gives finished appearance where pipe enters ceiling.

Installation: Sizes $\frac{1}{2}$ " to 4" furnished with one machine screw; sizes 5" to 8", two machine screws.

Ordering: Specify pipe size, figure number, name and finish.



**FIG. 395:
DIMENSIONS (IN) • WEIGHT (LBS)**

| Pipe Size | Weight | D - Dia. | L |
|----------------|--------|------------------|----------------|
| $\frac{1}{2}$ | 0.21 | $2\frac{7}{8}$ | $\frac{3}{4}$ |
| $\frac{3}{4}$ | 0.40 | $3\frac{3}{8}$ | 1 |
| 1 | 0.41 | $3\frac{5}{8}$ | |
| $1\frac{1}{4}$ | 0.51 | 4 | |
| $1\frac{1}{2}$ | 0.55 | $4\frac{1}{4}$ | |
| 2 | 0.67 | $4\frac{3}{4}$ | |
| $2\frac{1}{2}$ | 0.93 | $5\frac{1}{2}$ | $1\frac{1}{8}$ |
| 3 | 1.10 | $6\frac{1}{8}$ | |
| 4 | 1.40 | $7\frac{1}{8}$ | |
| 5 | 2.50 | $8\frac{11}{16}$ | $1\frac{1}{4}$ |
| 6 | 3.10 | $9\frac{1}{4}$ | |
| 8 | 3.30 | $11\frac{3}{4}$ | |

Fig. 153

Pipe Hanger Flange

Size Range: $\frac{3}{8}$ " through $\frac{3}{4}$ "

Material: Malleable iron

Finish: Plain

Service: Recommended for suspension of pipe lines or conduit from level ceilings.

Approvals: UL, ULC Listed and FM Approved (Sizes $\frac{3}{8}$ " and $\frac{1}{2}$ ").

Installation: Flange size $\frac{3}{8}$ " has two holes, sizes $\frac{1}{2}$ ", $\frac{5}{8}$ ", and $\frac{3}{4}$ " have three holes.

Features:

- Provides vertical adjustment up to 1".
- Good appearance.

Ordering: Specify rod size, figure number and name.

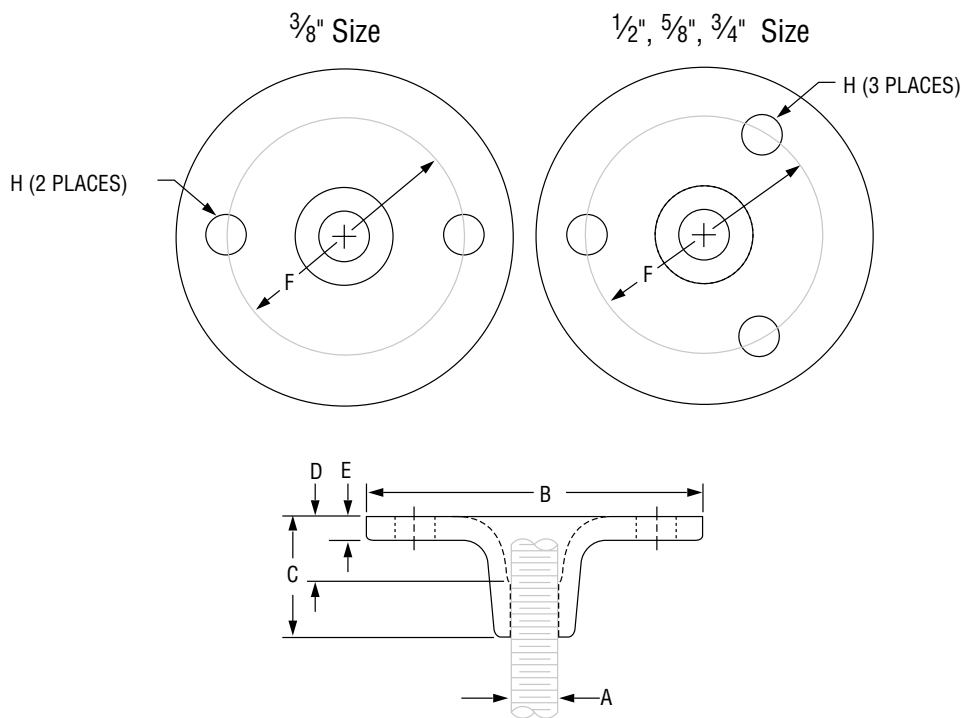


FIG. 153: DIMENSIONS (IN) • LOAD (LBS) • WEIGHT (LBS)

| Rod Size A | Max Load | Weight | Size Screw "H" (not included) | B | C | D | E | Screw Circle Dia. - F |
|---------------|----------|--------|----------------------------------|----------------|----------------|-----------------|----------------|--------------------------|
| $\frac{3}{8}$ | 425 | 0.4 | #18 x $1\frac{1}{2}$ | $2\frac{7}{8}$ | $1\frac{3}{8}$ | $\frac{7}{8}$ | $\frac{3}{16}$ | 2 |
| $\frac{1}{2}$ | 1,050 | 0.9 | $\frac{3}{8}$ x 2 | 4 | $1\frac{1}{2}$ | $\frac{15}{16}$ | $\frac{1}{4}$ | $2\frac{7}{8}$ |
| $\frac{5}{8}$ | 1,220 | 1.5 | $\frac{1}{2}$ x 2 | $4\frac{3}{4}$ | $1\frac{5}{8}$ | 1 | $\frac{5}{16}$ | $3\frac{3}{8}$ |
| $\frac{3}{4}$ | 1,270 | 2.2 | $\frac{9}{16}$ x 2 | $5\frac{1}{4}$ | $1\frac{7}{8}$ | $1\frac{1}{16}$ | $\frac{3}{8}$ | $3\frac{5}{8}$ |

Fig. 610 (Formerly Afcon Fig. 610)

Ceiling Plate

Size Range: 3/8" rod

Material: Carbon Steel

Finish: Electro-Galvanized per ASTM B633

Service: Ceiling plate mounts on the underside of wood and steel to support up to 4" NPS horizontal piping.

Approvals: cULus Listed (UL 203)

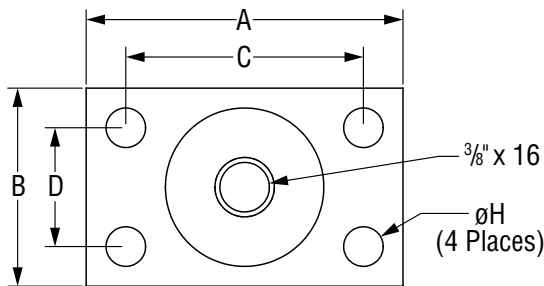
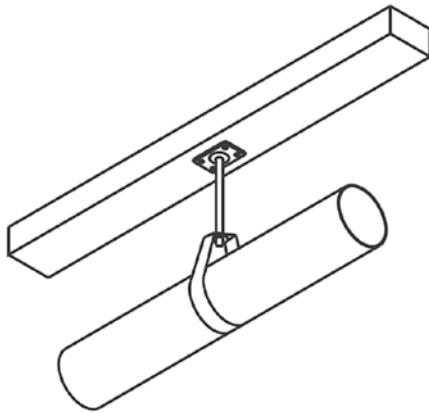
Installation:

- Mount on the underside of wood or steel using the fasteners listed in NFPA 13 and the mounting fastener table listed below.
- Fully thread the rod through the threaded mounting hole.

Features:

- Fastener array optimizes the fastener size and placement for various structure types and pipe sizes.

Ordering: Specify figure number, finish, and description.



| cULus LISTED MOUNTING FASTENERS POSITIONS | |
|--|--------------------|
| QTY of 2 Fasteners | QTY of 4 Fasteners |
| <p>OR</p> | |

| cULus LISTED MOUNTING FASTENERS FOR STEEL PIPE | | | |
|---|---|-----|-----------|
| Structure | Fastener Options | QTY | Pipe Size |
| Wood | 1/4" x 1 1/2" Lag Screw #14 x 1 1/2" TEK Screw | 2 | ≤ 3" |
| Wood | 1/4" x 1 1/2" Lag Screw #14 x 1 1/2" TEK Screw | 4 | ≤ 4" |
| Steel (14ga Min) | 1/4" x 1" TEK Screw #14 x 1" TEK Screw | 2 | ≤ 4" |
| Steel (16ga Min) | 1/4" x 1" TEK Screw #14 x 1" TEK Screw | 2 | ≤ 2" |
| Steel (16ga Min) | 1/4" x 1" TEK Screw #14 x 1" TEK Screw | 4 | ≤ 4" |
| Steel (18ga Min) | #10 x 1" TEK Screw | 4 | ≤ 2 1/2" |
| Steel (20ga Min) | #10 x 1" TEK Screw | 4 | ≤ 2 1/2" |
| Steel (22ga Min) | #10 x 1" TEK Screw | 4 | ≤ 2" |

| FIG. 610: DIMENSION (IN) • WEIGHT (LBS) | | | | | | |
|---|---|-------|-------|-----|-----|--------------------|
| Rod Size | A | B | C | D | øH | Approx. Weight/100 |
| 3/8" | 2 | 1 1/4 | 1 1/2 | 3/4 | 1/4 | 20 |

Note: Sheet Metal Screws are acceptable alternatives for TEK Screws. If installing through gypsum board or sheetrock into wood, the fastener length must be increased. A minimum of 1 3/8" screw embedment in the wood is required.

WALL BRACKETS

Fig. 194 (Formerly Afcon Fig. 770)

Light Welded Steel Bracket

Material: Carbon steel

Finish: Plain or Hot-Dip Galvanized

Service: Recommended for support from below or above bracket.

Approvals: Complies with Federal Specification A-A-1192A (Type 31), WW-H-171-E (Type 32), ANSI/MSS SP-69 and MSS SP-58 (Type 31). FM Approved when used with $\frac{3}{8}$ " rod, $\frac{3}{4}$ " - 4" pipe sizes & $\frac{1}{2}$ " rod, 5" - 8" pipe sizes.

How to size: Determine bracket size by dimension of standard bracket most suitable to the installation.

Installation: When bolted to a wall, an additional back plate may be required of such thickness and size as to properly distribute the weight over the wall. Size and thickness of the back plate is governed by the load to be carried and the nature and conditions of the wall. Back plates furnished upon request.

Features:

- Bracket may be installed either in position illustrated or reversed.
- Ends of bracket are drilled to accept hanger rods up to $\frac{3}{4}$ ".

Ordering: Specify bracket number, figure number, name and finish.

Order separately: Hanger rods, 2 bolts and plate washers are available through our Regional Service Centers, order as a Figure 193.

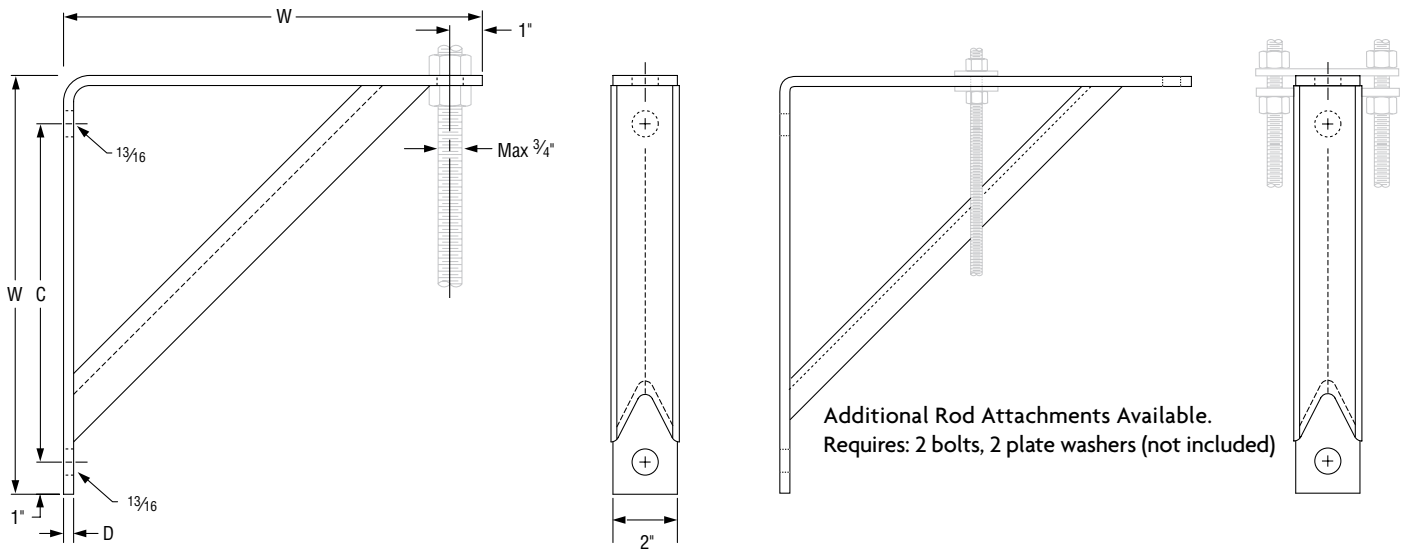
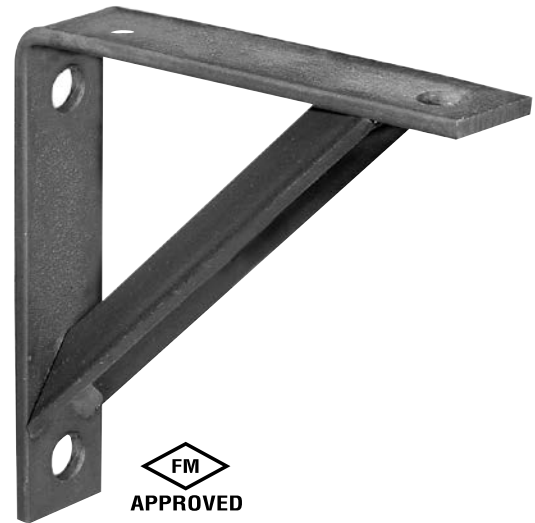


FIG. 194: DIMENSIONS (IN) • LOAD (LBS) • WEIGHT (LBS)

| Bracket no. | Max Load | Weight | W | C | D |
|-------------|----------|--------|----|-----|------|
| 1 | 750 | 3.1 | 9 | 6½ | 5/16 |
| 2 | | 7.7 | 13 | 10½ | |
| 3 | | 12.8 | 19 | 16½ | 3/8 |

Fig. 195

Medium Welded Steel Bracket

Material: Carbon steel

Finish: Plain or Hot-Dip Galvanized

Service: Recommended for the support of loads from below or above bracket.

Approvals: Complies with Federal Specification A-A-1192A (Type 32), WW-H-171-E (Type 33), ANSI/MSS SP-69 and MSS SP-58 (Type 32).

How to size: Determine size by dimensions most suitable to the installation (see dimensions of standard brackets below). Special welded steel brackets can be furnished on order.

Installation: When bolted to a wall, an additional back plate may be required of such thickness and size as to properly distribute the weight over the wall. Size and thickness of the back plate is governed by the load to be carried and the nature and conditions of the wall. Back plates furnished upon request.

Features: If supporting pipe by rod, rod can be installed anywhere along the length of the bracket thus providing horizontal adjustment.

Ordering: Specify bracket number, figure number, name and finish. Orders for special brackets are to be accompanied by detailed sketch.

Order Separately: Rod, Fig. 60, bolts, nuts, and back plates for fastening brackets to wall. Specify size and length of rod, bolts size, thickness, and drilling of back plates.

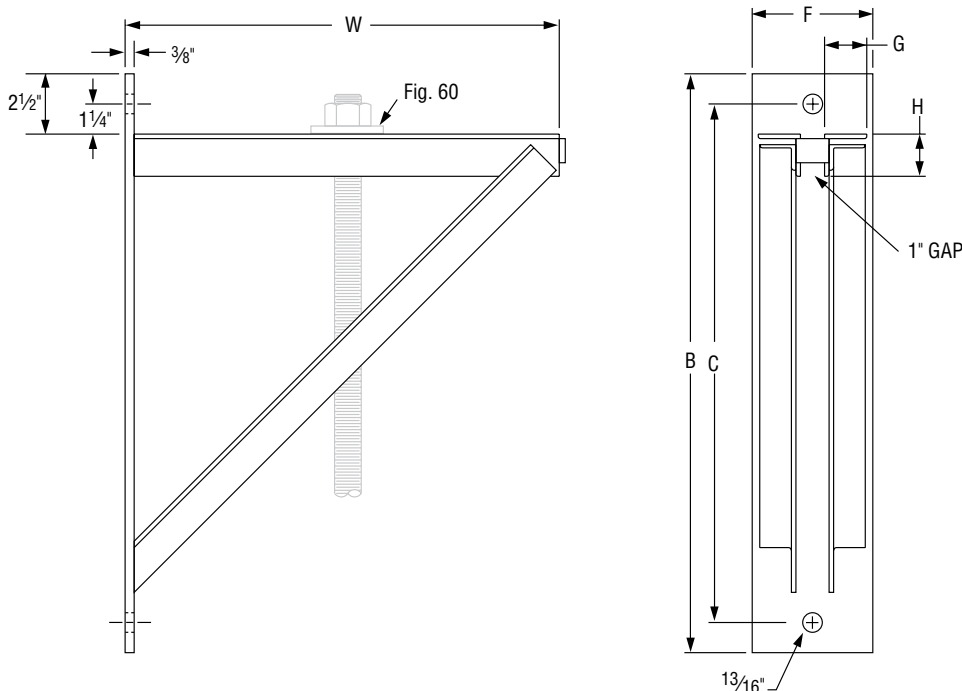


FIG. 195: DIMENSIONS (IN) • LOAD (LBS) • WEIGHT (LBS)

| Bracket no. | Max Load | Weight | W | B | C | F | G | H |
|-------------|----------|--------|----|----|-----|---|----|----|
| 0 | 1,500 | 17.4 | 12 | 18 | 15½ | 4 | 1½ | 1½ |
| 1 | | 27.3 | 18 | 24 | 21½ | 5 | 1¾ | 1¾ |
| 2 | | 47.7 | 24 | 30 | 27½ | | 2 | 2 |

WALL BRACKETS

Fig. 199

Heavy Welded Steel Bracket

Material: Carbon steel

Finish: Plain or Hot-Dip Galvanized

Service: Recommended for the support of loads from above or below bracket.

Approvals: Complies with Federal Specification A-A-1192A (Type 33)

WW-H-171-E (Type 34), ANSI/MSS SP-69 and MSS SP-58 (Type 33).

How to size: Determine size by dimensions most suitable to the installation (see dimensions of standard brackets below). Special welded steel brackets can be furnished on order.

Installation: When bolted to a wall, an additional back plate may be required of such thickness and size as to properly distribute the weight over the wall. Size and thickness of the back plate is governed by the load to be carried and the nature and conditions of the wall. Back plates furnished upon request.

Features: If supporting pipe by rod, rod can be installed at any point along the length of the bracket thus providing horizontal adjustment.

Ordering: Specify bracket number, figure number, name. Orders for special brackets are to be accompanied by detailed sketch.

Order Separately: Rod, Fig. 60, bolts, nuts, and back plates for fastening brackets to wall. Specify size and length of rod, bolts size, thickness, and drilling of back plates.

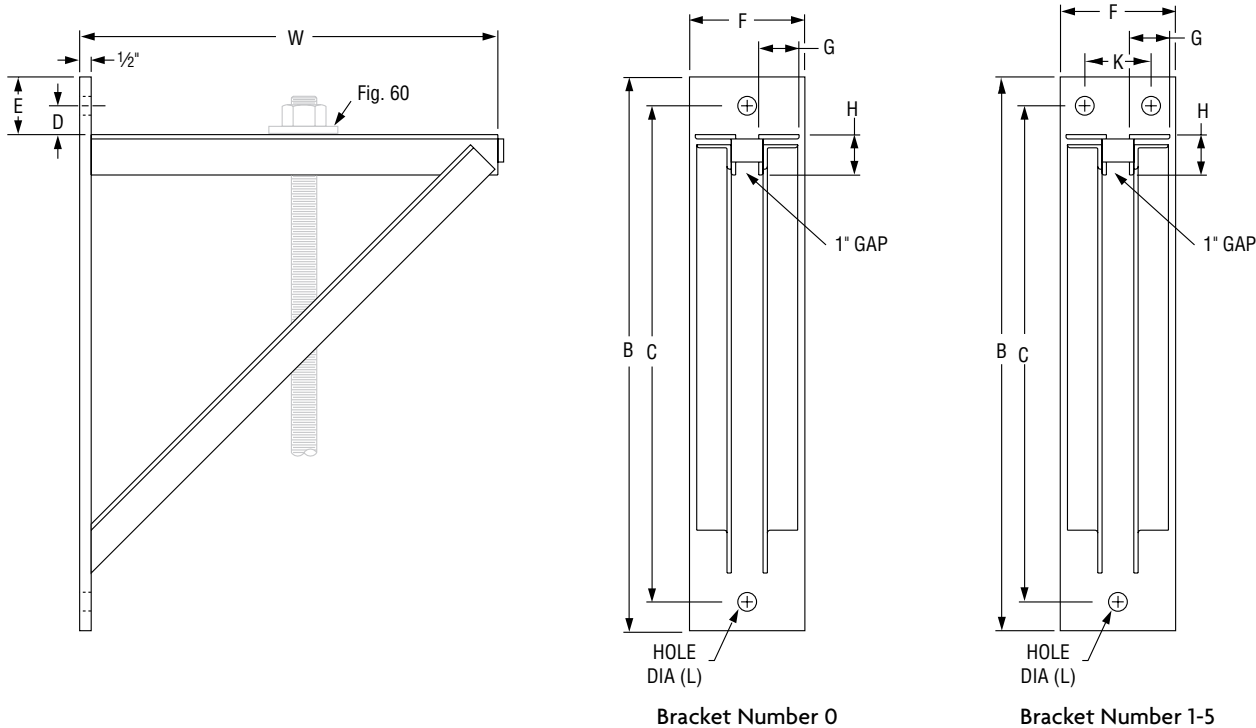
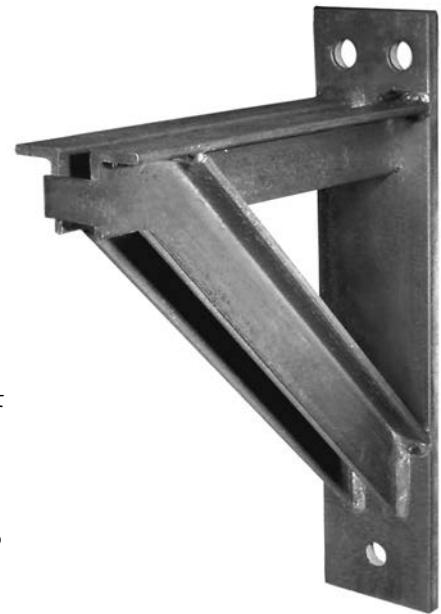


FIG. 199: DIMENSIONS (IN) • LOAD (LBS) • WEIGHT (LBS)

| Bracket no. | Max Load | Weight | W | B | C | D | E | F | G | H | K | L |
|-------------|----------|--------|----|----|--------------------------------|--------------------------------|-------------------------------|---|-------------------------------|-------------------------------|--------------------------------|--------------------------------|
| 0 | 3,000 | 24.3 | 12 | 18 | 15 ³ / ₄ | 1 ³ / ₈ | 2 ³ / ₄ | 4 | 1 ¹ / ₄ | 2 | — | 1 ³ / ₁₆ |
| 1 | | 51.8 | 18 | 24 | 21 ³ / ₈ | 1 ⁷ / ₁₆ | | 5 | 2 | | 2 ³ / ₄ | 1 ⁵ / ₁₆ |
| 2 | | 68.9 | 24 | 30 | 27 ¹ / ₂ | 1 ¹ / ₂ | 3 | 6 | 2 ¹ / ₂ | 2 ¹ / ₂ | 1 ¹ / ₁₆ | |
| 3 | | 86.1 | 30 | 36 | 33 ³ / ₄ | 1 ⁵ / ₈ | | | | | | |
| 4 | | 140.5 | 36 | 42 | 39 | 1 ¹ / ₂ | | | | | | |
| 5 | | 166.4 | 42 | 50 | 46 | | 3 ¹ / ₂ | | | | | |

Fig. 202

Iron Side Beam Bracket

Size Range: $\frac{3}{8}$ " through $\frac{5}{8}$ "

Material: Malleable iron

Finish: Plain

Service: Recommended for attachment to steel or wooden beams, etc.

Approvals: Complies with Federal Specification A-A-1192A (Type 34) WW-H-171-E (Type 35), ANSI/MSS SP-69 and MSS SP-58 (Type 34).

UL, ULC Listed and FM Approved (Sizes $\frac{3}{8}$ " for use on wooden and steel beams and $\frac{1}{2}$ " for use on steel beams).

Features: An economical, practical and adjustable means of securing hangers to beams, etc.

Ordering: Specify rod size, figure number, name and finish.

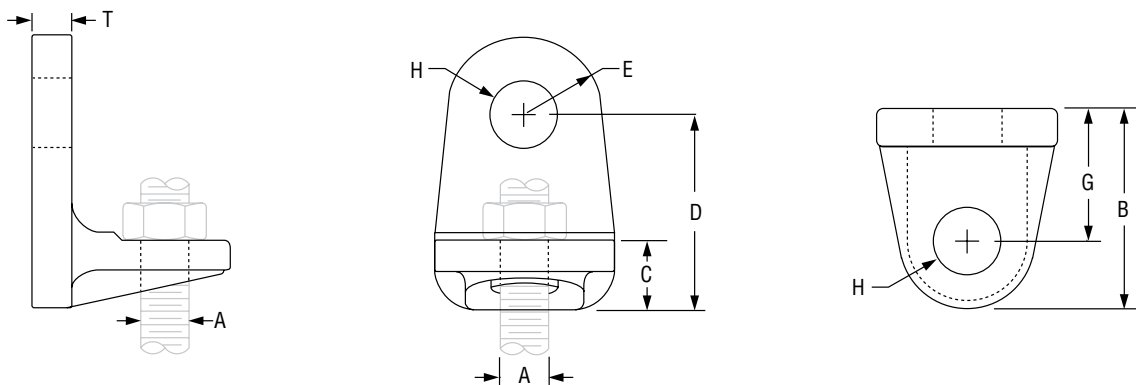


FIG. 202: DIMENSIONS (IN) • LOAD (LBS) • WEIGHT (LBS)

| Rod Size A | Max Load ■ | | Weight | B | C | D | E | Hole Dia. H | G | T |
|---------------|-------------------|-----------------------|--------|------------------|---------------|-----------------|-----------------|----------------|-----------------|------------------|
| | With Lag Screw | With Bolt to Steel | | | | | | | | |
| $\frac{3}{8}$ | 390 | 730 | 0.26 | $1\frac{1}{8}$ | $\frac{5}{8}$ | $1\frac{7}{16}$ | $\frac{17}{32}$ | $\frac{7}{16}$ | $\frac{7}{8}$ | $\frac{1}{4}$ |
| $\frac{1}{2}$ | 640 | 1,350 | 0.54 | $1\frac{13}{16}$ | $\frac{3}{4}$ | $1\frac{7}{8}$ | $2\frac{1}{32}$ | $\frac{9}{16}$ | $1\frac{3}{16}$ | $1\frac{11}{32}$ |
| $\frac{5}{8}$ | 760 | 2,160 | 0.94 | $2\frac{3}{16}$ | $\frac{7}{8}$ | $2\frac{1}{8}$ | $\frac{7}{8}$ | $\frac{3}{4}$ | $1\frac{7}{16}$ | $\frac{7}{16}$ |

■ Maximum temperature of 450° F.

WALL BRACKETS

Fig. 206 (Formerly Afcon Fig. 556/560/565)

Steel Side Beam Bracket

Size Range: $\frac{3}{8}$ " through $\frac{5}{8}$ "

Material: Carbon steel

Finish: Plain or Zinc Plated (Hot-Dip Galvanized optional)

Service: Clip can be fastened to side of joist or wall to support hanger rod.

Approvals: Complies with Federal Specification A-A-1192A (Type 34), WW-H-171-E (Type 35) and ANSI/MSS SP-69 and MSS SP-58 (Type 34). UL Listed and FM Approved (steel beam only).

Ordering: Specify rod size, figure number, name and finish.

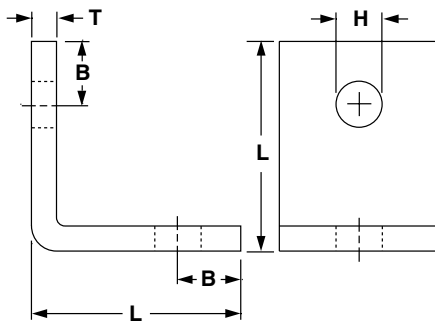
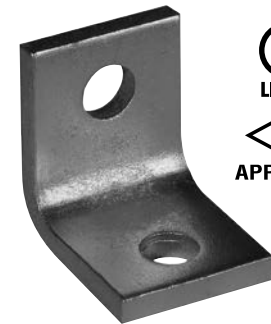


FIG. 206: DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS)

| Rod Size A | Max Load | | Weight (lbs). | L | B | Hole Size H | T |
|---------------|----------------|--------------------|---------------|-----------------|---------------|-----------------|---------------|
| | With Lag Screw | With Bolt to Steel | | | | | |
| $\frac{3}{8}$ | 650 | 1,150 | 0.44 | $2\frac{1}{16}$ | $\frac{5}{8}$ | $\frac{7}{16}$ | $\frac{1}{4}$ |
| $\frac{1}{2}$ | | | 0.43 | | | $\frac{9}{16}$ | |
| $\frac{5}{8}$ | 850 | 2,000 | 0.84 | $2\frac{1}{2}$ | $\frac{3}{4}$ | $\frac{11}{16}$ | $\frac{3}{8}$ |

Fig. 207 (Formerly Afcon Fig. 553/555)

Threaded Steel Side Beam Bracket

Size Range: $\frac{3}{8}$ " and $\frac{1}{2}$ "

Material: Carbon steel

Finish: Plain or Zinc Plated

Service: Recommended for attachment to steel or wooden beams, etc.

Approvals: Complies with Federal Specification A-A-1192A (Type 34), WW-H-171-E (Type 35), ANSI/MSS SP-69 and MSS SP-58 (Type 34). UL Listed (Sizes $\frac{3}{8}$ " and $\frac{1}{2}$ ").

FM Approved (Size $\frac{3}{8}$ " for use on steel beam only)

Features: Threaded mounting bracket provides an economical, practical, and adjustable means of securing hangers to beams.

Ordering: Specify rod size, figure number, name and finish.

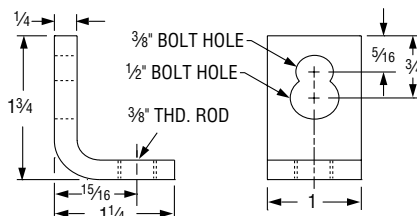


Fig. 207 $\frac{3}{8}$ "

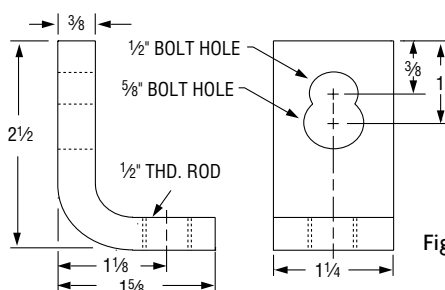


Fig. 207 $\frac{1}{2}$ "

FIG. 207: DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS)

| Rod Size A | Bolt Size | Max Load | | Weight |
|---------------|---------------|----------------|--------------------|--------|
| | | With Lag Screw | With Bolt to Steel | |
| $\frac{3}{8}$ | $\frac{3}{8}$ | 400 | 620 | 0.17 |
| | $\frac{1}{2}$ | 560 | | |
| $\frac{1}{2}$ | $\frac{1}{2}$ | 650 | 1,150 | 0.42 |
| | $\frac{5}{8}$ | 850 | | |

Fig. 550 (Formerly Afcon Fig. 550)

Revolver Swivel

Size Range: $\frac{3}{8}$ " rod

Material: Carbon Steel

Finish: Pre-Galvanized per ASTM A653

Service: Wall Bracket mounts on the side and underside of wood, steel, and concrete walls and beams to support up to 4" NPS horizontal piping.

Approvals: cULus Listed (UL 203)

Patents: No. 6,568,642

Installation:

- Mount on the side or underside of wood, steel, or concrete walls and beams using the fasteners listed in NFPA 13 and the mounting fastener table listed below.
- Thread the hanger rod or restraint rod into the hex union until it bottoms. Back rod off a maximum of one turn to allow the hex union to swivel freely. Adjust angle as necessary.
- If the Fig. 550 is exposed to vibration from the piping system or the structure, jam nuts may be installed on the mounting bolt and the threaded rod.
- Fire Protection applications shall also be installed per NFPA 13 requirements.

Features:

- Universal fastener array optimizes the fastener size and placement for various structure types and pipe sizes.
- No backing nuts are required on the rod.
- Center mounting hole accepts $\frac{3}{8}$ " and $\frac{1}{2}$ " fasteners

Ordering: Specify figure number and description.

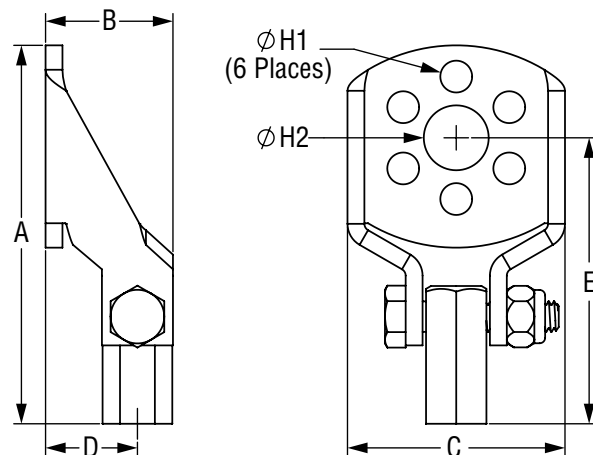


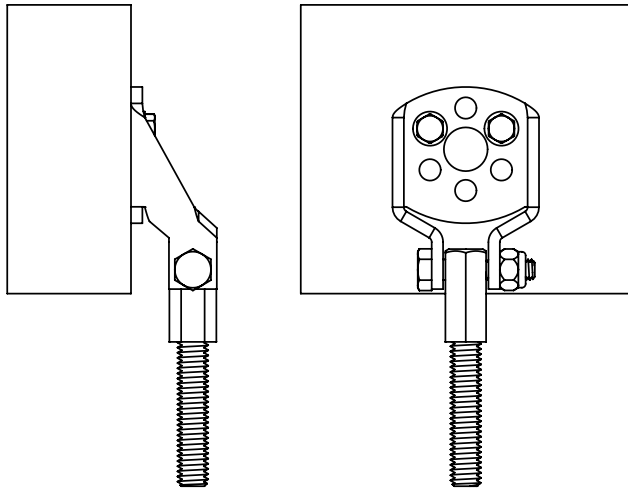
FIG. 550: DIMENSIONS (IN) • WEIGHT (LBS)

| Rod Size | A | B | C | D | E | $\phi H1$ | $\phi H2$ | Approx. Weight/100 |
|---------------|---|---|-----------------|---------------|-----------------|---------------|---------------|--------------------|
| $\frac{3}{8}$ | 3 | 1 | 1 $\frac{3}{4}$ | $\frac{3}{4}$ | 2 $\frac{3}{8}$ | $\frac{1}{4}$ | $\frac{1}{2}$ | 20 |

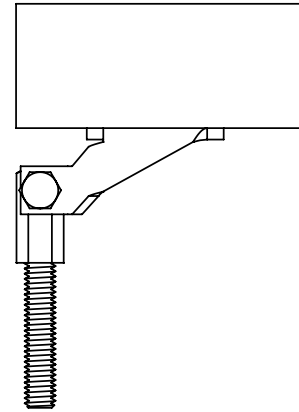
WALL BRACKETS

Fig. 550 (Formerly Afcon Fig. 550)

Revolver Swivel (cont.)



Horizontal Installation



Vertical Installation

cULus LISTED MOUNTING FASTENERS FOR STEEL PIPE

| HORIZONTAL INSTALLATION | | | | | VERTICAL AND ANGLED INSTALLATION | | | | |
|-------------------------|--|-----|-----------|-------------------|--|--|-----|-----------|-------------------|
| Structure | Fastener | QTY | Pipe Size | Fastener Position | Structure | Fastener | QTY | Pipe Size | Fastener Position |
| Wood | ¼ x 1½" Lag Screw #14 x 1½" TEK Screw | 1 | ≤ 2" | | Wood | ¼ x 2" Lag Screw #14 x 2" TEK Screw | 2 | ≤ 4" | |
| Wood | ¼ x 1½" Lag Screw #14 x 1½" TEK Screw | 2 | ≤ 4" | | Steel (¼" Min) | ¼ or #14 TEK Screw | 1 | ≤ 2" | |
| Wood ¹ | ¾ x 2½" Lag Screw | 1 | ≤ 2" | | Steel (¼" Min) | ¼ or #14 TEK Screw | 2 | ≤ 4" | |
| Wood ¹ | ½ x 3" Lag Screw | 1 | ≤ 4" | | Note 1: Per NFPA 13-2016 Table 9.1.5.3.1 and NFPA 13-2013 Table 9.1.5.3.1 Note 2: Sheet Metal Screws are acceptable alternatives for TEK Screws | | | | |
| Steel (14ga Min) | #14 x 1" TEK Screw | 1 | ≤ 3" | | | | | | |
| Steel (14ga Min) | #14 x 1" TEK Screw | 2 | ≤ 4" | | | | | | |
| Steel (16ga Min) | #14 x 1" TEK Screw | 1 | ≤ 2½" | | | | | | |
| Steel (16ga Min) | #14 x 1" TEK Screw | 2 | ≤ 4" | | | | | | |
| Steel (18ga Min) | #14 x 1" TEK Screw | 1 | ≤ 2½" | | | | | | |
| Steel (18ga Min) | #14 x 1" TEK Screw | 2 | ≤ 3" | | | | | | |
| Steel (18ga Min) | #14 x 1" TEK Screw | 3 | ≤ 4" | | | | | | |

Fig. 551 (Formerly Afcon Fig. 551)

Revolver Bracket

Size Range: $\frac{3}{8}$ " rod

Material: Carbon Steel

Finish: Pre-Galvanized per ASTM A653

Service: Wall Bracket mounts on the side of wood, steel, and concrete walls and beams to support up to 4" NPS horizontal piping.

Approvals: cULus Listed (UL 203)

Patents: No. 6,568,642

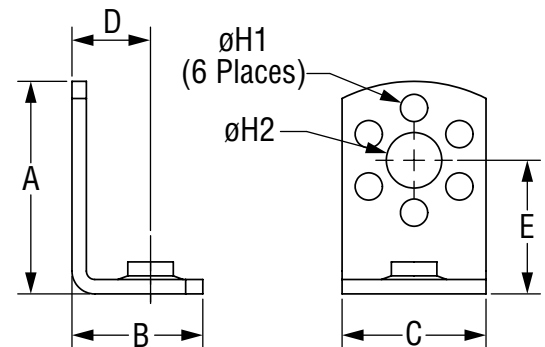
Installation:

- Mount on the side of wood, steel, or concrete walls and beams using the fasteners listed in NFPA 13 and the mounting fastener table listed below.
- Fully thread the rod through the threaded mounting hole.

Features:

- Universal fastener array optimizes the fastener size and placement for various structure types and pipe sizes.
- Threaded mounting hole features a lead-in radius for easier installation.
- No backing nuts are required on the rod.
- Center mounting hole accepts $\frac{3}{8}$ " and $\frac{1}{2}$ " fasteners

Ordering: Specify figure number and description.



| FIG. 551: DIMENSIONS (IN) • WEIGHT (LBS) | | | | | | | | |
|--|---|-----------------|-----------------|---------------|-----------------|---------------|---------------|--------------------|
| Rod Size | A | B | C | D | E | $\phi H1$ | $\phi H2$ | Approx. Weight/100 |
| $\frac{3}{8}$ | 2 | 1 $\frac{1}{4}$ | 1 $\frac{3}{8}$ | $\frac{3}{4}$ | 1 $\frac{1}{4}$ | $\frac{1}{4}$ | $\frac{1}{2}$ | 12 |

Fig. 551 (Formerly Afcon Fig. 551)

Revolver Bracket (cont.)

| cULus LISTED MOUNTING FASTENERS FOR STEEL PIPE | | | | | | | | | |
|--|--|-----|-----------|-------------------|--|--------------------|-----|-----------|-------------------|
| Structure | Fastener | QTY | Pipe Size | Fastener Position | Structure | Fastener | QTY | Pipe Size | Fastener Position |
| Wood | ¼ x 1½" Lag Screw #14 x 1½" TEK Screw | 1 | ≤ 2" | | Steel (18ga Min) | #14 x 1" TEK Screw | 3 | ≤ 4" | |
| Wood | ¼ x 1½" Lag Screw #14 x 1½" TEK Screw | 2 | ≤ 4" | | Steel (20ga Min) | #14 x 1" TEK Screw | 1 | ≤ 2" | |
| Wood | #16 x 2" Drive Screw | 2 | ≤ 2" | | Steel (20ga Min) | #14 x 1" TEK Screw | 2 | ≤ 3" | |
| Wood | #16 x 2" Drive Screw | 3 | ≤ 4" | | Steel (20ga Min) | #14 x 1" TEK Screw | 3 | ≤ 4" | |
| Wood¹ | ¾ x 2½" Lag Screw | 1 | ≤ 2" | | Steel (22ga Min) | #14 x 1" TEK Screw | 3 | ≤ 2½" | |
| Wood¹ | ½ x 3" Lag Screw | 1 | ≤ 4" | | Steel (18ga Min) | #10 x 1" TEK Screw | 1 | ≤ 2½" | |
| Steel (14ga Min) | #14 x 1" TEK Screw | 1 | ≤ 3" | | Steel (18ga Min) | #10 x 1" TEK Screw | 2 | ≤ 3" | |
| Steel (14ga Min) | #14 x 1" TEK Screw | 2 | ≤ 4" | | Steel (18ga Min) | #10 x 1" TEK Screw | 3 | ≤ 4" | |
| Steel (16ga Min) | #14 x 1" TEK Screw | 1 | ≤ 2½" | | Steel (20ga Min) | #10 x 1" TEK Screw | 2 | ≤ 3" | |
| Steel (16ga Min) | #14 x 1" TEK Screw | 2 | ≤ 4" | | Steel (20ga Min) | #10 x 1" TEK Screw | 4 | ≤ 4" | |
| Steel (18ga Min) | #14 x 1" TEK Screw | 1 | ≤ 2½" | | Steel (22ga Min) | #10 x 1" TEK Screw | 3 | ≤ 3" | |
| Steel (18ga Min) | #14 x 1" TEK Screw | 2 | ≤ 3" | | Note 1: Per NFPA 13-2016 Table 9.1.5.3.1 and NFPA 13-2013 Table 9.1.5.3.1 Note 2: Sheet Metal Screws are acceptable alternatives for TEK Screws | | | | |

Fig. 54

Two Hole Welding Beam Lug

Size Range: 1/2" through 2 1/4"

Material: Carbon steel

Finish: Plain or Hot-Dip Galvanized

Service: For single rod suspension of Fig. 81-H, type B and C constant supports.

Ordering: Specify rod size, figure number, name, finish and "H" dimension.

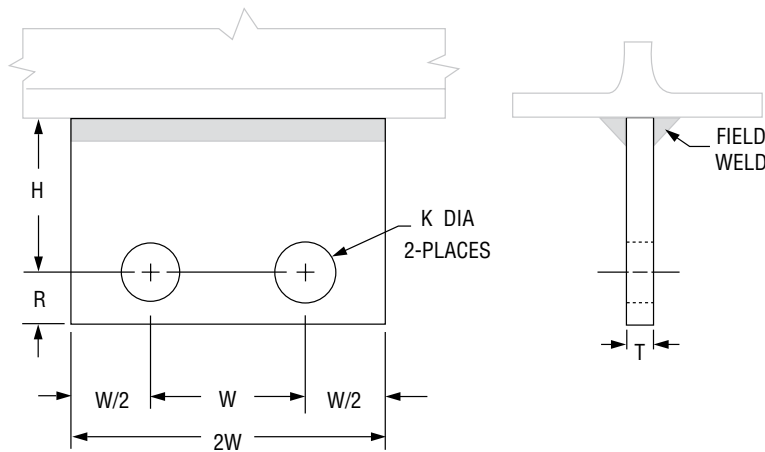
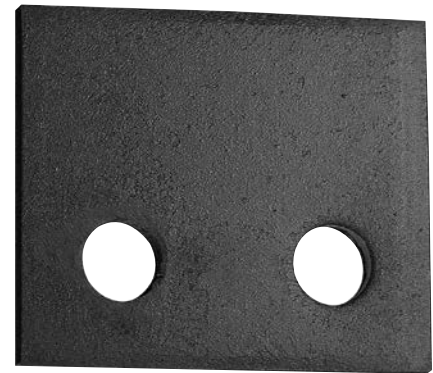


FIG. 54: DIMENSIONS (IN) • LOAD (LBS) • WEIGHT (LBS)

| Rod Size A * | Max Load | Weight "H" Dimension ▲ | | | | Rod Take Out - "H" Dimension Constant Support Frame Sizes | | | | | Pin or Bolt | K Hole | R | T | W | 2W | W/2 |
|-----------------|----------|---------------------------|-----|------|------|--|-------|-------|-------|-------|----------------|-----------|-----|-------|-------|-------|-----|
| | | 1 1/2 | 2 | 3 | 4 | 1-9 | 10-18 | 19-34 | 35-49 | 50-63 | | | | | | | |
| 1/2 | 1,350 | 1.4 | 1.7 | 2.2 | - | 1 1/2 | 2 | 3 | - | 5/8 | 1 1/16 | 1 1/4 | 3/8 | 2 1/2 | 5 | 1 1/4 | |
| 5/8 | 2,160 | 1.4 | 1.6 | 2.2 | - | | | | - | 3/4 | 13/16 | | | | | | |
| 3/4 | 3,230 | 1.3 | 1.6 | 2.1 | 2.6 | - | | | 7/8 | 15/16 | | | | | | | |
| 1 | 5,900 | - | 2.6 | 3.5 | 4.3 | - | - | | 1 1/8 | 1 1/4 | 1 1/2 | 1/2 | 3 | 6 | 1 1/2 | | |
| 1 1/4 | 9,500 | - | 5.0 | 6.5 | 7.9 | - | - | | 1 3/8 | 1 1/2 | 2 | 5/8 | 4 | 8 | 2 | | |
| 1 1/2 | 13,800 | - | - | 10.7 | 12.8 | - | - | | 1 5/8 | 1 3/4 | 2 1/2 | 3/4 | 5 | 10 | 2 1/2 | | |
| 1 3/4 | 18,600 | - | - | 10.4 | 12.5 | - | - | 1 7/8 | 2 | | | | | | | | |
| 2 | 24,600 | - | - | - | 16.0 | - | - | 2 1/4 | 2 3/8 | 3 | 6 | | | | | 12 | 3 |
| 2 1/4 | 32,300 | - | - | - | 15.6 | - | - | 2 1/2 | 2 5/8 | | | | | | | | |

Select "H" dimension applicable to constant support frame size.

▲ Weight varies with "H" dimension.

* Note: Rod size "A" is the assembly rod diameter. Dimension not shown on drawing

Fig. 55 (Short)
Fig. 55L (Long)

Structural Welding Lug

Size Range: Fig. 55: 1/2" through 3 3/4"
Fig. 55L 1/2" through 2"

Material: Carbon steel

Finish: Plain or Hot-Dip Galvanized

Service: For attachment to structural steel in conjunction with the Fig. 299 clevis and with type C variable spring hanger or Type C Constant Support.

Maximum Temperature: Plain 750° F, Galvanized 450° F

Approvals: Complies with Federal Specification A-A-1192A (Type 57), WW-H-171-E (Type 57), ANSI/MSS SP-69 and MSS SP-58 (Type 57).

Ordering: Specify rod size, figure number, name, finish and whether short or long lug is required.

Order Separately: Fig. 291 pin with cotters or bolt and nut

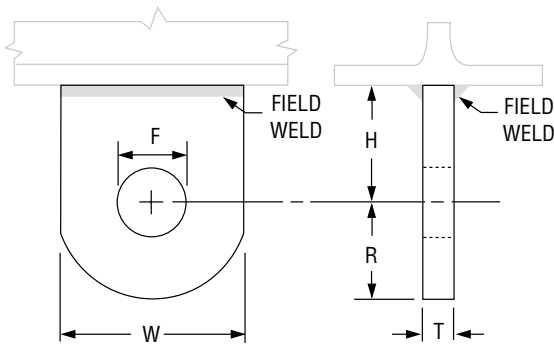


FIG. 55, FIG. 55L: DIMENSIONS (IN) • LOAD (LBS) • WEIGHT (LBS)

| | | Fig. 55, Fig. 55L | | | | Fig. 55 (Short) | | Fig. 55L (Long) | | | |
|-------------|------------------|-------------------|-------|-------|-------|-----------------|--------|------------------|--------|------------------|--------|
| Rod Size A* | Pin or Bolt Dia. | F | R | T | W | Max Load | | Rod Take Out - H | Weight | Rod Take Out - H | Weight |
| | | | | | | 650° F | 750° F | | | | |
| 1/2 | 5/8 | 1 1/16 | 1 1/4 | 1/4 | 2 1/2 | 1,350 | 1,057 | 1 1/2 | 0.48 | 3 | 0.75 |
| 5/8 | 3/4 | 1 3/16 | | | | 2,160 | 1,692 | | 0.41 | | 0.68 |
| 3/4 | 7/8 | 1 5/16 | | 3,230 | | 2,530 | 0.60 | | 1.0 | | |
| 7/8 | 1 | 1 1/8 | | 4,480 | | 3,508 | 0.71 | 0.98 | | | |
| 1 | 1 1/8 | 1 1/4 | 1 1/2 | 1/2 | 3 | 5,900 | 4,620 | 2 | 1.2 | | 1.6 |
| 1 1/4 | 1 3/8 | 1 1/2 | 2 | 5/8 | 4 | 9,500 | 7,440 | 3 | 3.0 | 4 | 3.7 |
| 1 1/2 | 1 5/8 | 1 3/4 | | | | 13,800 | 10,807 | | 4.8 | | 6.4 |
| 1 3/4 | 1 7/8 | 2 | 2 1/2 | 3/4 | 5 | 18,600 | 14,566 | 3 | 4.7 | 4 1/2 | 6.3 |
| 2 | 2 1/4 | 2 3/8 | | | | 24,600 | 19,265 | | 7.2 | | 8.8 |
| 2 1/4 | 2 1/2 | 2 5/8 | 3 | 1 | 6 | 32,300 | 25,295 | 4 | 7.6 | - | - |
| 2 1/2 | 2 3/4 | 2 7/8 | | | | 39,800 | 31,169 | | 15.5 | - | - |
| 2 3/4 | 3 | 3 1/8 | 4 | 1 | 8 | 49,400 | 38,687 | 4 1/2 | 15.1 | - | - |
| 3 | 3 1/4 | 3 3/8 | | | | 60,100 | 47,066 | | 16.0 | - | - |
| 3 1/4 | 3 1/2 | 3 5/8 | 4 1/2 | 1 1/2 | 9 | 71,900 | 56,307 | 5 | 18.9 | - | - |
| 3 1/2 | 3 3/4 | 3 7/8 | | | | 84,700 | 66,331 | | 31.3 | - | - |
| 3 3/4 | 4 | 4 1/8 | 4 1/2 | 1 1/4 | 9 | 98,500 | 77,139 | 6 | 35.9 | - | - |
| | | | | | | | | | | | |

* Note: Rod size "A" is the assembly rod diameter. Dimension not shown on drawing

Fig. 60 (Formerly Afcon Fig. 962)

Steel Washer Plate

Size Range: $\frac{3}{8}$ " through $3 \frac{3}{4}$ "

Material: Carbon steel

Finish: Plain or Hot-Dip Galvanized

Service: A heavy duty washer plate used on top of channels or angles for supporting pipe with rods or U-bolts.

Maximum Temperature: Plain 750° F, Galvanized 450° F

Ordering: Specify rod size, figure number, name and finish.

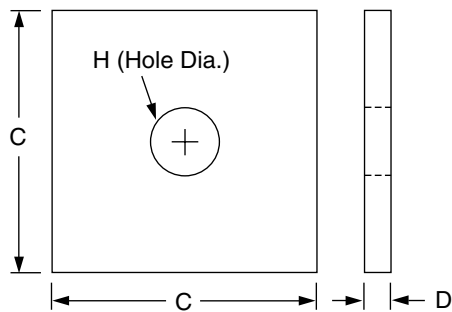
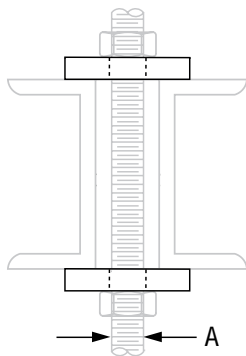
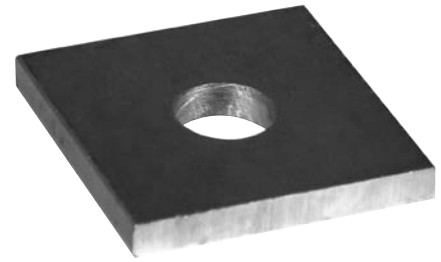


FIG. 60: DIMENSIONS (IN) • WEIGHT (LBS)

| Rod Size A | Weight | Max Load | | C x C x D Size of Stock | Hole Dia. H |
|----------------|--------|----------|--------|----------------------------|----------------|
| | | 650° F | 750° F | | |
| $\frac{3}{8}$ | 0.6 | 730 | 572 | 3 x 3 x $\frac{1}{4}$ | $\frac{1}{2}$ |
| $\frac{1}{2}$ | 0.6 | 1,350 | 1,057 | | $\frac{5}{8}$ |
| $\frac{5}{8}$ | 0.9 | 2,160 | 1,692 | 3 x 3 x $\frac{3}{8}$ | $\frac{3}{4}$ |
| $\frac{3}{4}$ | 1.6 | 3,230 | 2,530 | 4 x 4 x $\frac{3}{8}$ | $\frac{7}{8}$ |
| $\frac{7}{8}$ | 2.2 | 4,480 | 3,508 | 4 x 4 x $\frac{1}{2}$ | 1 |
| 1 | 2.1 | 5,900 | 4,620 | | $1\frac{1}{4}$ |
| $1\frac{1}{4}$ | 3.3 | 9,500 | 7,440 | 5 x 5 x $\frac{1}{2}$ | $1\frac{1}{2}$ |
| $1\frac{1}{2}$ | 4.8 | 13,800 | 10,807 | 5 x 5 x $\frac{3}{4}$ | $1\frac{3}{4}$ |
| $1\frac{3}{4}$ | 4.7 | 18,600 | 14,566 | | 2 |
| 2 | 4.5 | 24,600 | 19,265 | 6 x 6 x $\frac{3}{4}$ | $2\frac{1}{4}$ |
| $2\frac{1}{4}$ | 6.6 | 32,300 | 25,295 | | $2\frac{1}{2}$ |
| $2\frac{1}{2}$ | 6.4 | 39,800 | 31,169 | | $2\frac{3}{4}$ |
| $2\frac{3}{4}$ | 6.2 | 49,400 | 38,687 | | 3 |
| 3 | 5.9 | 60,100 | 47,066 | 7 x 7 x $\frac{3}{4}$ | $3\frac{1}{4}$ |
| $3\frac{1}{4}$ | 5.6 | 71,900 | 56,307 | | $3\frac{1}{2}$ |
| $3\frac{1}{2}$ | 8.1 | 84,700 | 66,331 | 7 x 7 x $\frac{3}{4}$ | $3\frac{3}{4}$ |
| $3\frac{3}{4}$ | 7.8 | 98,500 | 77,139 | | 4 |

Fig. 66

Welded Beam Attachment

Size Range: $\frac{3}{8}$ " through $3\frac{1}{2}$ "

Material: Carbon steel

Finish: Plain or Hot-Dip Galvanized

Service: Recommended for attachment to bottom of beams, especially where loads are considerable and rod sizes are large.

Maximum Temperature: Plain 750° F, Galvanized 450° F

Approvals: Complies with Federal Specification A-A-1192A (Type 22), WW-H-171-E (Type 22), ANSI/MSS SP-69 and MSS SP-58 (Type 22).

Installation: If flexibility at the beam is desired, use with bolt and eye rod Fig. 278, page 124, or with weldless eye nut Fig. 290, page 129. If vertical adjustment is desired, use with threaded rod and nut and weld the attachment in an inverted position to the beam.

Features:

- Will accommodate very heavy loads and rod sizes through $3\frac{1}{2}$ ".
- Can be installed so as to provide for either flexibility or for vertical adjustment.
- Versatility affords economical stocking and erection.
- Beam size need not be considered.

Ordering: Specify rod size, figure number, name and finish. Sizes 1" and smaller are typically supplied with a bolt and nut. Sizes $\frac{1}{4}$ " and larger are typically supplied with a pin and cotters.

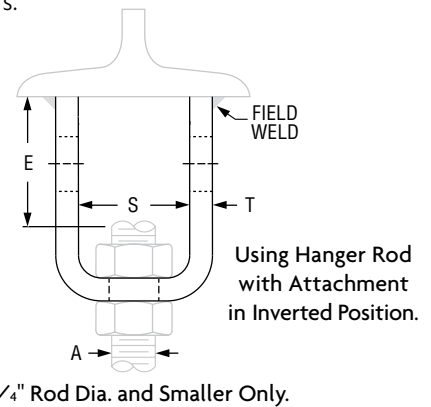
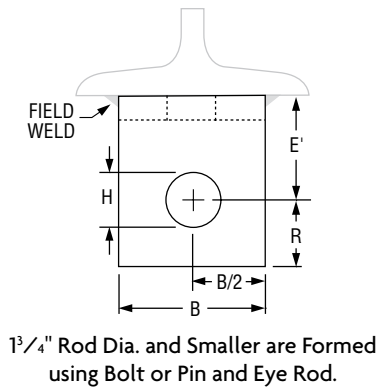
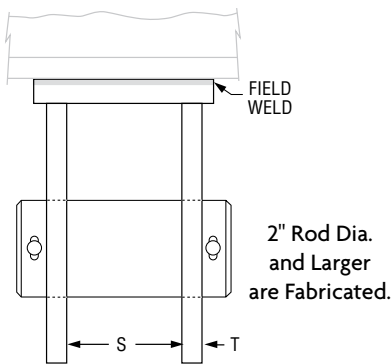
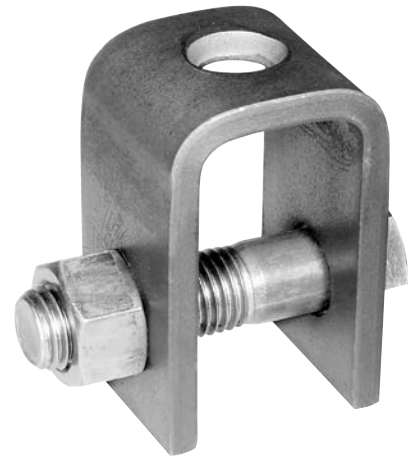


FIG: 66: DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS)

| Rod Size A | Pin or Bolt Size | Max Load | | Weight | | Rod Take Out | | B | H | R | S | T |
|----------------|------------------------------------|----------|--------|----------------------|-------------------|----------------|----------------|-----------------|-----------------|----------------|----------------|----------------|
| | | 650° F | 750° F | Without Bolt and Nut | With Bolt and Nut | E | E' | | | | | |
| $\frac{3}{8}$ | $\frac{1}{2} \times 2\frac{1}{2}$ | 730 | 572 | 0.96 | 1.2 | $1\frac{7}{8}$ | 2 | 2 | $\frac{9}{16}$ | $\frac{7}{8}$ | $1\frac{1}{4}$ | $\frac{1}{4}$ |
| $\frac{1}{2}$ | $\frac{5}{8} \times 2\frac{1}{2}$ | 1,350 | 1,057 | | 1.3 | $1\frac{3}{4}$ | | | $\frac{11}{16}$ | | | |
| $\frac{5}{8}$ | $\frac{3}{4} \times 2\frac{3}{4}$ | 2,160 | 1,692 | | 1.6 | | | | $\frac{13}{16}$ | | | |
| $\frac{3}{4}$ | $\frac{7}{8} \times 4$ | 3,230 | 2,530 | 1.9 | 2.8 | $2\frac{5}{8}$ | $2\frac{1}{2}$ | $\frac{15}{16}$ | $1\frac{1}{8}$ | $1\frac{7}{8}$ | $\frac{3}{8}$ | |
| $\frac{7}{8}$ | 1×4 | 4,480 | 3,508 | 2.5 | 3.9 | | | $1\frac{1}{8}$ | $1\frac{1}{4}$ | 2 | 2 | |
| 1 | $1\frac{1}{8} \times 5$ | 5,900 | 4,620 | 4.3 | 6.3 | $2\frac{3}{4}$ | 3 | 3 | $1\frac{1}{4}$ | $1\frac{1}{2}$ | $2\frac{1}{2}$ | $\frac{1}{2}$ |
| $1\frac{1}{4}$ | $1\frac{3}{8} \times 5\frac{3}{8}$ | 9,500 | 7,440 | 8.1 | 10.2 | $2\frac{7}{8}$ | | 4 | $1\frac{1}{2}$ | 2 | 2 | $\frac{5}{8}$ |
| $1\frac{1}{2}$ | $1\frac{5}{8} \times 6$ | 13,800 | 10,807 | – | 19.0 | – | 4 | 5 | $1\frac{3}{4}$ | $2\frac{1}{2}$ | 3 | $\frac{3}{4}$ |
| $1\frac{3}{4}$ | $1\frac{7}{8} \times 6\frac{7}{8}$ | 18,600 | 14,566 | – | 24.2 | – | | 5 | 6 | 2 | $2\frac{3}{4}$ | |
| 2 | $2\frac{1}{4} \times 6\frac{7}{8}$ | 24,600 | 19,265 | – | 30.6 | – | 5 | | 6 | $2\frac{3}{8}$ | $3\frac{1}{4}$ | $3\frac{1}{2}$ |
| $2\frac{1}{4}$ | $2\frac{1}{2} \times 7\frac{3}{8}$ | 32,300 | 25,295 | – | 36.8 | – | | $2\frac{3}{8}$ | | $3\frac{1}{2}$ | | |
| $2\frac{1}{2}$ | $2\frac{3}{4} \times 7\frac{3}{8}$ | 39,800 | 31,169 | – | 39.7 | – | 5 | 6 | $2\frac{7}{8}$ | $3\frac{3}{4}$ | $3\frac{1}{2}$ | $\frac{5}{8}$ |
| $2\frac{3}{4}$ | 3×7 | 49,400 | 38,687 | – | 40.8 | – | | | $3\frac{1}{8}$ | 4 | | |
| 3 | $3\frac{1}{4} \times 7$ | 60,100 | 47,066 | – | 46.7 | – | 6 | 7 | $3\frac{3}{8}$ | 4 | $4\frac{1}{4}$ | $\frac{3}{4}$ |
| $3\frac{1}{4}$ | $3\frac{1}{2} \times 7\frac{3}{4}$ | 71,900 | 56,307 | – | 62.1 | – | | | $3\frac{7}{8}$ | | | |
| $3\frac{1}{2}$ | $3\frac{3}{4} \times 7\frac{3}{4}$ | 84,700 | 66,331 | – | 72.4 | – | 7 | 8 | $3\frac{7}{8}$ | $4\frac{1}{2}$ | $4\frac{1}{4}$ | $\frac{3}{4}$ |

Fig. 112 Fig. 113

Brace Fitting Complete Pipe End Only

Size Range: 1" and 1 1/4"

Material: Malleable iron bracket and pipe end; hex cap screw and nut.

Finish: Plain

Service: For bracing piping against sway and seismic movement.

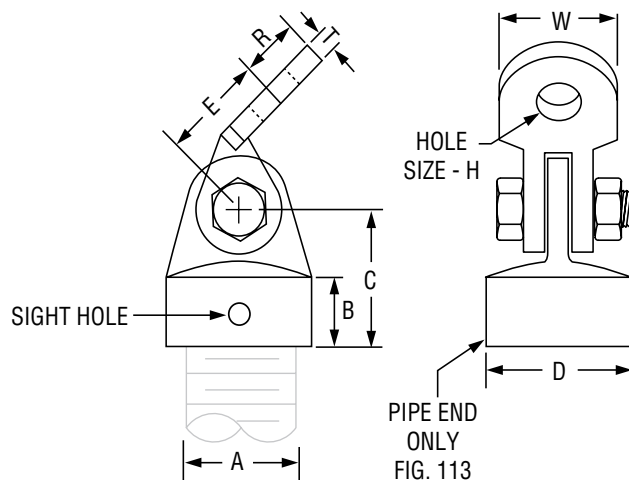
Installation: Normally two fittings are used; a Fig. 112 complete attached to one end of an IPS nipple and a Fig. 113 pipe end only attached to the other end.

The brace fitting completely connects to the building structure while the pipe end only connects to the pipe attachment. Use with Fig. 212 FP pipe clamp see page 55.

Features:

- Two piece pivoted assembly accommodates any angle to structure.
- Sight hole in pipe end provides easy means of verifying proper thread engagement.

Ordering: Specify size, figure number, name.



| FIG. 112, FIG. 113: DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS) | | | | | | | | | | | |
|--|------------|----------|----------|---|--------------------------------|--------------------------------|-------------------------------|------------------|-----------------|------------------|-------------------------------|
| Pipe Size A | Max Load ■ | Weight | | B | C | D | E | Hole Dia. H | R | T | W |
| | | Fig. 112 | Fig. 113 | | | | | | | | |
| 1 | 850 | 0.95 | 0.50 | 1 | 2 ³ / ₁₆ | 1 ¹ / ₁₆ | 1 ¹ / ₂ | 9/ ₁₆ | 3/ ₄ | 1/ ₄ | 1 ¹ / ₂ |
| 1 ¹ / ₄ | 1,150 | 1.40 | 0.80 | | | 2 ³ / ₁₆ | | 3/ ₄ | 7/ ₈ | 5/ ₁₆ | 1 ³ / ₄ |

■ Based on MSS-SP 127 at 450° F and maximum nipple length of 6 feet.

Fig. 152

Screw Concrete Insert

Size Range: 3/8" through 7/8"

Material: Malleable iron

Finish: Plain

Service: Upper attachment for suspending pipe from a concrete ceiling where no lateral adjustment is required.

Approvals: UL, ULC Listed and FM Approved.

Features:

- Eliminates the necessity of drilling holes in wooden forms.
- Reduced overall height and four slots for nail attachment gives stability to the insert while the concrete is being poured.

Ordering: Specify rod size, figure number and name.

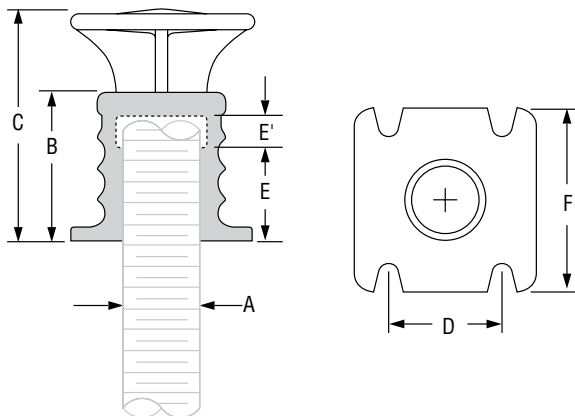


FIG. 152: DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS)

| Rod Size A | Max Load ■ | Weight | B | C | D | E | E' | F |
|---------------|------------|--------|--------|-------|-------|-------|------|-------|
| 3/8 | 730 | 0.31 | 1 1/32 | 2 1/4 | 1 | 1/2 | 3/8 | 1 5/8 |
| 1/2 | 1,130 | 0.32 | | | | 5/8 | | |
| 5/8 | 1,260 | 0.37 | 1 7/32 | 2 1/2 | 1 1/4 | 15/16 | 7/16 | 2 |
| 3/4 | 2,500 | 0.64 | 1 5/8 | | | 1 | 3/8 | |
| 7/8 | | 0.71 | | | | | | |

■ Based on insert only. Rating is subject to the condition that the concrete used is of sufficient strength to hold the insert.

Fig. 281

Wedge Type Concrete Insert

Size Range: $\frac{3}{8}$ " through $\frac{7}{8}$ "

Material: Carbon steel body; malleable iron nut

Finish: Plain or Zinc Plated

Service: Upper attachment for suspending pipe or conduit from concrete ceiling.

Approvals: Complies with Federal Specification A-A-1192A (Type 18), WW-H-171-E (Type 19), ANSI/MSS SP-69 and MSS SP-58 (Type 18). UL, ULC Listed and FM Approved (Sizes $\frac{3}{8}$ " - $\frac{3}{4}$ ").

Installation:

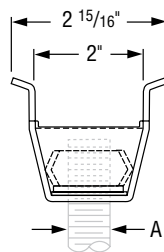
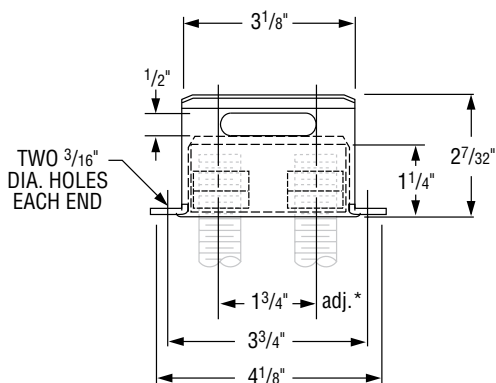
1. Nail insert to wooden forms.
2. Where convenient, reinforcing rods may be placed in the opening through the top of the insert, or short lengths of reinforcing rod may be wired to the insert prior to pouring concrete. However, note that the specified load ratings and approvals are not dependent on the use of any reinforcing rods in contact with the insert.
3. After concrete is poured and forms removed, insert screw driver into slot in knockout plate and snap it out.
4. The nut may be put on the rod before inserting in the insert body. Then, turn rod so that elongated nut lies across the slot; screw rod through nut until rod is firmly against the top of the recess.



Features:

- Nut may be put on hanger rod before insertion, avoiding need of locating nut in insert body prior to inserting rod.
- Insert nut, when located in position, wedges against the sloping sides of insert, providing greater support than if resting on lower edge of the insert body.
- Wedge-shaped body is so held by concrete in compression thus increasing load carrying capacity.
- Easily removed knockout plate.
- Rod can be adjusted along complete length of slot.
- One body for six sizes of rod.

Ordering: Specify figure number, name and size of nut.



| FIG. 281: DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS) | | | |
|---|---------------|---------------|--------|
| | Rod Size A | Max Load ■ | Weight |
| Insert Complete With Nut | $\frac{3}{8}$ | 730 | 0.82 |
| | $\frac{1}{2}$ | 1,130 | 0.86 |
| | $\frac{5}{8}$ | 1,200 | 0.89 |
| | $\frac{3}{4}$ | | 0.86 |
| | $\frac{7}{8}$ | | 0.93 |
| Insert Only | — | — | 0.69 |
| Nut Only | $\frac{1}{4}$ | — | 0.13 |
| | $\frac{3}{8}$ | — | |
| | $\frac{1}{2}$ | — | 0.17 |
| | $\frac{5}{8}$ | — | 0.20 |
| | $\frac{3}{4}$ | — | 0.17 |
| | $\frac{7}{8}$ | — | 0.24 |

■ Based on insert and nut only. Rating is subject to the condition that the concrete used is of sufficient strength to hold the insert.

Fig. 282

Universal Concrete Insert

Size Range: 3/8" through 7/8"

Material: Malleable iron body and nut

Finish: Plain or Zinc Plated

Service: Upper attachment for suspending pipe, shafting, motors and similar equipment from a concrete ceiling; especially suitable where rod sizes cannot be readily determined in advance.

Approvals: Complies with Federal Specification A-A-1192A (Type 18), WW-H-171-E (Type 18), ANSI/MSS SP-69 and MSS SP-58 (Type 18). UL, ULC Listed and FM Approved.

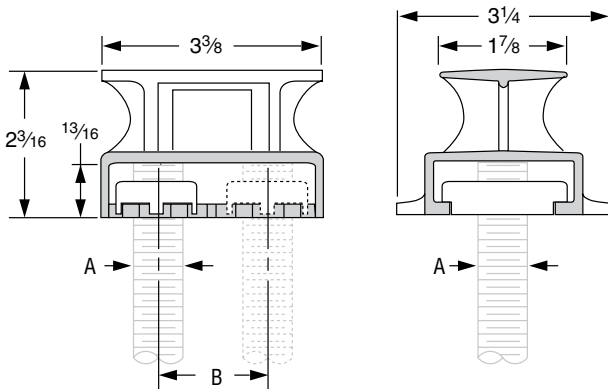
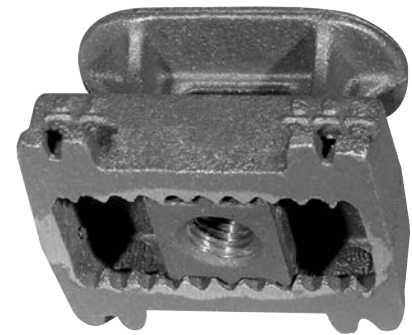
Installation:

1. Nail insert to wooden forms.
2. Where convenient, reinforcing rods may be placed in the opening through the top of the insert, or short lengths of reinforcing rod may be wired to the insert prior to pouring concrete. However, the specified load ratings and approvals are not dependent on the use of any reinforcing rods in contact with the insert.
3. After concrete is poured and wooden forms are removed, place nut in insert and screw rod through nut until rod is firmly against the top of the insert body. The rod should not be forced against the top of the recess thereby placing unnecessary stress at the opening of the insert by the nut.

Features:

- Cast body prevents concrete seepage.
- Opening in top of insert provides for use of reinforcing rods up to 7/8" diameter. Sides of insert are recessed for reinforcing rods up to 1" diameter.
- Low height, broad flat bottom and widely separated nail slots minimize displacement during construction.
- The nut, held in place by V-type teeth on both insert and nut, can be raised and moved from side to side providing for lateral adjustment.
- Rod is locked in place by screwing it firmly against the top of the recess.
- One body size.

Ordering: Specify figure number, name, finish and size of nut.



**FIG. 282:
DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS)**

| | Rod Size A | Adjustment B | Max Load ■ | Weight |
|---|---------------|-----------------|---------------|--------|
| Insert Complete With Nut | 3/8 | 1 11/16 | 730 | 1.5 |
| | 1/2 | | 1,130 | |
| | 5/8 | | 1,140 | |
| | 3/4 | | 1,140 | |
| | 7/8 | 1 1/8 | 1,140 | |
| Insert Only | — | — | — | 1.3 |
| Nut Only | 3/8 | — | — | 0.2 |
| | 1/2 | — | — | |
| | 5/8 | — | — | |
| | 3/4 | — | — | |
| | 7/8 | — | — | |

■ Based on insert and nut only. Rating is subject to the condition that the concrete used is of sufficient strength to hold the insert.

Fig. 284

Metal Deck Hanger

Size Range: 3/8" through 3/4"

Material: Carbon steel

Finish: Plain

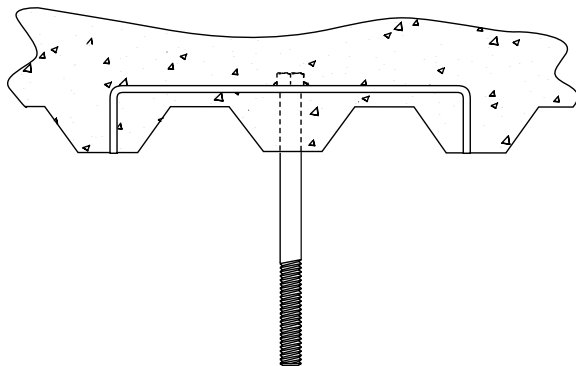
Service: Recommended for suspending pipe or conduit in metal concrete deck forms for a variety of rod sizes. May be used with a rod coupling such as the Fig. 135 or 136 to allow for extended rod lengths.

Features:

- L and H can be specified for a custom fit if your particular deck does not accommodate type A, B, or C.
- Standard 6" long UNC bolt is welded to bracket to ensure assembly remains intact during shipment.

Ordering: Specify Figure 284, design type (A, B, C) and bolt diameter.

If your specific deck will not fit one of the design types and/or a different bolt size is required, specify leg height (H), opening (L) and bolt size.



Before pouring concrete, locate the Figure 284 on deck so legs rest in "valleys" of form. Drill hole in deck for bolt.

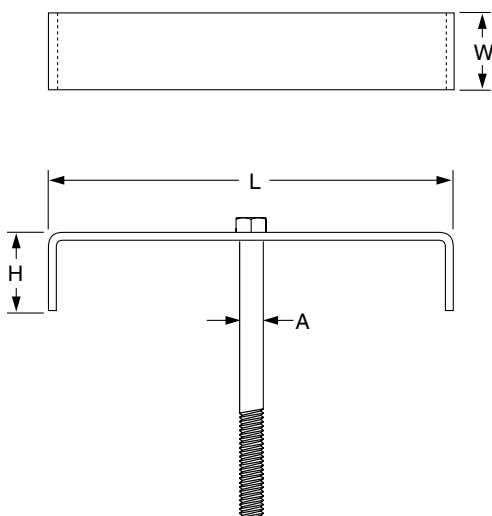


FIG. 284:
DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS)

| Type | Bolt Size A | Max Load ■ | L | H | W | Weight |
|------|-------------|------------|-------|-------|-------|--------|
| A | 3/8 | 730 | 9 5/8 | 1 3/4 | 1 1/2 | 1.33 |
| | 1/2 | 1,350 | | | | 1.43 |
| | 5/8 | 2,160 | | | | 1.64 |
| | 3/4 | 3,230 | | | | 1.92 |
| B | 3/8 | 730 | 12 | 3 | 1 1/2 | 2.23 |
| | 1/2 | 1,350 | | | | 2.33 |
| | 5/8 | 2,160 | | | | 2.54 |
| | 3/4 | 3,230 | | | | 2.82 |
| C | 3/8 | 730 | 16 | 4 | 1 1/2 | 3.10 |
| | 1/2 | 1,350 | | | | 3.20 |
| | 5/8 | 2,160 | | | | 3.41 |
| | 3/4 | 3,230 | | | | 3.69 |

■ Based on the rod diameter only. Rating is subject to the conditions that the concrete used is of sufficient strength to hold the deck hanger.

Fig. 285

Light Weight Concrete Insert

Size Range: 1/4" through 5/8"

Material: Carbon steel

Finish: Plain or Zinc Plated

Service: Upper attachment for suspending pipe or conduit from concrete ceiling.

Approvals: Complies with Federal Specification A-A-1192A (Type 18), WW-H-171-E (Type 18), ANSI/MSS SP-69 and MSS SP-58 (Type 19).

UL, ULC Listed (Sizes 3/8" - 5/8") and FM Approved (Sizes 3/8" and 1/2").

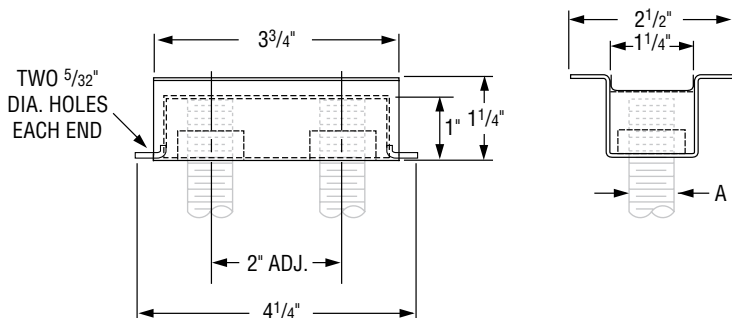
Installation:

1. Nail insert to wooden forms.
2. Reinforcing rods may be located under the arched flanges at the top of the insert. However, note that the specified load ratings and approvals are not dependent on the use of any reinforcing rods in contact with the insert.
3. After concrete is poured and wooden forms are removed, remove knockout by tapping along edge with pointed instrument.
4. Slip nut into insert and screw rod through nut until rod is firmly against the top of the insert body.

Features:

- Suitable for use in concrete 2" thick due to low overall height.
- Highly competitive.
- Provides for 2" of lateral adjustment.
- Knockout prevents seepage of concrete from underneath the insert up into the insert body.
- One body size.
- Removable nut in four sizes.
- Rod can be rigidly locked in position.

Ordering: Specify figure number, name, finish and size of nut.



**FIG. 285:
DIMENSIONS (IN) • LOAD (LBS) • WEIGHT (LBS)**

| | Rod Size A | Max Load ■ | Weight |
|---|---------------|---------------|--------|
| Insert Complete With Nut | 1/4 | 400 | 0.46 |
| | 3/8 | | 0.49 |
| | 1/2 | | 0.49 |
| | 5/8 | | 0.48 |
| Insert Only | — | — | 0.41 |
| Nut Only | 1/4 | — | 0.07 |
| | 3/8 | — | |
| | 1/2 | — | |
| | 5/8 | — | |

■ Based on insert and nut only. Rating is subject to the condition that the concrete used is of sufficient strength to hold the insert.

Fig. 286 (Formerly Fig. 283)

Iron Cross

Size Range: 3/4" through 1 1/2"

Material: Stainless steel body, fiberglass bars, polypropylene disc

Service: Upper attachment for suspending pipe or equipment from concrete ceiling.

Approvals: Complies with Federal Specification A-A-1192A (Type 18) WW-H-171-E (Type 18), ANSI/MSS SP-69 and MSS SP-58 (Type 18).

Installation:

1. Nail insert to wooden forms.
2. Locate fiberglass bars to rest upon existing reinforcing rods or wire the insert directly into existing reinforced rods to achieve the specified load ratings.

Features:

- Stainless steel body prevents corrosion.
- Cone shaped body.
- Exceptional pullout strength.
- Eliminates uncertainty of tying conventional inserts into bridge deck rebars.

Ordering: Specify figure number, name and rod size.

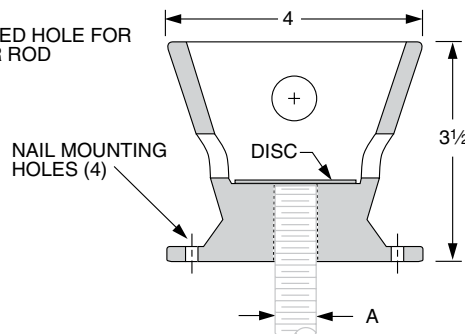
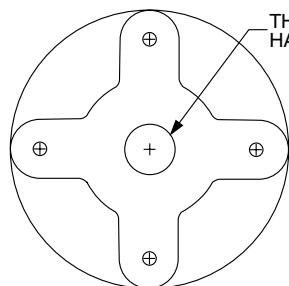
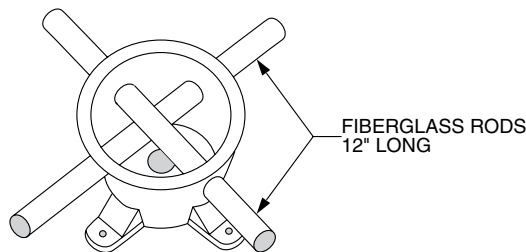
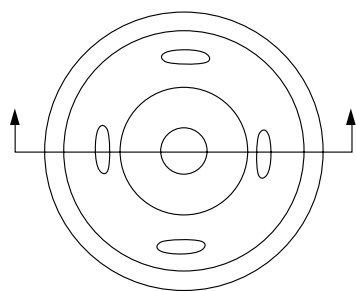


FIG. 286:

| Rod Size A | Max Load (lbs) ■ |
|---------------|---------------------|
| 3/4 | 3,230 |
| 7/8 | 4,480 |
| 1 | 5,900 |
| 1 1/4 | 9,500 |
| 1 1/2 | 13,800 |

■ Based on the rod diameter only. Rating is subject to the conditions that the concrete used is of sufficient strength to hold the insert.

Fig. 47

Concrete Single Lug Plate

Size Range: 1/2" through 2"

Material: Carbon steel

Finish: Plain or Hot-Dip Galvanized

Service: Structural attachment to concrete ceiling lug is used in conjunction with Fig. 299 (see page 130) forged steel clevis and anchors of sufficient strength to hold the desired load.

Ordering: Specify rod size, figure number, name and finish.

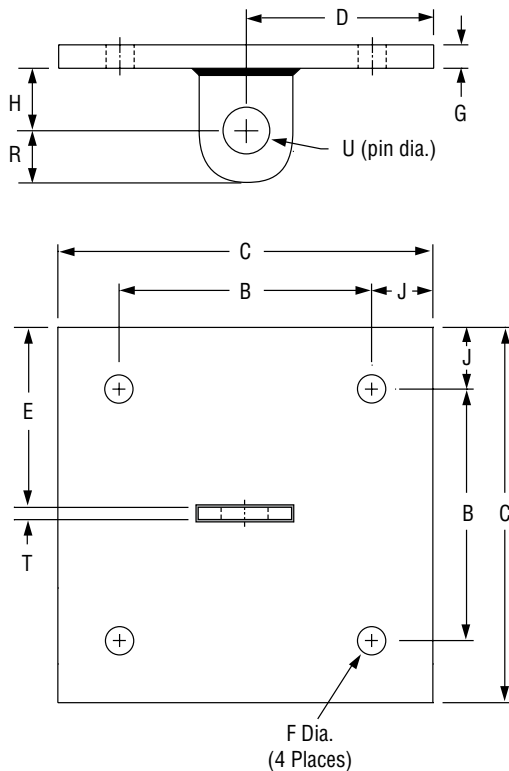


FIG. 47: DIMENSIONS (IN) • LOAD (LBS) • WEIGHT (LBS)

| Rod Size A | Max Load ■ | Weight | J | B | C | D | E | F | G | H | R | T | U |
|---------------|---------------|--------|---|----|----|---|---------|-------|-------|-------|-------|-------|-------|
| 1/2 | 1,350 | 11.1 | 1 | 8 | 10 | 5 | 4 7/8 | 9/16 | 3/8 | 1 1/2 | 1 1/4 | 1/4 | 5/8 |
| 5/8 | 2,160 | 14.6 | | | | | 1/2 | 3/4 | | | | | |
| 3/4 | 3,230 | 14.8 | | | | | 4 13/16 | 11/16 | 3/4 | 2 | | 7/8 | |
| 7/8 | 4,480 | 22.0 | | | | | 5 3/4 | 13/16 | 1 1/2 | 1 1/8 | | 1 | |
| 1 | 5,900 | 31.9 | 2 | 12 | 12 | 6 | 5 11/16 | 15/16 | 1 | 3 | 2 1/2 | 1/2 | 1 3/8 |
| 1 1/4 | 9,500 | 43.8 | | | | | 5 5/8 | 1 1/8 | 3/4 | | | | 1 3/8 |
| 1 1/2 | 13,800 | 45.6 | | | | | 1 3/8 | 1 1/4 | 4 | 3 | | 1 7/8 | |
| 1 3/4 | 18,600 | 55.7 | | | | | 2 1/4 | | | | | | |
| 2 | 24,600 | 58.2 | | | | | | | | | | | 2 1/4 |

■ Based on the rod diameter only. Rating is subject to the conditions that the concrete and anchors used are of sufficient strength to hold the load.

Fig. 49

Concrete Clevis Plate

Size Range: $\frac{3}{8}$ " through $1\frac{3}{4}$ "

Material: Carbon steel

Finish: Plain or Hot-Dip Galvanized with Zinc Plated Fasteners

Service: Structural attachment to concrete ceiling where flexibility is desired. Concrete clevis plate is normally used in conjunction with Fig. 290, page 129, weldless eye nut, or Fig. 278, page 124 welded eye rod and anchors of sufficient strength to hold the desired load.

Ordering: Specify rod size, figure number, name and finish.

Note: Sizes $\frac{3}{8}$ " through 1" are supplied with bolt and nut. Larger sizes are supplied with pin and cotters.

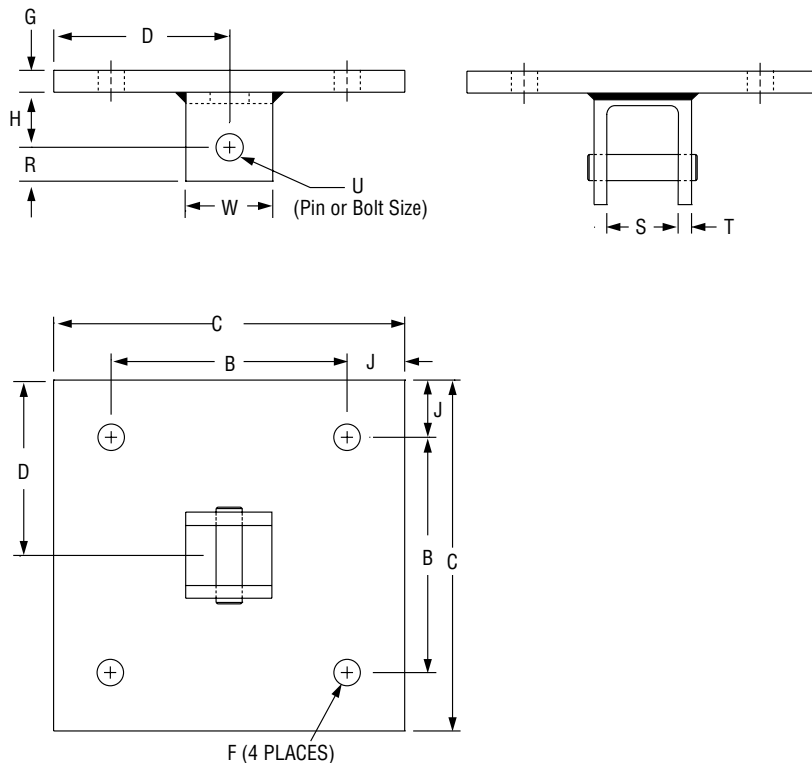


FIG. 49: DIMENSIONS (IN) • LOAD (LBS) • WEIGHT (LBS)

| Rod Size A | Max Load ■ | Weight | J | B | C | D | F | G | H | R | S | T | U | W | | | | |
|----------------|------------|--------|---|----|----|---|-----------------|---------------|---|----------------|----------------|---------------|----------------|---|----------------|----------------|----------------|---|
| $\frac{3}{8}$ | 730 | 11.8 | 1 | 8 | 10 | 5 | $\frac{9}{16}$ | $\frac{3}{8}$ | 2 | $\frac{7}{8}$ | $1\frac{1}{4}$ | $\frac{1}{4}$ | $\frac{1}{2}$ | 2 | | | | |
| $\frac{1}{2}$ | 1,350 | 11.9 | | | | | | $\frac{5}{8}$ | | | | | | | | | | |
| $\frac{5}{8}$ | 2,160 | 15.7 | | | | | $\frac{3}{4}$ | | | | | | | | | | | |
| $\frac{3}{4}$ | 3,230 | 16.9 | | | | | $\frac{7}{8}$ | | | | | | | | | | | |
| $\frac{7}{8}$ | 4,480 | 18.1 | | | | | | 1 | | | | | | | | | | |
| 1 | 5,900 | 36.9 | 2 | 12 | 14 | 6 | $\frac{13}{16}$ | $\frac{1}{2}$ | 3 | $1\frac{1}{8}$ | 2 | $\frac{3}{8}$ | $1\frac{1}{8}$ | 3 | | | | |
| $1\frac{1}{4}$ | 9,500 | 40.9 | | | | | $\frac{15}{16}$ | | | $\frac{1}{4}$ | | 3 | $2\frac{1}{2}$ | | $\frac{5}{8}$ | $1\frac{3}{8}$ | | |
| $1\frac{1}{2}$ | 13,800 | 59.8 | | | | | $1\frac{1}{8}$ | 1 | 4 | $2\frac{1}{2}$ | 3 | $\frac{3}{4}$ | $1\frac{5}{8}$ | | | | | |
| $1\frac{3}{4}$ | 18,600 | 93.6 | | | | | 10 | 14 | 7 | $1\frac{3}{8}$ | $1\frac{1}{4}$ | 5 | $2\frac{3}{4}$ | | $3\frac{1}{2}$ | $\frac{1}{2}$ | $1\frac{7}{8}$ | 4 |
| | | | | | | | | | | | | | | | | | | 5 |

■ Based on the rod diameter only. Rating is subject to the conditions that the concrete and anchors used are of sufficient strength to hold the load.

Fig. 52

Concrete Rod Attachment Plate

Size Range: $\frac{3}{8}$ " through $1\frac{1}{4}$ "

Material: Carbon steel

Finish: Plain or Hot-Dip Galvanized

Service: Structural attachment to concrete ceiling where vertical adjustment is desired. Normally used with threaded rod and nut and anchors of sufficient strength to hold the desired load.

Ordering: Specify rod size, figure number, name and finish.

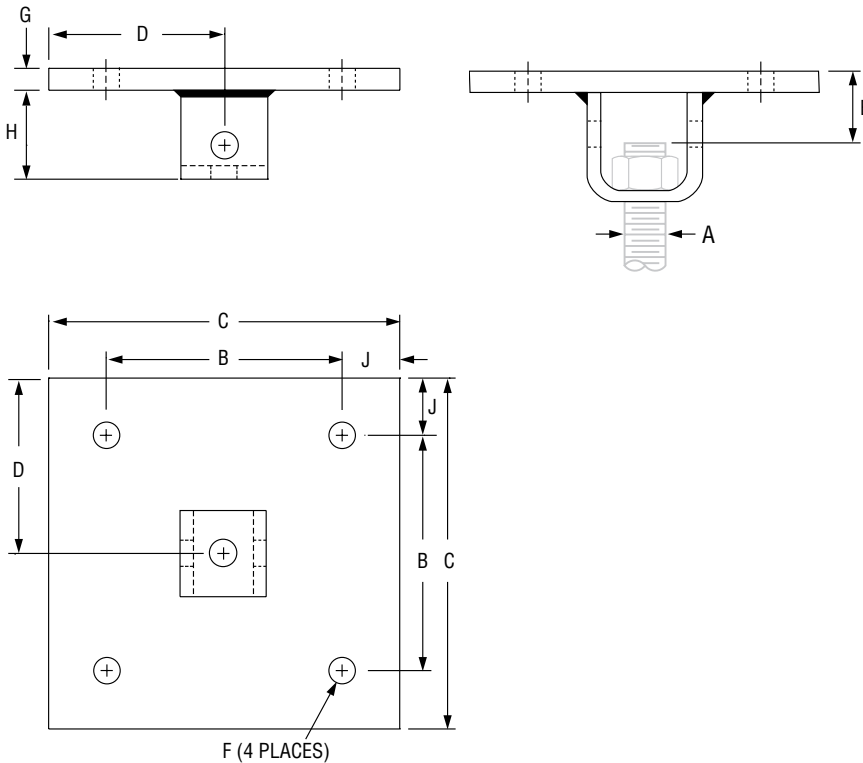


FIG. 52: DIMENSIONS (IN) • LOAD (LBS) • WEIGHT (LBS)

| Rod Size A | Max Load ■ | Weight | J | B | C | D | E | F | H | G |
|----------------|---------------|--------|---|----|----|---|---------------|-----------------|---------------|---------------|
| $\frac{3}{8}$ | 730 | 11.6 | 1 | 8 | 10 | 5 | $\frac{2}{4}$ | $\frac{9}{16}$ | $\frac{2}{8}$ | $\frac{3}{8}$ |
| $\frac{1}{2}$ | 1,350 | 11.6 | | | | | $\frac{2}{8}$ | | | |
| $\frac{5}{8}$ | 2,160 | 15.1 | | | | | $\frac{2}{4}$ | $\frac{11}{16}$ | $\frac{3}{8}$ | $\frac{1}{2}$ |
| $\frac{3}{4}$ | 3,230 | 16.1 | | | | | $\frac{3}{8}$ | | | |
| $\frac{7}{8}$ | 4,480 | 16.7 | 2 | 12 | 12 | 6 | $\frac{3}{2}$ | $\frac{13}{16}$ | $\frac{4}{2}$ | $\frac{3}{4}$ |
| 1 | 5,900 | 34.9 | | | | | $\frac{3}{8}$ | $\frac{15}{16}$ | 5 | |
| $1\frac{1}{4}$ | 9,500 | 40.9 | | | | | | | | |

■ Based on the rod diameter only. Rating is subject to the conditions that the concrete and anchors used are of sufficient strength to hold the load.

Fig. 142 (Formerly Afcon Fig. 920)

Coach Screw Rods Machine Threaded on Opposite End

Size Range: $\frac{3}{8}$ " and $\frac{1}{2}$ "

Material: Carbon steel

Finish: Plain or Zinc Plated

Ordering: Specify rod size, figure number, name and rod length.

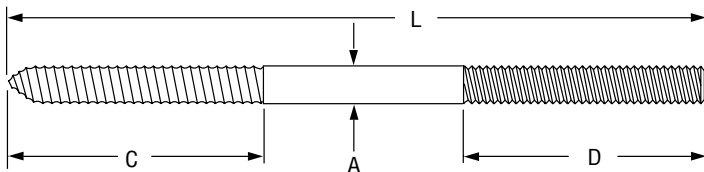


FIG. 142: STANDARD THREAD LENGTHS (IN) • LOADS (LBS)

| Rod Size A | Standard Length - L | Coach Screw Thread Length - C | Standard Rod Thread Length - D | Max Load |
|---------------|------------------------|----------------------------------|-----------------------------------|-------------|
| $\frac{3}{8}$ | $3\frac{1}{2}$ | 2 | $\frac{3}{4}$ | 390 |
| | 8 | | $2\frac{1}{2}$ | |
| $\frac{1}{2}$ | $3\frac{1}{2}$ | $2\frac{7}{16}$ | $\frac{3}{4}$ | 640 |
| | 8 | | $2\frac{1}{2}$ | |

Fig. 146 (Formerly Afcon Fig. 650)

Continuous Threaded Rod

Size Range: $\frac{1}{4}$ " through $1\frac{1}{2}$ " Stocked in six, ten, and twelve foot lengths. Other even foot lengths can be furnished to order.

Material: Carbon steel or Stainless Steel Gr 304

Threads: National Coarse (USS), rod threaded complete length.

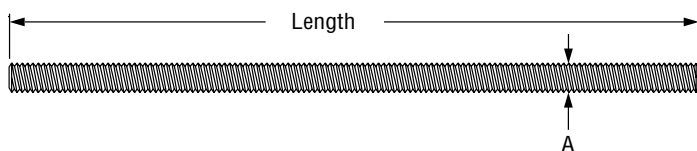
Finish: Plain or Zinc Plated (Hot-Dip Galvanized optional)

Maximum Temperature: Zinc Plated 450°F, Stainless Steel 650° F

Approvals: Complies with MSS SP-58.

Ordering: Specify rod diameter and length, figure number, name and finish.

Note: The acceptability of galvanized coatings at temperatures above 450°F is at the discretion of the end user.



**FIG. 146:
DIMENSIONS (IN) • LOADS (LBS) • WEIGHTS (LBS)**

| Rod Size A | Threads per Inch | Max Load 650° F | Weight per Ft. |
|----------------|---------------------|--------------------|-------------------|
| $\frac{1}{4}$ | 20 | 240 | 0.12 |
| $\frac{3}{8}$ | 16 | 730 | 0.30 |
| $\frac{1}{2}$ | 13 | 1,350 | 0.53 |
| $\frac{5}{8}$ | 11 | 2,160 | 0.84 |
| $\frac{3}{4}$ | 10 | 3,230 | 1.20 |
| $\frac{7}{8}$ | 9 | 4,480 | 1.70 |
| 1 | 8 | 5,900 | 2.30 |
| $1\frac{1}{4}$ | 7 | 9,500 | 3.60 |
| $1\frac{1}{2}$ | 6 | 13,800 | 5.10 |

Fig. 148

Rod with Eye End

Size Range: 2 3/4" through 5"

Material: Carbon steel

Finish: Plain or Zinc Plated

Service: A large diameter rod with eye end for load ratings thru 184,000 pounds.

Ordering: Specify rod size, figure number, name, finish and "L" dimension. Indicate if desired thread length is other than standard.

Note: The acceptability of galvanized coatings at temperatures above 450°F is at the discretion of the end user.

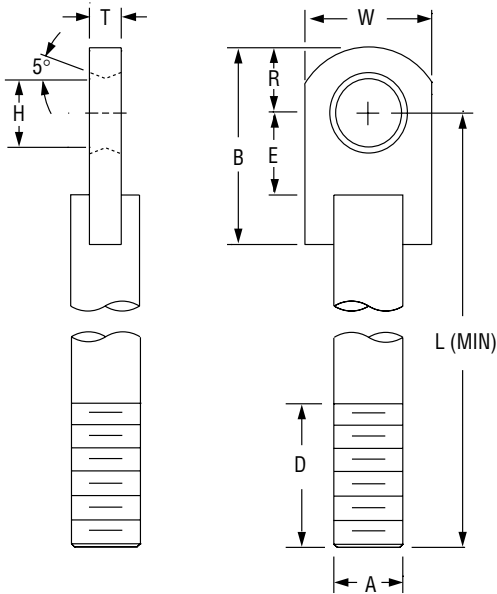


FIG. 148: DIMENSIONS (IN) • LOADS (LBS) • WEIGHTS (LBS)

| Rod Size A | Max Load | | Weight* Min Length | Weight/Ft. Additional Length | B | D | E | H | L (Min) | R | T | W |
|------------|----------|---------|--------------------|------------------------------|--------|-------|-------|-------|---------|-------|-------|-------|
| | 650° F | 750° F | | | | | | | | | | |
| 2 3/4 | 49,400 | 38,687 | 35.9 | 20 | 9 5/8 | 12 | 3 3/4 | 3 1/8 | 19 | 3 5/8 | 1 1/2 | 6 |
| 3 | 60,100 | 47,066 | 42.9 | 24 | 11 | | 4 | 3 3/8 | 20 | 4 | | |
| 3 1/4 | 71,900 | 56,307 | 54.7 | 28 | 12 1/4 | | | 3 5/8 | 21 | 4 1/4 | 7 | |
| 3 1/2 | 84,700 | 66,331 | 67.3 | 33 | 12 1/2 | 15 | 4 3/4 | 3 7/8 | 24 | 4 1/2 | 2 | 7 1/2 |
| 3 3/4 | 98,500 | 77,139 | 80.0 | 37 | 13 3/8 | | 5 | 4 1/8 | 25 | 4 7/8 | | |
| 4 | 113,400 | 88,807 | 97.0 | 43 | 15 1/8 | | | 4 3/8 | 26 | 5 1/8 | | |
| 4 1/4 • | 129,400 | 101,337 | 127.0 | 48 | 16 1/4 | 18 | 5 1/4 | 4 5/8 | 30 | 5 1/2 | 2 1/2 | 9 1/2 |
| 4 1/2 • | 146,600 | 114,807 | 131.0 | 54 | 16 | | 5 3/4 | 4 7/8 | | 31 | | 5 3/4 |
| 4 3/4 • | 164,700 | 128,982 | 154.0 | 60 | 17 | | | 5 1/8 | 31 | 6 | | 9 1/2 |
| 5 • | 184,000 | 144,096 | 175.0 | 67 | 17 3/8 | 6 1/4 | 5 3/8 | 32 | 6 3/8 | 10 | | |

*Weight calculated with minimum "L" for standard thread • Furnished with 4 UN series threads

Fig. 140 (Formerly Afcon Fig. 660): Right-hand Threads

Fig. 253: Right and Left hand Threads

Machine Threaded Rods Threaded Both Ends

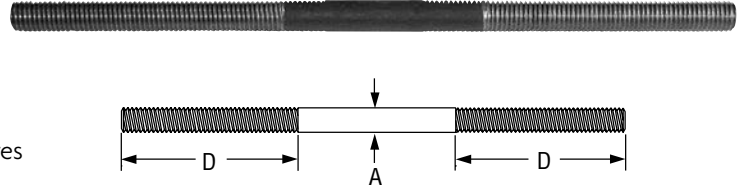
Size Range: $\frac{3}{8}$ " through 5"

Material: Carbon steel

Finish: Plain or Zinc Plated

Ordering: Specify rod size, figure number, name, rod length and finish. Specify thread length if other than standard.

Note: The acceptability of galvanized coatings at temperatures above 450°F is at the discretion of the end user.



| Rod Size A | Threads per Inch | Max Load | | Standard Rod Thread Length D* |
|---------------|------------------|----------|--------|-------------------------------|
| | | 650° F | 750° F | |
| $\frac{3}{8}$ | 16 | 730 | 572 | 2½ |
| $\frac{1}{2}$ | 13 | 1,350 | 1,057 | |
| $\frac{5}{8}$ | 11 | 2,160 | 1,692 | |
| $\frac{3}{4}$ | 10 | 3,230 | 2,530 | 3 |
| $\frac{7}{8}$ | 9 | 4,480 | 3,508 | 3½ |
| 1 | 8 | 5,900 | 4,620 | 4 |
| 1¼ | 7 | 9,500 | 7,440 | 5 |
| 1½ | 6 | 13,800 | 10,807 | 6 |
| 1¾ | 5 | 18,600 | 14,566 | 7 |
| 2 | 4½ | 24,600 | 19,265 | 8 |
| 2¼ | 4½ | 32,300 | 25,295 | 9 |
| 2½ | 4 | 39,800 | 31,169 | 10 |

| Rod Size A | Threads per Inch | Max Load | | Standard Rod Thread Length D* |
|------------|------------------|----------|---------|-------------------------------|
| | | 650° F | 750° F | |
| 2¾ | 4 | 49,400 | 38,687 | 11 |
| 3 | 4 | 60,100 | 47,066 | 12 |
| 3¼ | 4 | 71,900 | 56,307 | 13 |
| 3½ | 4 | 84,700 | 66,331 | 14 |
| 3¾ | 4 | 98,500 | 77,139 | 15 |
| 4 | 4 | 113,400 | 88,807 | |
| 4¼ | 4 UN | 129,400 | 101,337 | 18 |
| 4½ | 4 UN | 146,600 | 114,807 | |
| 4¾ | 4 UN | 164,700 | 128,982 | |
| 5 | 4 UN | 184,000 | 144,096 | |

*Fig. 140 rod up to 1" rod size and 24" in length may be furnished as Fig 146 rod unless order states that all thread rod is not acceptable.

Fig. 248 (Formerly Afcon Fig. 680): Right Hand Threads Eye Rod Not Welded

Fig. 248L: Left Hand Threads

Size Range: $\frac{3}{8}$ " through 2 ½"

Material: Carbon steel

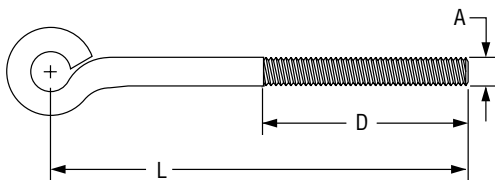
Finish: Plain or Zinc Plated

Maximum Temperature: 650° F

Features: Through 1 ½", inside diameter of eye will accommodate a bolt diameter $\frac{1}{8}$ " larger than rod diameter; 1 ¾" and larger, inside diameter of eye will take a bolt diameter $\frac{1}{4}$ " larger than rod diameter.

Ordering: Specify rod diameter, figure number, name, rod length and finish. Specify thread length if other than standard.

Note: The acceptability of galvanized coatings at temperatures above 450°F is at the discretion of the end user.



| Rod Size A | Standard Rod Thread Length – D | L (min) | Max Load 650° F |
|---------------|--------------------------------|---------|-----------------|
| $\frac{3}{8}$ | 2½ | 4¼ | 240 |
| $\frac{1}{2}$ | | 4½ | 705 |
| $\frac{5}{8}$ | 3 | 5½ | 1,050 |
| $\frac{3}{4}$ | 3½ | 6½ | 1,470 |
| 1 | 4 | 7¼ | 1,940 |
| 1¼ | 5 | 8¼ | 3,120 |
| 1½ | 6 | 10 | 4,650 |
| 1¾ | 7 | 12 | 6,380 |
| 2 | 8 | 14 | 8,280 |
| 2¼ | 9 | 15½ | 10,900 |
| 2½ | 10 | 17 | 13,400 |

Fig. 278 (Formerly Afcon Fig. 681): Right Hand Threads Fig. 278L: Left Hand Threads

Eye Rod Welded

Size Range: $\frac{3}{8}$ " through $2\frac{1}{2}$ "

Material: Carbon steel

Finish: Plain or Zinc Plated

Features: Through $1\frac{1}{2}$ ", inside diameter of eye will accommodate a bolt diameter $\frac{1}{8}$ " larger than rod diameter; $1\frac{3}{4}$ " and larger, inside diameter of eye will take a bolt diameter $\frac{1}{4}$ " larger than rod diameter.

Maximum Temperature: 750° F

Ordering: Specify rod diameter, figure number, name, rod length and finish. Specify thread length if other than standard.

Note: The acceptability of galvanized coatings at temperatures above 450°F is at the discretion of the end user.



**FIG. 278, FIG. 278L:
DIMENSIONS (IN) • LOADS (LBS)**

| Rod Size A | Standard Rod Thread Length - D | L (min) | Max Load | |
|---------------|--------------------------------|---------|----------|--------|
| | | | 650° F | 750° F |
| $\frac{3}{8}$ | 2½ | 4¼ | 730 | 572 |
| $\frac{1}{2}$ | | | 1,350 | 1,057 |
| $\frac{5}{8}$ | | 4½ | 2,160 | 1,692 |
| $\frac{3}{4}$ | 3 | 5½ | 3,230 | 2,530 |
| $\frac{7}{8}$ | 3½ | 6½ | 4,480 | 3,508 |
| 1 | 4 | 7¼ | 5,900 | 4,620 |
| 1¼ | 5 | 8¼ | 9,500 | 7,440 |
| 1½ | 6 | 10 | 13,800 | 10,807 |
| 1¾ | 7 | 12 | 18,600 | 14,566 |
| 2 | 8 | 14 | 24,600 | 19,265 |
| 2¼ | 9 | 15½ | 32,300 | 25,295 |
| 2½ | 10 | 17 | 39,800 | 31,169 |

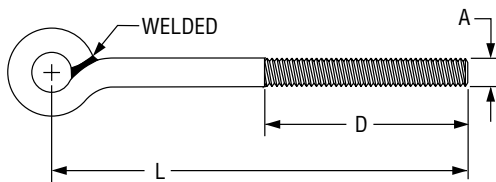


Fig. 248X: Not Welded Fig. 278X: Welded

Linked Eye Rods

Size Range: $\frac{3}{8}$ " through $2\frac{1}{2}$ "

Service: The use of linked eye rods in a hanger assembly allows universal movement of the piping without bending and possible fracture of a straight rod.

Finish: Plain or Zinc Plated

Maximum Temperature: Fig. 248X: 650° F, Fig. 278X: 750° F

Ordering: Specify the size, length of each eye rod, figure number and finish.

Example:

$\frac{7}{8}$ " Fig. 278X linked welded eye rod consisting of:

(L1) $\frac{7}{8}$ " Fig. 278 welded eye rod 1 ft. $2\frac{1}{2}$ in. long, center to end.

(L2) $\frac{7}{8}$ " Fig. 278 welded eye rod 1 ft. $2\frac{1}{2}$ in. long center to end.

Note: The acceptability of galvanized coatings at temperatures above 450°F is at the discretion of the end user.



**FIG. 248X, 278X:
DIMENSIONS (IN) • LOADS (LBS)**

| Rod Size A | Max Load | | |
|---------------|---------------------|-----------|--------|
| | Fig. 248X 650° F | Fig. 278X | |
| | | 650° F | 750° F |
| $\frac{3}{8}$ | 240 | 730 | 572 |
| $\frac{1}{2}$ | 440 | 1,350 | 1,057 |
| $\frac{5}{8}$ | 705 | 2,160 | 1,692 |
| $\frac{3}{4}$ | 1,050 | 3,230 | 2,530 |
| $\frac{7}{8}$ | 1,470 | 4,480 | 3,508 |
| 1 | 1,940 | 5,900 | 4,620 |
| 1¼ | 3,120 | 9,500 | 7,440 |
| 1½ | 4,650 | 13,800 | 10,807 |
| 1¾ | 6,380 | 18,600 | 14,566 |
| 2 | 8,280 | 24,600 | 19,265 |
| 2¼ | 10,900 | 32,300 | 25,295 |
| 2½ | 13,400 | 39,800 | 31,169 |

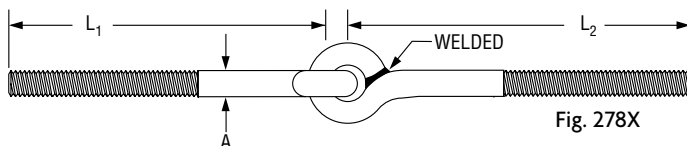
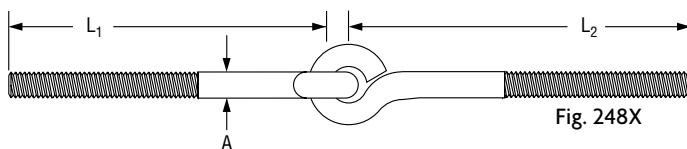
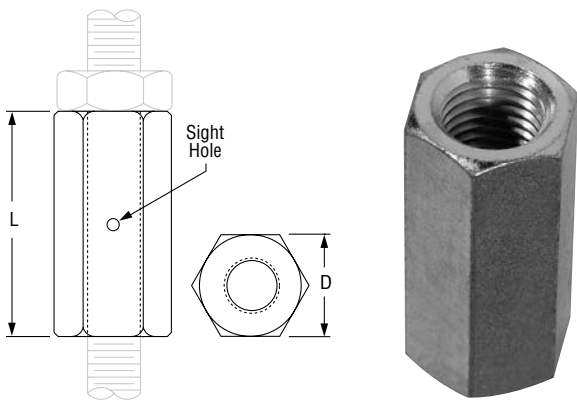


Fig. 135 and 135i: Straight with Sight-Hole Rod Coupling

Fig. 135E: Straight without Sight-Hole

Fig. 135R: Reducing

Size Range: 1/4" through 1"
Material: Carbon steel
Finish: Fig. 135 & 135i: Plain; Fig.135E and Fig.135R: Zinc Plated
Service: For connecting rods to accommodate up to 1" diameter and support up to 5,900 pounds.
Ordering: Specify rod size, figure number and name.



| FIG 135, 135i, 135E, 135R: DIMENSIONS (IN) • LOADS (LBS) • WEIGHTS (LBS) | | | | |
|---|----------|--------|--------|-------|
| Rod Size A | Max Load | Weight | D | L |
| Fig. 135 & 135i: Straight With Sight-Hole | | | | |
| 3/8 | 730 | 0.09 | 9/16 | 1 1/8 |
| 1/2 | 1,350 | 0.12 | 3/4 | 1 1/2 |
| 5/8 | 2,160 | 0.24 | 19/16 | 1 7/8 |
| 3/4 | 3,230 | 0.42 | 1 1/8 | 2 1/4 |
| 7/8 | 4,480 | 0.66 | 1 5/16 | 2 5/8 |
| 1 | 5,900 | 1.00 | 1 1/2 | 3 |
| Fig. 135E: Straight Less Sight-Hole | | | | |
| 1/4 | 240 | 0.03 | 3/8 | 7/8 |
| 3/8 | 730 | 0.09 | 5/8 | 1 1/8 |
| 1/2 | 1,350 | 0.14 | 1 1/16 | 1 3/4 |
| 5/8 | 2,160 | 0.26 | 19/16 | 2 1/8 |
| 3/4 | 3,230 | 0.34 | 1 | 2 1/4 |
| 7/8 | 4,480 | 0.55 | 1 1/4 | 2 1/2 |
| 1 | 5,900 | 0.75 | 1 3/8 | 2 3/4 |
| Fig. 135R: Reducing | | | | |
| 3/8 x 1/4 | 240 | 0.13 | 5/8 | 1 1/2 |
| 1/2 x 3/8 | 730 | 0.13 | 1 1/16 | 1 1/4 |
| 5/8 x 1/2 | 1,350 | 0.19 | 13/16 | 1 1/4 |
| 3/4 x 5/8 | 2,160 | 0.26 | 1 | 1 1/2 |
| 7/8 x 3/4 | 3,230 | 0.41 | 1 1/4 | 1 3/4 |

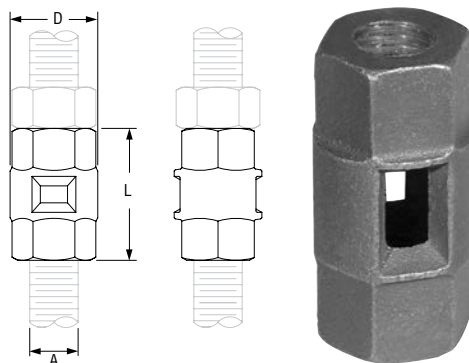
Fig. 136: straight Rod Coupling

Fig. 136R: Reducing

Size Range: 1/4" through 1"
Material: Malleable iron
Finish: Plain or Zinc Plated
Service: For connecting rod lengths within limitation.
Approvals: Fig. 136: UL, ULC Listed (3/8" - 7/8" rod size) and FM Approved (3/8" and 1/2" rod size). Fig. 136R: UL Listed (1/2" and 3/8" rod size).

- Features:**
- Available in reducing sizes.
 - Provides visual inspection of thread engagement.
 - Uniform strength; good appearance.

Ordering: Specify rod tapping size, figure number and name. Furnished with right-hand UNC threads only.



| FIG. 136, 136R: DIMENSIONS (IN) • LOADS (LBS) • WEIGHTS (LBS) | | | | |
|--|----------|--------|--------|---------|
| Rod Size A | Max Load | Weight | L | D |
| Straight: Fig. 136 | | | | |
| 1/4 | 230 | 0.06 | 1 3/8 | 5/8 |
| 3/8 | 730 | 0.10 | 1 5/8 | 1 1/16 |
| 1/2 | 1,350 | 0.20 | 2 1/8 | 1 5/16 |
| 5/8 | 2,160 | 0.33 | 2 1/2 | 1 1/8 |
| 3/4 | 3,230 | 0.44 | 2 5/8 | 1 1/4 |
| 7/8 | 4,480 | 0.96 | 3 1/16 | 1 5/8 |
| 1 | 5,900 | 0.94 | 2 3/4 | 1 13/16 |
| Reducing: Fig. 136R | | | | |
| 1/2 x 3/8 | 730 | 0.21 | 2 1/8 | 2 1/8 |

Fig. 114

Turnbuckle Adjuster

Size Range: 1/4" through 3/4"

Material: Malleable iron

Finish: Plain

Installation: Normally used with split pipe ring, Fig. 108, see page 50.

Approvals: Complies with Federal Specification A-A-1192A (Type 15), WW-H-171-E (Type 15), ANSI/MSS SP-69 and MSS SP-58 (Type 15).

Maximum Temperature: 450° F

Features:

- An economical and simple means of obtaining vertical adjustment and flexibility at the pipe connection.
- Permits adjustment after pipe is in place.

Ordering: Specify rod size, figure number and name.

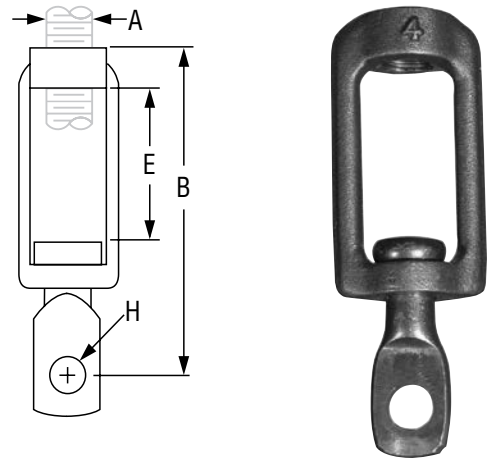


FIG. 114: DIMENSIONS (IN) • LOADS (LBS) • WEIGHTS (LBS)

| Rod Size A | Max Load | Weight | B | E | H |
|------------|----------|--------|-------|---------|-------|
| 1/4 | 230 | 0.09 | 2 1/2 | 1 1/4 | 7/32 |
| 3/8 | 730 | 0.28 | 3 7/8 | 1 7/8 | 13/32 |
| 1/2 | | 0.31 | | 1 13/16 | |
| 5/8 | | 0.72 | | 2 5/16 | |
| 3/4 | 860 | 0.70 | 9/16 | | |

Fig. 230

Turnbuckle

Size Range: 3/8" through 2 1/2"

Material: Forged steel

Finish: Plain or Zinc Plated (Hot-Dip Galvanized optional)

Service: Provides adjustment up to 6" for 12" Fig. 230 and 3" for 6" Fig. 230.

Approvals: Complies with Federal Specification A-A-1192A (Type 13), WW-H-171-E (Type 13), ANSI/MSS SP-69 and MSS SP-58 (Type 13).

Ordering: Specify rod size, figure number, name and finish.

Note: The acceptability of galvanized coatings at temperatures above 450°F is at the discretion of the end user.

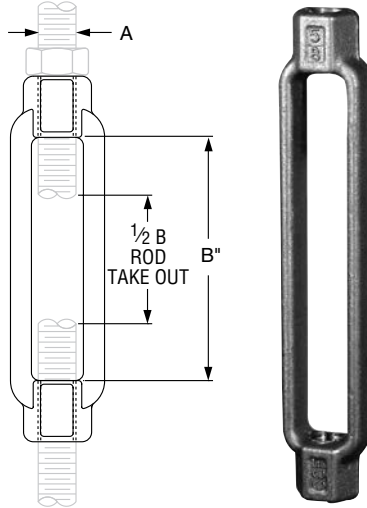


FIG. 230: DIMENSIONS (IN) • LOADS (LBS) • WEIGHTS (LBS)

| Rod Size A • | Max Load | | Weight | |
|-----------------|----------|--------|---------------|---------------|
| | 650°F | 750°F | B= 6" Opening | B=12" Opening |
| 3/8 | 730 | 572 | 0.42 | – |
| 1/2 | 1,350 | 1,057 | 0.65 | 1.20 |
| 5/8 | 2,160 | 1,692 | 0.98 | 1.58 |
| 3/4 | 3,230 | 2,530 | 1.50 | 2.35 |
| 7/8 | 4,480 | 3,508 | 1.90 | 4.05 |
| 1 | 5,900 | 4,620 | 2.60 | 4.02 |
| 1 1/4 | 9,500 | 7,440 | 4.50 | – |
| 1 1/2 | 13,800 | 10,807 | 6.40 | – |
| 1 3/4 | 18,600 | 14,566 | 11.00 | – |
| 2 | 24,600 | 19,265 | 14.90 | – |
| 2 1/4 | 32,300 | 25,295 | 19.60 | – |
| 2 1/2 | 39,800 | 31,169 | 26.90 | – |

• Tapped right hand and left hand thread. Larger rod sizes or openings available upon request

Fig. 233

Turnbuckle

Size Range: 1 1/4" through 5"

Material: Carbon steel

Finish: Plain or Zinc Plated (Hot-Dip Galvanized optional)

Services: Provides adjustments up to 12" with loads up thru 184,000 pounds.

Approvals: Complies with Federal Specification A-A-1192A (Type 13), WW-H-171-E (Type 13), ANSI/MSS SP-69 and MSS SP-58 (Type 13).

Ordering: Specify rod size, figure number, name, finish and opening dimension.

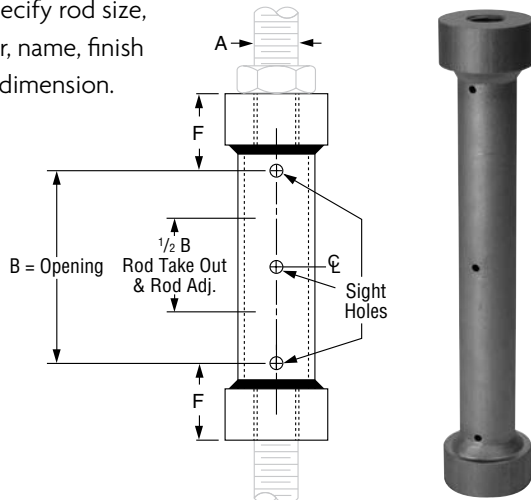


FIG. 233: DIMENSIONS (IN) • LOADS (LBS) • WEIGHTS (LBS)

| Rod Size* A | Max Load | Weight/Opening | | | | F |
|-------------|----------|----------------|-------|-------|--------|---------|
| | | B= 6" | B=12" | B=18" | B=24" | |
| 1 1/4 | 9,500 | – | 9.0 | 10.8 | 12.6 | 2 1/8 |
| 1 1/2 | 13,800 | – | 12.4 | 14.9 | 17.4 | 2 3/8 |
| 1 3/4 | 18,600 | – | 11.7 | 14.2 | 16.7 | |
| 2 | 24,600 | – | 20.9 | 24.7 | 28.5 | 3 3/16 |
| 2 1/4 | 32,300 | – | 29.5 | 34.6 | 39.7 | 3 1/4 |
| 2 1/2 | 39,800 | – | 28.3 | 33.4 | 38.5 | |
| 2 3/4 | 49,400 | 35.6 | 41.8 | 48.1 | 54.3 | 3 1/2 |
| 3 | 60,100 | 41.6 | 49.1 | 56.6 | 64.1 | 3 13/16 |
| 3 1/4 • | 71,900 | 39.6 | 47.0 | 54.5 | 62.0 | |
| 3 1/2 • | 84,700 | 72.5 | 82.9 | 93.3 | 103.7 | 4 1/16 |
| 3 3/4 • | 98,500 | 69.6 | 80.0 | 90.4 | 107.30 | |
| 4 • | 113,400 | 110.7 | 125.1 | 139.4 | 153.6 | 5 |
| 4 1/4 • | 129,400 | 107.1 | 121.5 | 135.7 | 150.0 | |
| 4 1/2 • | 146,600 | 233.5 | 255.2 | 276.9 | 298.6 | 6 13/16 |
| 4 3/4 • | 164,700 | 227.6 | 249.3 | 271.0 | 292.7 | |
| 5 • | 184,000 | 221.4 | 243.1 | 264.8 | 286.5 | |

• Furnished with 4 UN series threads. *Tapped right hand and left hand thread.

Fig. 110R

Socket, Threaded Rod

Size Range: 1/4" through 7/8"

Material: Malleable iron

Finish: Plain

Service: For attaching hanger rod to various types of building attachments

Maximum Temperature: 450° F

Approvals: Complies with Federal Specification A-A-1192A (Type 16)

WW-H-171-E (Type 16), ANSI/MSS SP-69 and MSS SP-58 (Type 16).

UL Listed (Sizes 3/8" - 7/8") and FM Approved (Sizes 3/8" and 1/2").

Installation: Normally used with the split pipe ring Fig. 108, see page 50.

Ordering: Specify rod tapping size, figure number and name.

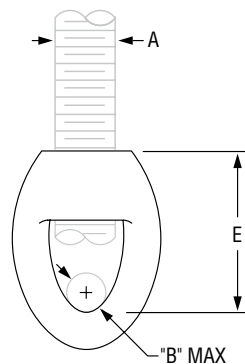


FIG. 110R: DIMENSIONS (IN) • LOADS (LBS) • WEIGHTS (LBS)

| Rod Size A | Max Load | Weight | B | E |
|------------|----------|--------|-----|---------|
| 1/4 | 650 | 0.05 | 1/4 | 1 1/8 |
| 3/8 | 800 | 0.07 | | 1 11/32 |
| 1/2 | 1,000 | 0.13 | | 1 17/32 |
| 5/8 | 1,400 | 0.19 | 3/8 | 1 13/16 |
| 3/4 | 2,200 | 0.31 | 1/2 | 2 5/32 |
| 7/8 | 2,300 | 0.44 | | 2 11/32 |

Fig. 157

Extension piece

Size Range: $\frac{3}{8}$ " through $\frac{7}{8}$ "

Material: Malleable iron

Finish: Plain or Zinc Plated

Maximum Temperature: 450° F

Service: For attaching hanger rod to various types of building attachments.

Approvals: UL Listed ($\frac{3}{8}$ " - $\frac{7}{8}$ " rod size) and FM Approved ($\frac{3}{8}$ " & $\frac{1}{2}$ " rod size).

Installation: May be used to form an integral part of malleable iron beam clamps Fig. 218, see page 89.

Ordering: Specify rod size, figure number, name and finish.

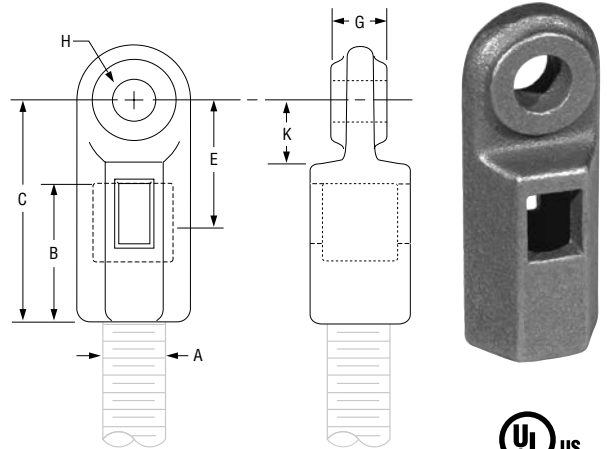


FIG. 157: DIMENSIONS (IN) • LOADS (LBS) • WEIGHTS (LBS)

| Rod Size A | Max Load | Weight | B | C | Rod Take-Out - E | G | H | K |
|---------------|----------|--------|-----------------|------------------|-------------------|---------------|---------------|-----------------|
| $\frac{3}{8}$ | 730 | 0.20 | 1 $\frac{1}{4}$ | 2 $\frac{1}{16}$ | 1 $\frac{1}{4}$ | $\frac{1}{2}$ | $\frac{1}{2}$ | $\frac{9}{16}$ |
| $\frac{1}{2}$ | 1,350 | 0.40 | 1 $\frac{3}{8}$ | 2 $\frac{5}{16}$ | 1 $\frac{3}{8}$ | $\frac{5}{8}$ | | $\frac{11}{16}$ |
| $\frac{5}{8}$ | 1,550 | 0.44 | 1 $\frac{1}{2}$ | 2 $\frac{1}{16}$ | 1 $\frac{7}{16}$ | | | $\frac{3}{4}$ |
| $\frac{3}{4}$ | 2,100 | 0.65 | 1 $\frac{3}{4}$ | 2 $\frac{7}{8}$ | 1 $\frac{11}{16}$ | | | $\frac{7}{8}$ |
| $\frac{7}{8}$ | 2,350 | 0.78 | 1 $\frac{7}{8}$ | 2 | 1 $\frac{3}{4}$ | | | $\frac{3}{4}$ |

Fig. 290: Right-Hand Thread

Weldless Eye Nut

Fig. 290L: Left-Hand Thread

Size Range: $\frac{3}{8}$ " through 2 $\frac{1}{2}$ "

Material: Forged steel

Finish: Plain or Zinc Plated (Hot-Dip Galvanized optional)

Service: For use on high temperature piping installations.

Approvals: Complies with Federal Specification A-A-1192A (Type 17), WW-H-171-E (Type 17), ANSI/MSS SP-69 and MSS SP-58 (Type 17).

Features:

- Supports loads equal to the full limitation of the hanger rod.
- Provides flexible connection when used with straight thread rod.

Ordering: Specify rod size, figure number, name and finish.

If other than standard combination of eye nut number and rod size, specify eye nut number and special rod tapping size.

Note: The acceptability of galvanized coatings at temperatures above 450°F is at the discretion of the end user. Larger eye nuts featuring smaller rod sizes are commonly available.

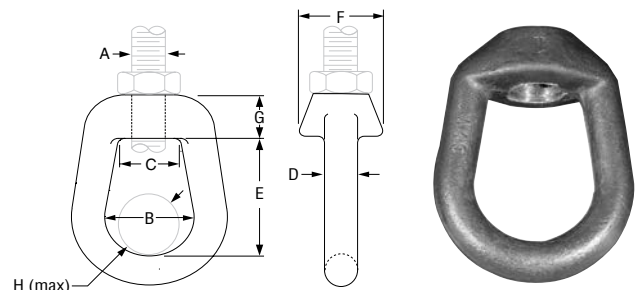


FIG. 290, 290L: DIMENSIONS (IN) • LOADS (LBS) • WEIGHTS (LBS)

| Rod Size A | Max Load | | Weight | B | C | D | E | F | G | H | Eye Nut Number |
|-----------------|----------|--------|--------|------------------|-------------------|------------------|-------------------|-------------------|------------------|-----------------|----------------|
| | 650° F | 750° F | | | | | | | | | |
| $\frac{3}{8}$ | 730 | 572 | 0.28 | 1 $\frac{5}{32}$ | 1 $\frac{3}{16}$ | 1 $\frac{3}{32}$ | 1 $\frac{17}{32}$ | 3 $\frac{1}{32}$ | $\frac{5}{8}$ | 1 | 0 |
| $\frac{1}{2}$ | 1,350 | 1,057 | 0.28 | | | | | | | | |
| $\frac{5}{8}$ | 2,160 | 1,692 | 0.62 | 1 $\frac{1}{2}$ | 1 $\frac{3}{16}$ | $\frac{1}{2}$ | 2 | 1 $\frac{3}{8}$ | 1 $\frac{1}{16}$ | 1 $\frac{1}{4}$ | 1 |
| $\frac{3}{4}$ | 3,230 | 2,530 | 0.60 | | | | | | | | |
| $\frac{7}{8}$ | 4,480 | 3,508 | 1.70 | 2 | 1 $\frac{11}{16}$ | $\frac{3}{4}$ | 2 $\frac{5}{8}$ | 1 $\frac{15}{16}$ | 1 | 1 $\frac{3}{4}$ | 2 |
| 1 | 5,900 | 4,620 | 1.70 | | | | | | | | |
| 1 $\frac{1}{4}$ | 9,500 | 7,440 | 3.60 | 2 $\frac{1}{2}$ | 1 $\frac{13}{16}$ | 1 | 3 $\frac{3}{8}$ | 2 $\frac{3}{8}$ | 1 $\frac{1}{4}$ | 2 $\frac{1}{4}$ | 3 |
| 1 $\frac{1}{2}$ | 13,800 | 10,807 | 3.50 | | | | | | | | |
| 1 $\frac{3}{4}$ | 18,600 | 14,566 | 16.40 | 4 | 4 | 1 $\frac{1}{2}$ | 6 $\frac{1}{4}$ | 4 | 2 $\frac{1}{4}$ | 3 $\frac{3}{4}$ | 4 |
| 2 | 24,600 | 19,265 | 15.90 | | | | | | | | |
| 2 $\frac{1}{4}$ | 32,300 | 25,295 | 15.40 | | | | | | | | |
| 2 $\frac{1}{2}$ | 39,800 | 31,169 | 14.90 | | | | | | | | |

SWIVEL ATTACHMENTS

Fig. 299

Forged Steel Clevis

Size Range: 3/8" through 4"

Material: Forged steel

Finish: Plain or Zinc Plated (Hot-Dip Galvanized optional)

Service: For use on high temperature piping installations.

Approvals: Complies with Federal Specification A-A-1192A (Type 14), WW-H-171-E (Type 14), ANSI/MSS SP-69 and MSS SP-58 (Type 14).

Features:

- Available with pin and cotter pins, if required.

Ordering: Specify rod size, figure number, name and finish. If pin and cotter pins are required, specify "with pin". If other than standard combination of clevis number and rod size is required, specify clevis number, special rod tapping size, pin size, grip.

Note: The acceptability of galvanized coatings at temperatures above 450°F is at the discretion of the end user.

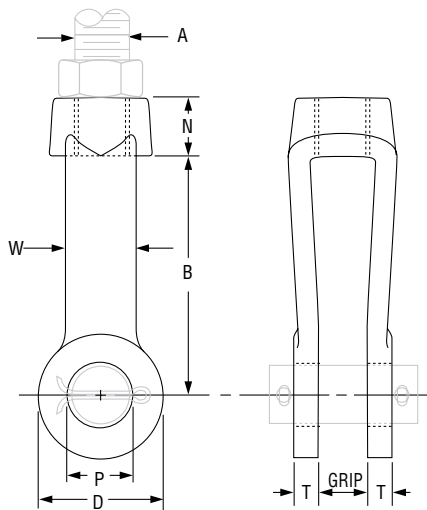


FIG. 299: DIMENSIONS (IN) • LOADS (LBS) • WEIGHTS (LBS)

| Rod Size A | Max Load | | Weight | | Rod Take Out - B | D | N | Pin Dia. P | T | W | Grip | Clevis No. |
|------------|----------|--------|-------------|----------|------------------|--------|--------|------------|-------|--------|-------|------------|
| | 650° F | 750° F | Without Pin | With Pin | | | | | | | | |
| 3/8 | 730 | 572 | 0.9 | 1.0 | 3 1/16 | 1 1/16 | 5/8 | 1/2 | 5/16 | 1 1/16 | 1/2 | 2 |
| 1/2 | 1,350 | 1,057 | 0.7 | 0.9 | | | | 5/8 | | | 5/8 | |
| 5/8 | 2,160 | 1,692 | 0.7 | 0.9 | | | | 3/4 | | | 3/4 | |
| 3/4 | 3,230 | 2,530 | 2.5 | 3.0 | 4 | 2 1/2 | 1 | 7/8 | 5/16 | 1 5/16 | 3/4 | 2 1/2 |
| 7/8 | 4,480 | 3,508 | 2.5 | 3.4 | | | | 1 | | 7/8 | | |
| 1 | 5,900 | 4,620 | 4.0 | 5.1 | 5 | 3 | 1 5/16 | 1 1/8 | 1/2 | 1 1/2 | 1 | 3 |
| 1 1/4 | 9,500 | 7,440 | 3.8 | 5.5 | | | | 1 3/8 | | 1 1/4 | | |
| 1 1/2 | 13,800 | 10,807 | 6.0 | 8.5 | 6 | 3 1/2 | 1 5/8 | 1 5/8 | | 1 3/4 | 1 1/2 | 3 1/2 |
| 1 3/4 | 18,600 | 14,566 | 8.0 | 12.9 | | | | 4 | 1 3/4 | 1 7/8 | 2 | 4 |
| 2 | 24,600 | 19,265 | 16.0 | 23.3 | 7 | 5 | 2 1/4 | 2 1/4 | 5/8 | 2 1/2 | 5 | |
| 2 1/4 | 32,300 | 25,295 | 26.0 | 35.1 | 8 | 6 | 2 3/4 | 2 1/2 | 3/4 | 3 | 2 1/2 | 6 |
| 2 1/2 | 39,800 | 31,169 | 25.5 | 36.0 | | | | 2 3/4 | | | | |
| 2 3/4 | 49,400 | 38,687 | 36.0 | 50.0 | 9 | 7 | 3 | 3 | 7/8 | 3 1/2 | 7 | |
| 3 | 60,100 | 47,066 | 35.0 | 51.5 | | | | 3 1/4 | | | | |
| 3 1/4 • | 71,900 | 56,307 | 90.0 | 116.0 | 10 | 8 | 4 | 3 1/2 | 1 1/2 | 4 | 4 | 8 |
| 3 1/2 • | 84,700 | 66,331 | 88.0 | 118.0 | | | | 3 3/4 | | | | |
| 3 3/4 • | 98,500 | 77,139 | 86.0 | 120.0 | | | | 4 | | | | |
| 4 • | 113,400 | 88,807 | 84.0 | 122.0 | | | | 4 1/4 | | | | |

• Furnished with 4 UN series threads.

Fig. 291

Clevis Pin with Cotters

Size Range: 1/2" through 4"

Material: Carbon steel

Finish: Plain or Zinc Plated (Hot-Dip Galvanized optional)

Maximum Temperature: 650° F

Service: For use with type C variable spring hanger, type C constant support (Fig. 81-H only) and Fig. 66 welded beam attachment.

Ordering: Specify pin diameter, figure number, name, finish and if cotter pins are required.

Note: The acceptability of galvanized coatings at temperatures above 450° F is at the discretion of the end user.

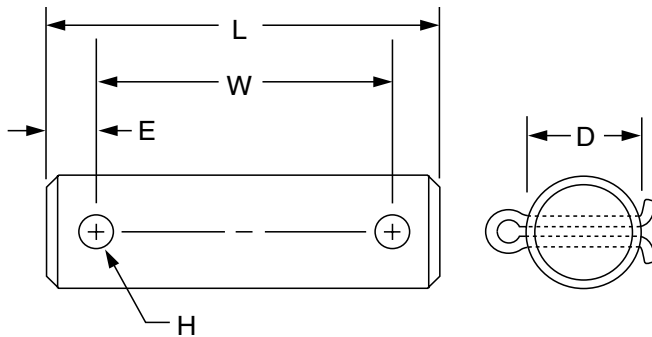


FIG. 291: DIMENSIONS (IN) • LOADS (LBS) • WEIGHTS (LBS)

| Pin Dia. D | Max Load | | Weight | L | W | E | H | Cotter Pin Size |
|---------------|----------|--------|--------|-------|-------|-----|------|-----------------|
| | 650° F | 750° F | | | | | | |
| 1/2 | 730 | 572 | 0.12 | 2 7/8 | 2 1/8 | 3/8 | 5/32 | 1/8 x 1 1/4 |
| 5/8 | 1,350 | 1,057 | 0.18 | 3 1/8 | 2 3/8 | | 7/32 | 3/16 x 1 1/2 |
| 3/4 | 2,160 | 1,691 | 0.29 | 3 5/8 | 2 7/8 | | | |
| 7/8 | 3,230 | 2,529 | 0.47 | 4 1/4 | 3 1/2 | | | |
| 1 | 4,480 | 3,508 | 0.67 | 4 | 3 1/4 | 1/2 | 9/32 | 3/16 x 2 |
| 1 1/8 | 5,900 | 4,620 | 1.00 | 4 3/4 | 4 | | | 1/4 x 2 1/2 |
| 1 1/8 | 9,500 | 7,439 | 2.10 | 5 3/8 | 4 3/8 | 5/8 | 3/8 | 1/4 x 3 |
| 1 5/8 | 13,800 | 10,805 | 3.30 | 6 | 5 | | | 3/8 x 3 |
| 1 7/8 | 18,600 | 14,564 | 4.80 | 7 1/8 | 5 7/8 | | | 3/8 x 3 1/4 |
| 2 1/4 | 24,600 | 19,262 | 7.20 | 7 5/8 | 6 3/8 | | | 3/8 x 3 3/4 |
| 2 1/2 | 32,300 | 25,291 | 9.30 | 7 7/8 | 6 5/8 | 3/4 | 1/2 | 3/8 x 4 |
| 2 3/4 | 39,800 | 31,163 | 12.50 | 7 7/8 | 6 5/8 | | | 1/2 x 5 |
| 3 | 49,400 | 38,680 | 16.60 | 8 1/4 | 6 3/4 | 3/4 | 1/2 | 1/2 x 6 |
| 3 1/4 | 60,100 | 47,058 | 20.00 | 8 1/2 | 7 | | | |
| 3 1/2 | 71,900 | 56,298 | 23.90 | 8 3/4 | 7 1/4 | | | |
| 3 3/4 | 84,700 | 66,320 | 25.10 | 9 1/2 | 8 | | | |
| 4 | 98,500 | 77,125 | 34.80 | 9 3/4 | 8 1/4 | | | |

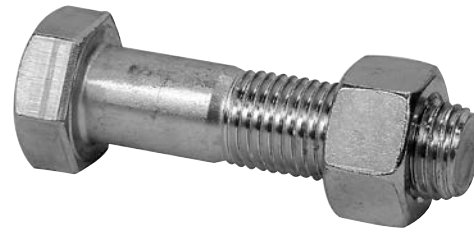
Machine Bolts

Size Range: American Standard hexagon head bolts with American Standard hexagon nuts are stocked in sizes $\frac{3}{8}$ " through $1\frac{1}{8}$ " UNC thread series. Other sizes are available upon request.

Lengths of bolts are measured from under head to extreme point.

Finish: Plain or Electroplated

Ordering: Specify bolt size, name and length.



Hexagon Nuts

Size Range:

- American Standard hexagon nuts - sizes $\frac{1}{4}$ " thru $1\frac{1}{2}$ ".
- American Standard heavy hexagon flat nuts - sizes $1\frac{3}{4}$ " thru $3\frac{3}{4}$ ".

Finish: Plain or Electroplated

Ordering: Specify bolt or rod size and name.

| HEX NUTS: DIMENSIONS (IN) | | |
|---------------------------|-----------------|------------------|
| Bolt /Rod Size | Width | Thickness |
| $\frac{1}{4}$ | $\frac{7}{16}$ | $\frac{15}{64}$ |
| $\frac{3}{8}$ | $\frac{9}{16}$ | $\frac{11}{32}$ |
| $\frac{1}{2}$ | $\frac{3}{4}$ | $\frac{29}{64}$ |
| $\frac{5}{8}$ | $\frac{15}{16}$ | $\frac{9}{16}$ |
| $\frac{3}{4}$ | $1\frac{1}{8}$ | $\frac{43}{64}$ |
| $\frac{7}{8}$ | $1\frac{5}{16}$ | $\frac{25}{32}$ |
| 1 | $1\frac{1}{2}$ | $\frac{57}{64}$ |
| $1\frac{1}{4}$ | $1\frac{7}{8}$ | $1\frac{3}{32}$ |
| $1\frac{3}{8}$ | $2\frac{1}{16}$ | $1\frac{13}{64}$ |
| $1\frac{1}{2}$ | $2\frac{1}{4}$ | $1\frac{5}{16}$ |

| HEAVY HEX NUTS: DIMENSIONS (IN) | | |
|---------------------------------|----------------|------------------|
| Bolt /Rod Size | Width | Thickness |
| $1\frac{3}{4}$ | $2\frac{3}{4}$ | $1\frac{25}{32}$ |
| 2 | $3\frac{1}{8}$ | $2\frac{1}{32}$ |
| $2\frac{1}{4}$ | $3\frac{1}{2}$ | $2\frac{19}{64}$ |
| $2\frac{1}{2}$ | $3\frac{7}{8}$ | $2\frac{35}{64}$ |
| $2\frac{3}{4}$ | $4\frac{1}{4}$ | $2\frac{13}{16}$ |
| 3 | $4\frac{5}{8}$ | $3\frac{1}{16}$ |
| $3\frac{1}{4}$ ■ | 5 | $3\frac{5}{16}$ |
| $3\frac{1}{2}$ ■ | $5\frac{3}{8}$ | $3\frac{9}{16}$ |
| $3\frac{3}{4}$ ■ | $5\frac{3}{4}$ | $3\frac{13}{16}$ |

■ Furnished with 8 UN or 4 UN threads as required.

Fig. 62, Type A, B and C

Pipe Stanchion

Size Range: 2" through 18"

Material: Carbon steel

Finish: Plain or Hot-Dip Galvanized

Service: Stanchion type of support for stationary pipe where vertical adjustment is required.

Maximum Temperature: Plain 650° F, Galvanized 450° F

Ordering: Specify figure number, type, pipe size, top stanchion size, material specification and "D" dimension. For base plates that require holes, also specify hole size, and the center line to center line of the holes.

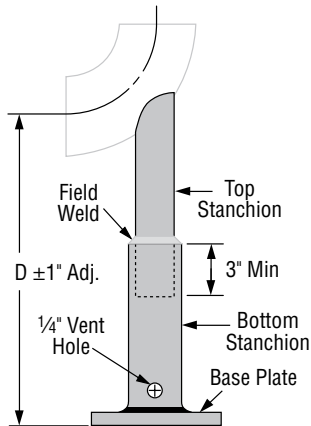


Fig. 62, Type A
(L. R. Elbow) with adjustable base

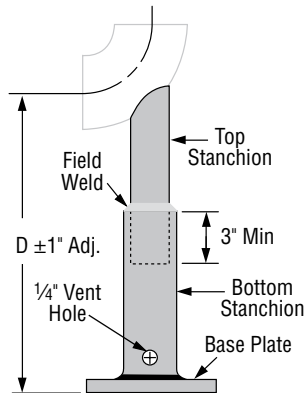


Fig. 62, Type B
(S. R. Elbow) with adjustable base

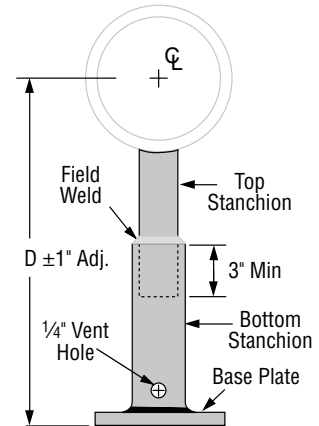


Fig. 62, Type C
(Horizontal Pipe) with adjustable base

| Pipe or Elbow Size (in) | Top Stanchion Size (Standard Weight Pipe) | | | |
|-------------------------|---|----|----|----|
| | 1½ | 2½ | 4 | 5 |
| 2 | • | | | |
| 2½ | • | | | |
| 3 | • | • | | |
| 4 | • | • | | |
| 5 | • | • | • | |
| 6 | | • | • | • |
| 8 | | | • | • |
| 10 | | | • | • |
| 12 | | | | • |
| 14 | | | | • |
| 16 | | | | • |
| 18 | | | | • |
| Weight (Lbs) | 12 | 28 | 55 | 75 |

- Indicates available stanchion size for pipe or elbow size.
- Weights based on a "D" dimension of 2'-0".

| DIMENSIONS (IN) | | |
|-----------------|------------------|-------------|
| Top Stanchion | Bottom Stanchion | Base Plate |
| 1½ | 2 Std. | ¾ x 6 x 6 |
| 2½ | 3 Std. | ¾ x 10 x 10 |
| 4 | 5 Sch. 80 | ¾ x 10 x 10 |
| 5 | 6 Sch. 80 | ¾ x 10 x 10 |



Fig. 62
Stanchion with Adjustable Base

STANCHIONS & SUPPORTS

Fig. 63, Type A, B, C, P and T (Type P is Formerly Afcon Fig. 722) Pipe Stanchion

Material: Carbon steel

Finish: Plain or Hot-Dip Galvanized

Maximum Temperature: Plain 650° F, Galvanized 450° F

To Order Specify:

Type A, B, C: Figure Number, Type, Pipe Size, Stanchion Size, Material Specification and "D" Dimension.

Type P: Figure Number, Type, Saddle Size, Stanchion Size, Material Specification and "H" Dimension.

Type T: Figure Number, Type, Saddle Figure Number and Size, Stanchion Size, Material Specification and "H" Dimension.

For base plates that require holes, also specify hole size, and the center line to center line of the holes.

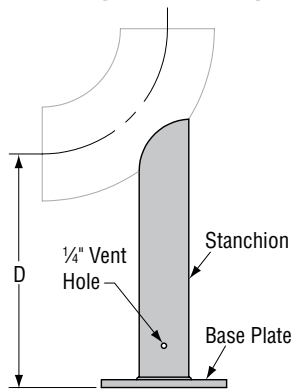


Fig. 63, Type A
(L. R. Elbow)

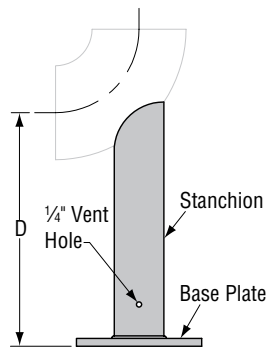


Fig. 63, Type B
(S. R. Elbow)

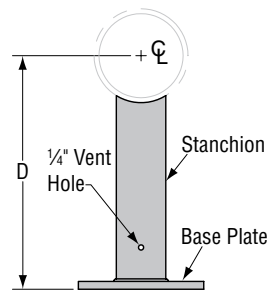


Fig. 63, Type C
(Horizontal Pipe)

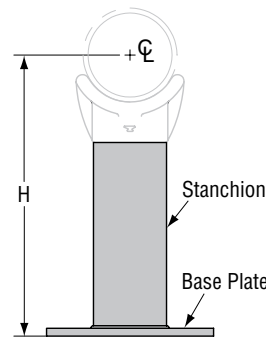


Fig. 63, Type P
Square Cut End for use with Figure 258 or 259 Pipe Saddle Support (See pages 137 & 138)

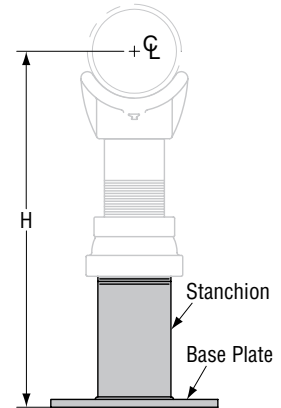


Fig. 63, Type T
Square Cut Threaded End for use with Figure 264 or 265 Adjustable Pipe Saddle Support (See pages 139 & 140)

| Pipe or Elbow Size (in) | Stanchion Size (Standard Weight Pipe) | | | | | | | | | | | | | |
|-------------------------|---------------------------------------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|
| | 1½ | 2 | 2½ | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 20 | 24 |
| 2½ | • | • | | | | | | | | | | | | |
| 3 | • | • | • | | | | | | | | | | | |
| 4 | • | • | • | • | | | | | | | | | | |
| 5 | • | • | • | • | • | | | | | | | | | |
| 6 | | | • | • | • | • | | | | | | | | |
| 8 | | | | • | • | • | • | | | | | | | |
| 10 | | | | | • | • | • | • | | | | | | |
| 12 | | | | | | • | • | • | • | | | | | |
| 14 | | | | | | | • | • | • | • | | | | |
| 16 | | | | | | | | • | • | • | • | | | |
| 18 | | | | | | | | | • | • | • | • | | |
| 20 | | | | | | | | | | • | • | • | • | |
| 22 | | | | | | | | | | | • | • | • | • |
| 24 | | | | | | | | | | | | • | • | • |
| 26 | | | | | | | | | | | | | • | • |
| 28 | | | | | | | | | | | | | | • |
| 30 | | | | | | | | | | | | | | • |
| 32 | | | | | | | | | | | | | | • |
| 34 | | | | | | | | | | | | | | • |
| 36 | | | | | | | | | | | | | | • |
| 42 | | | | | | | | | | | | | | • |
| Weight (Lbs) | 9.5 | 11.6 | 16.4 | 23.7 | 31.8 | 47.0 | 59.0 | 100.0 | 164.0 | 201.0 | 230.0 | 282.0 | 374.0 | 515.0 |

• Indicates available stanchion size for pipe or elbow size for Types A, B, or C stanchions.

• Weights based on a "D" dimension of 2'-0".

See Figure 258, 259, 264, or 265 dimensional data for required stanchion pipe size (nominal pipe size A).

DIMENSIONS (IN)

| Stanchion Size | Base Plate |
|----------------|-------------|
| 1½ | ¾ x 6 x 6 |
| 2 | |
| 2½ | ¾ x 8 x 8 |
| 3 | |
| 4 | |
| 5 | ¾ x 10 x 10 |
| 6 | |
| 8 | ¾ x 14 x 14 |
| 10 | |
| 12 | ½ x 18 x 18 |
| 14 | |
| 16 | ½ x 22 x 22 |
| 20 | |
| 24 | ½ x 30 x 30 |



Fig. 63
Stanchion

Fig. 191

Adjustable Pipe Saddle with U-Bolt

Size Range: 2" through 12"

Material: Carbon steel

Finish: Plain or Zinc Plated (Hot-Dip Galvanized optional)

Service: Stanchion type support where vertical adjustment is required, plus the additional **stability** provided by U-bolt attachment to **stationary** pipe.

Approvals: Complies with Federal Specification A-A-1192A (Type 37), ANSI/MSS SP-69 and MSS SP-58 (Type 37).

Ordering: Specify pipe size, figure number, name and finish.

| FIG. 191: DIMENSIONS (IN) • WEIGHTS (LBS) | | | | | |
|---|------------|---------------------------------|----------------------------------|-------------|--------|
| Pipe Size | Rod Size A | C | E | G | Weight |
| 2 | 5/8 | 2 ¹ / ₁₆ | 9 ⁷ / ₁₆ | 1/4 x 1 | 1.2 |
| 2 1/2 | | 3 ⁵ / ₁₆ | 9 ¹ / ₁₆ | | 1.4 |
| 3 | | 3 ¹⁵ / ₁₆ | 10 | | 1.6 |
| 3 1/2 | | 4 ⁷ / ₁₆ | 10 ¹ / ₄ | | 2.6 |
| 4 | 7/8 | 5 ¹ / ₄ | 10 ¹ / ₂ | 1/4 x 1 1/4 | 3.0 |
| 5 | | 6 ¹ / ₈ | 11 | | 3.2 |
| 6 | 1 | 7 ¹ / ₄ | 11 ¹¹ / ₁₆ | 3/8 x 1 1/2 | 4.9 |
| 8 | | 9 ³ / ₈ | 12 ¹¹ / ₁₆ | | 6.2 |
| 10 | 1 1/4 | 11 ¹ / ₂ | 13 ³ / ₈ | 1/2 x 2 | 10.5 |
| 12 | | 13 ¹ / ₂ | 14 ⁷ / ₈ | | 11.8 |

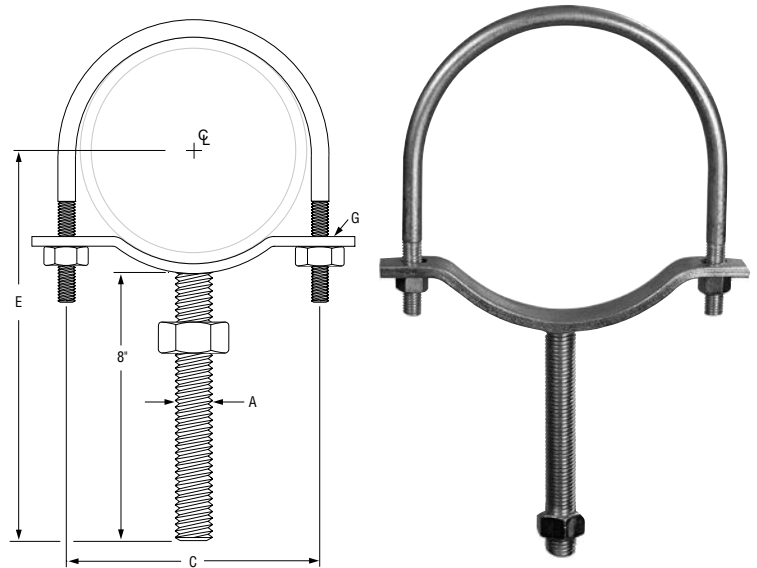


Fig. 192

Adjustable Pipe Saddle

Size Range: 2" through 12"

Material: Carbon steel

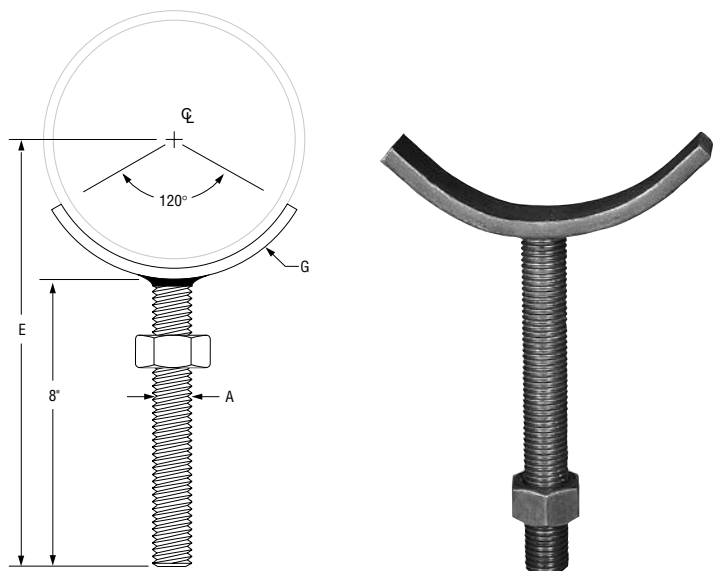
Finish: Plain or Zinc Plated (Hot-Dip Galvanized optional)

Service: Stanchion type support for **stationary** pipe where vertical adjustment is required.

Approvals: Complies with Federal Specification A-A-1192A (Type 38), ANSI/MSS SP-69 and MSS SP-58 (Type 38).

Ordering: Specify pipe size to be supported, figure number, name and finish.

| FIG. 192: DIMENSIONS (IN) • WEIGHTS (LBS) | | | | |
|---|------------|----------------------------------|-------------|--------|
| Pipe Size | Rod Size A | E | G | Weight |
| 2 | 5/8 | 9 ⁷ / ₁₆ | 1/4 x 1 | 1.0 |
| 2 1/2 | | 9 ¹ / ₁₆ | | 1.4 |
| 3 | | 10 | | 1.6 |
| 3 1/2 | | 10 ¹ / ₄ | | 2.6 |
| 4 | 7/8 | 10 ¹ / ₂ | 1/4 x 1 1/4 | 3.0 |
| 5 | | 11 | | 3.2 |
| 6 | 1 | 11 ¹¹ / ₁₆ | 3/8 x 1 1/2 | 4.9 |
| 8 | | 12 ¹¹ / ₁₆ | | 6.2 |
| 10 | 1 1/4 | 13 ³ / ₈ | 1/2 x 2 | 10.5 |
| 12 | | 14 ⁷ / ₈ | | 11.8 |



STANCHIONS & SUPPORTS

Fig. 220: Standard Pipe Stays

Fig. 221: Double Pipe Stays

Fig. 223: Extended Pipe Stays

Pipe Stays

Size Range: Fig. 220: 1/2" C x 3/8" IP through 2" C

Fig. 221: 1/2" C x 3/8" IP through 3/4" C x 1/2" IP

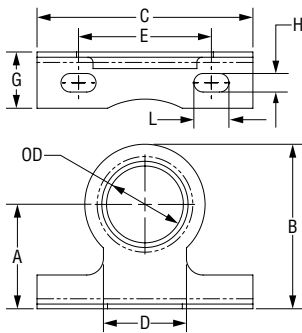
Fig. 223: 1/2" C x 3/8" IP through 1 1/4" C x 1" IP

Material: Carbon Steel

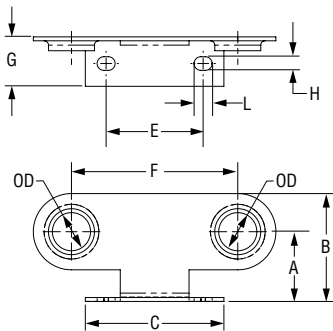
Finish: Epoxy Coated

Service: Provides a vertical or horizontal offset guide for Copper Tube and Iron Pipe in plumbing and heating applications.

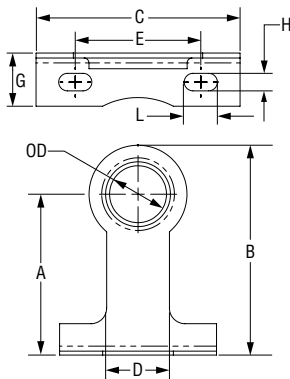
Ordering: Specify pipe size, figure number, name and finish.



| FIG. 220: DIMENSIONS (IN) • WEIGHT (LBS) | | | | | | | | | | |
|--|------|------|------|------|------|-------|------|-------|-------|--------|
| Size | A | B | C | D | E | OD | G | H | L | Weight |
| 1/2 C x 3/8 IP | 1.13 | 1.61 | 2.50 | 1.00 | 1.75 | 0.687 | 0.77 | 0.220 | 0.484 | 0.07 |
| 3/4 C x 1/2 IP | 1.19 | 1.67 | 2.50 | 1.00 | 1.75 | 0.906 | 0.77 | 0.220 | 0.484 | 0.08 |
| 1 C x 3/4 IP | 1.50 | 2.03 | 3.25 | 1.25 | 2.00 | 1.156 | 0.77 | 0.280 | 0.528 | 0.12 |
| 1 1/4 C x 1 IP | 1.50 | 2.03 | 3.25 | 1.25 | 2.00 | 1.406 | 0.77 | 0.280 | 0.528 | 0.12 |
| 1 1/2 C x 1 1/4 IP | 2.50 | 3.03 | 4.00 | 1.75 | 3.00 | 1.719 | 0.95 | 0.303 | 0.528 | 0.22 |
| 1 1/2 IP | 2.63 | 3.15 | 4.50 | 2.19 | 3.25 | 1.969 | 0.95 | 0.303 | 0.528 | 0.25 |
| 2 IP | 2.69 | 3.22 | 4.50 | 2.19 | 3.25 | 2.437 | 0.95 | 0.303 | 0.528 | 0.26 |
| 2 C | 2.69 | 3.22 | 4.50 | 2.19 | 3.25 | 2.187 | 0.95 | 0.303 | 0.528 | 0.25 |



| FIG. 221: DIMENSIONS (IN) • WEIGHT (LBS) | | | | | | | | | | |
|--|------|------|------|------|------|-------|------|-------|-------|--------|
| Size | A | B | C | E | F | OD | G | H | L | Weight |
| 1/2 C x 3/8 IP | 2.50 | 2.83 | 2.50 | 1.75 | 3.00 | 0.687 | 0.82 | 0.246 | 0.325 | 0.16 |
| 3/4 C x 1/2 IP | 2.50 | 2.83 | 2.50 | 1.75 | 3.00 | 0.906 | 0.82 | 0.246 | 0.325 | 0.15 |



| FIG. 223: DIMENSIONS (IN) • WEIGHT (LBS) | | | | | | | | | | |
|--|------|------|------|------|------|-------|------|-------|-------|--------|
| Size | A | B | C | D | E | OD | G | H | L | Weight |
| 1/2 C x 3/8 IP | 2.50 | 2.98 | 2.50 | 1.00 | 1.75 | 0.687 | 0.77 | 0.220 | 0.484 | 0.10 |
| 3/4 C x 1/2 IP | 2.50 | 2.98 | 2.50 | 1.00 | 1.75 | 0.906 | 0.77 | 0.220 | 0.484 | 0.10 |
| 1 C x 3/4 IP | 2.69 | 3.22 | 3.25 | 1.25 | 2.00 | 1.156 | 0.77 | 0.280 | 0.528 | 0.15 |
| 1 1/4 C x 1 IP | 2.69 | 3.22 | 3.25 | 1.25 | 2.00 | 1.406 | 0.77 | 0.280 | 0.528 | 0.17 |

Fig. 258

Pipe Saddle Support

Size Range: 4" through 36"

Material: Sizes 4" through 12" are Cast Iron. Sizes 14" through 36" are Carbon Steel. Sizes 4" through 12" are available in Carbon Steel by special request only.

Finish: Plain or Zinc Plated (Hot-Dip Galvanized optional)

Service: Stanchion type support for **stationary** pipe.

Approvals: Complies with Federal Specification A-A-1192A (Type 36), WW-H-171-E (Type 36 & 37), ANSI/MSS SP-69 and MSS SP-58 (Type 36).

Installation: Slip saddle base into riser pipe.

Ordering: Specify size to be supported, figure number, name, finish and material.

Order Separately: Figure 63P Square Cut End Stanchion. Specify "H" and pipe size to be supported by Figure 258.



Fig. 258 Cast

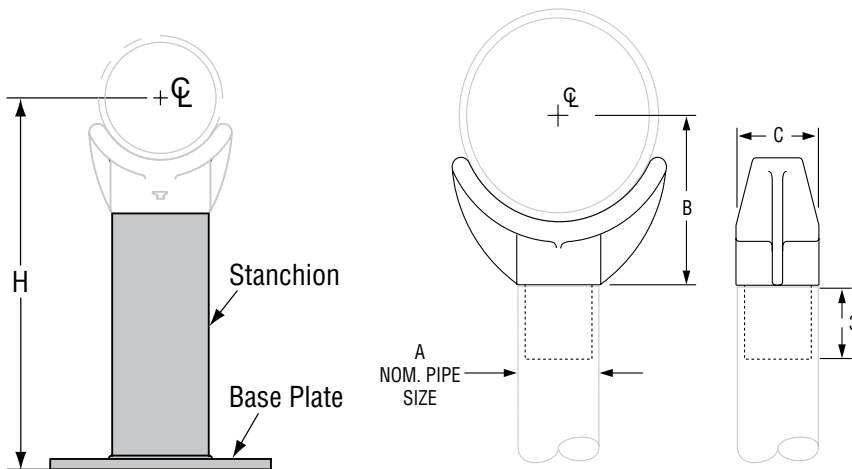


Fig. 63, Type P

Square Cut End for use with Figure 258 or 259 Pipe Saddle Support



Fig. 258 Fabricated Steel

FIG. 258: DIMENSIONS (IN) • WEIGHTS (LBS)

| Pipe Size | Weight | A | B | Width C | Max Load |
|-----------|--------|---|---------------------------------|-------------------------------|----------|
| 4 | 9.1 | 3 | 4 ³ / ₁₆ | 3 ⁵ / ₈ | 3,800 |
| 5 | 10.8 | | 4 ¹³ / ₁₆ | | |
| 6 | 11.8 | | 5 ⁷ / ₁₆ | | |
| 8 | 14.3 | | 6 ¹⁵ / ₁₆ | | |
| 10 | 19.3 | | 8 ⁷ / ₁₆ | | |
| 12 | 23.1 | | 9 ¹⁵ / ₁₆ | | |
| 14 | 15.0 | 4 | 10 ¹ / ₂ | 4 | 5,300 |
| 16 | 16.0 | | 11 ¹ / ₂ | | |
| 18 | 23.0 | | 13 ¹ / ₂ | 5 | 7,300 |
| 20 | 24.0 | | 14 ¹ / ₂ | | |
| 22 | 26.0 | | 15 ¹ / ₂ | | |
| 24 | 30.0 | | 17 ¹ / ₂ | | |
| 26 | 32.0 | | 18 ¹ / ₂ | | |
| 30 | 41.0 | | 20 ⁵ / ₈ | | |
| 32 | 42.0 | | 21 ⁵ / ₈ | 8 ³ / ₄ | |
| 36 | 46.0 | | 23 ⁵ / ₈ | | |

*Standard Wall Pipe The above load ratings are applicable to the saddle only and are not applicable to the stanchion or other means used to support the saddle.

Fig. 259

Pipe Saddle Support with U-Bolt

Size Range: 4" through 36" pipe

Material: Cast iron stanchion saddle with steel yoke and nuts. 14" through 36" carbon steel saddle with steel yoke. 4" through 12" steel saddle available on special request.

Finish: Plain or Zinc Plated (Hot-Dip Galvanized optional)

Service: Stanchion type support with additional stability provided by U-bolt attachment to pipe.

Approvals: Complies with Federal Specification A-A-1192A (Type 37), ANSI/MSS SP-69 and MSS SP-58 (Type 37).

Installation: Same as pipe saddle support Fig. 258, except that yoke is attached to saddle after pipe is in place.

Features: U-bolt yoke provides stability.

Ordering: Specify pipe size to be supported, figure number, name, material and finish.

Order Separately: Figure 63P Square Cut End Stanchion. Specify "H" and pipe size to be supported by Figure 259.



Fig. 259
Cast Iron



Fig. 259
Fabricated Steel

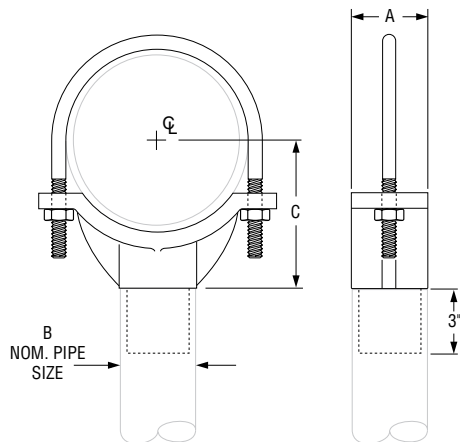


Fig. 259
Cast Iron

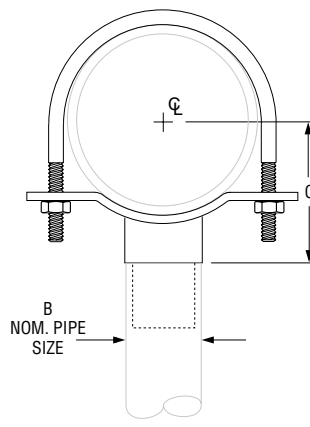


Fig. 259
Fabricated Steel

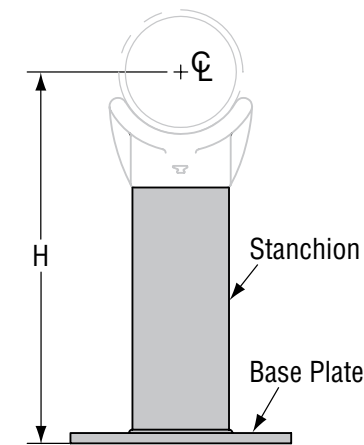


Fig. 63, Type P

Square Cut End for use with Figure 258 or 259 Pipe Saddle Support

FIG. 259: DIMENSIONS (IN) • WEIGHTS (LBS)

| Pipe Size | Weight | A | B Cast | B Fabricated | C Cast | C Fabricated | Max Load |
|-----------|--------|---|---------------------------------|---------------------------------|-------------------------------|--------------|----------|
| 4 | 10.8 | 3 | 4 ³ / ₁₆ | 3 ⁵ / ₈ | 3 ⁵ / ₈ | 4 | 3,800 |
| 5 | 12.1 | | 4 ¹³ / ₁₆ | 4 ¹ / ₈ | | | |
| 6 | 12.7 | | 5 ¹ / ₁₆ | 4 ¹¹ / ₁₆ | | | |
| 8 | 21.3 | | 6 ¹⁵ / ₁₆ | 6 ¹¹ / ₁₆ | | | |
| 10 | 25.7 | | 8 ⁷ / ₁₆ | 7 ³ / ₄ | | | |
| 12 | 31.2 | | 9 ¹⁵ / ₁₆ | 8 ³ / ₄ | | | |
| 14 | 28.0 | 4 | - | 10 ¹ / ₂ | - | 6 | 5,300 |
| 16 | 31.0 | | | 11 ¹ / ₂ | | | |
| 18 | 40.0 | | | 13 ¹ / ₂ | | | 6,700 |
| 20 | 43.0 | | | 14 ¹ / ₂ | | | |
| 22 | 46.0 | | | 15 ¹ / ₂ | | | 7,300 |
| 24 | 52.0 | | | 17 ¹ / ₂ | | | |
| 26 | 55.0 | | | 18 ¹ / ₂ | | | |
| 30 | 69.0 | | | 20 ⁵ / ₈ | | | |
| 32 | 73.0 | | | 21 ¹ / ₄ | | | |
| 36 | 81.0 | | | 23 ⁵ / ₈ | | | |

* Standard Wall Pipe

The above load ratings are applicable to the saddle only and are not applicable to the stanchion or other means used to support the saddle.

Fig. 264 (Formerly Afcon Fig. 707)

Adjustable Pipe Saddle Support

Size Range: 2 1/2" through 36"

Material: Cast iron saddle, locknut nipple and special cast iron reducer, assembled.

Finish: Plain or Zinc Plated (Nipple Reducer Assembly cannot be Hot-Dipped.)

Service: Stanchion type support where vertical adjustment of **stationary** pipe is required.

Approvals: Complies with Federal Specification A-A-1192A (Type 38), WW-H-171-E (Type 39), ANSI/MSS SP-69 and MSS SP-58 (Type 38).

Installation: Adjustment is obtained by turning the locknut nipple. The lower end of the nipple is staked, upsetting the threads to prevent separation of nipple and coupling during adjustment.

Features:

- Vertical adjustment of approximately 4 1/2"
- Saddle supports a broad range of pipe sizes

Ordering: Specify pipe size to be supported, figure number, name and finish.

Order Separately: Figure 63T Square Cut Threaded End Stanchion. Specify "H" and pipe size to be supported by Figure 264.

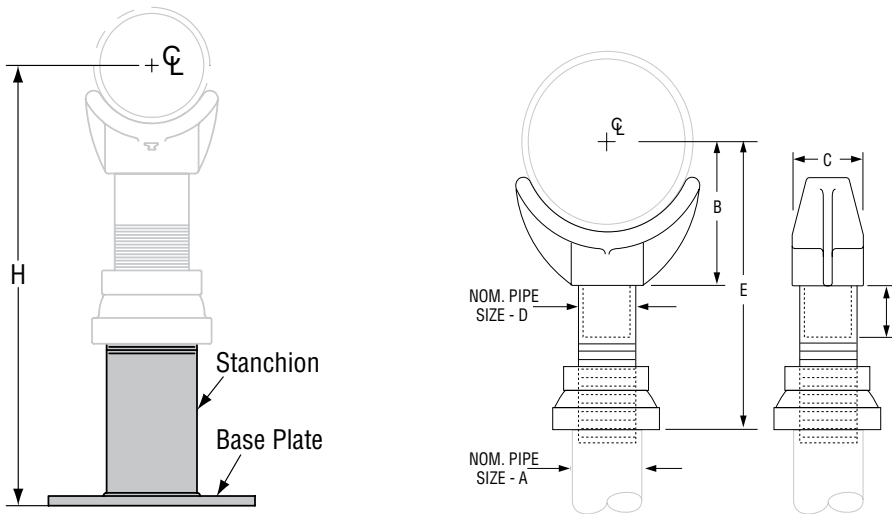


Fig. 63, Type T

Square Cut Threaded End for use with Figure 264 or 265 Adjustable Pipe Saddle Support

FIG. 264: DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS)

| Pipe Size | Weight | | A | B | D | E | | Width C | Max Load |
|-----------|----------|-------------|-------|----------|---------|---------|---------|---------|----------|
| | Complete | Saddle Only | | | | Min | Max | | |
| 2 1/2 | 9.0 | 4.8 | 2 1/2 | 3 1/2 | 1 1/2 | 8 | 13 | 3 | 1,800 |
| 3 | 9.2 | 5.0 | | 3 3/4 | | 8 1/4 | 13 1/4 | | |
| 3 1/2 | 9.4 | 5.2 | | 4 | | 8 1/2 | 13 1/2 | | |
| 4 | 15.0 | 7.6 | 3 | 4 1/4 | 2 1/2 | 9 1/4 | 14 | 3 5/8 | 3,800 |
| 5 | 16.7 | 8.3 | | 4 7/8 | | 10 | 14 3/4 | | |
| 6 | 17.7 | 10.3 | | 5 1/2 | | 10 1/2 | 15 1/4 | | |
| 8 | 20.2 | 12.8 | | 6 7/8 | | 11 3/4 | 16 1/2 | | |
| 10 | 25.2 | 17.8 | | 8 1/2 | | 13 1/2 | 18 1/4 | | |
| 12 | 29.0 | 21.6 | | 9 15/16 | | 15 | 19 3/4 | | |
| 14 | 40.2 | 38.0 | 4 | 10 5/16 | 3 | 16 1/4 | 20 3/4 | 4 5/8 | 5,300 |
| 16 | 53.2 | 42.0 | | 12 3/8 | | 17 3/4 | 22 1/4 | | |
| 18 | 70.8 | 51.0 | 6 | 13 7/8 | 3 1/2 | 19 1/2 | 24 | 6 3/4 | 6,700 |
| 20 | 104.8 | 85.0 | | 15 5/8 | | 21 | 25 1/2 | | |
| 22 | 121.0 | 98.0 | | 15 1/2 | | 21 5/16 | 25 3/16 | | |
| 24 | 137.0 | 110.0 | | 17 15/16 | 23 3/4 | 28 1/4 | | | |
| 26 | 154.0 | 130.0 | | 18 1/2 | 24 5/16 | 28 3/16 | | | |
| 30 | 170.0 | 150.0 | | 21 15/16 | 27 | 31 1/2 | | | |
| 32 | 181.0 | 161.1 | 6 | 22 1/2 | 4 | 28 1/4 | 32 3/4 | 8 3/4 | 7,300 |
| 36 | 249.0 | 229.0 | | 24 1/2 | | 30 1/4 | 34 3/4 | | |

* The special cast iron reducer may be furnished with a hexed shaped smaller end.

* Standard Wall Pipe

The above load ratings are applicable to the saddle only and are not applicable to the stanchion or other means used to support the saddle.

STANCHIONS & SUPPORTS

Fig. 265 (Formerly Afcon Fig. 708) Adjustable Pipe Saddle Support with U-Bolt

Size Range: 4" through 36"

Material: Cast iron saddle, steel yoke and nuts, steel locknut nipple and special cast iron reducer. (14" through 36" carbon steel saddle with steel yoke. 4" through 12" steel saddle available upon special request)

Finish: Plain or Zinc Plated (Hot-Dip Fasteners not available. Nipple Reducer Assembly cannot be Hot-Dipped.)

Service: Stanchion type support where vertical adjustment is required, plus the additional stability provided by U-bolt attachment to pipe.

Approvals: Complies with Federal Specification A-A-1192A (Type 38), WW-H-171-E (Type 39), ANSI/MSS SP-69 and MSS SP-58 (Type 38).

Installation: Adjustment is obtained by turning the locknut nipple. The lower end of the nipple is staked, upsetting the threads to prevent separation of nipple and coupling during adjustment.

Features:

- Vertical adjustment of approximately 4 1/2"
- Saddle supports a broad range of pipe sizes

Ordering: Specify pipe size to be supported, figure number, name and finish.

Order Separately: Figure 63T Square Cut Threaded End Stanchion. Specify "H" and pipe size to be supported by Figure 265.

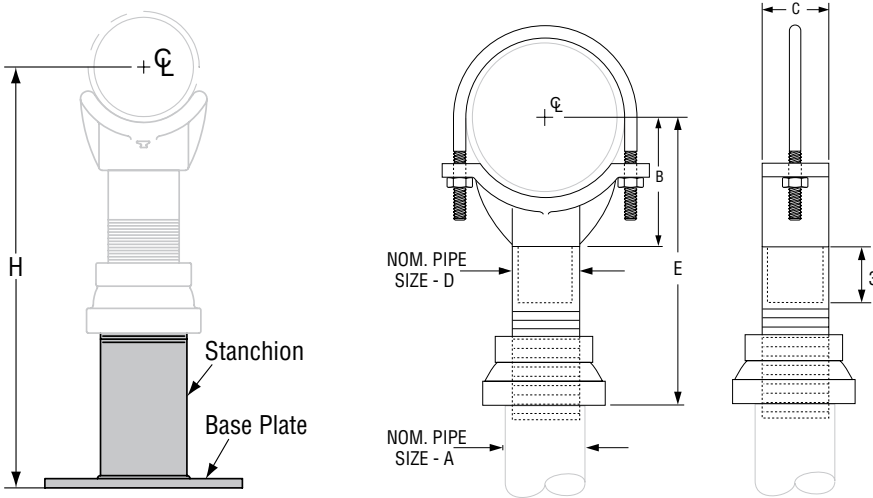


Fig. 63, Type T

Square Cut Threaded End for use with Figure 264 or 265 Adjustable Pipe Saddle Support

FIG. 265: DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS)

| Pipe Size | Weight | | A | B | D | E | | Width C | Max Load |
|-----------|----------|-------------|---|---------------------------------|---|----------------------------------|----------------------------------|-------------------------------|----------|
| | Complete | Saddle Only | | | | Min | Max | | |
| 4 | 22.0 | 10.8 | 4 | 4 ³ / ₁₆ | 3 | 9 ¹ / ₂ | 14 | 3 ⁵ / ₈ | 3,800 |
| 5 | 23.1 | 12.1 | | 4 ¹³ / ₁₆ | | 10 ¹ / ₈ | 14 ⁵ / ₈ | | |
| 6 | 23.9 | 12.7 | | 5 ⁷ / ₁₆ | | 10 ³ / ₄ | 15 ¹ / ₄ | | |
| 8 | 32.5 | 21.3 | | 6 ¹⁵ / ₁₆ | | 12 ¹ / ₄ | 16 ³ / ₄ | | |
| 10 | 36.9 | 25.7 | | 8 ⁷ / ₁₆ | | 13 ³ / ₄ | 18 ¹ / ₄ | | |
| 12 | 42.4 | 31.2 | | 9 ¹⁵ / ₁₆ | | 14 ⁵ / ₈ | 19 ¹ / ₈ | | |
| 14 | 39.2 | 28.0 | 6 | 10 ¹ / ₂ | 4 | 15 ¹³ / ₁₆ | 20 ⁵ / ₁₆ | 6 | 5,300 |
| 16 | 42.2 | 31.0 | | 11 ¹ / ₂ | | 16 ¹³ / ₁₆ | 21 ⁵ / ₁₆ | | |
| 18 | 60.0 | 40.0 | | 13 ¹ / ₂ | | 19 ¹ / ₈ | 23 ³ / ₈ | | |
| 20 | 63.0 | 43.0 | | 14 ¹ / ₂ | | 20 ¹ / ₈ | 24 ⁵ / ₈ | | |
| 22 | 66.0 | 46.0 | | 15 ¹ / ₂ | | 21 ⁵ / ₁₆ | 25 ³ / ₁₆ | | |
| 24 | 72.0 | 52.0 | | 17 ¹ / ₂ | | 23 ³ / ₁₆ | 27 ¹³ / ₁₆ | | |
| 26 | 75.0 | 57.0 | | 18 ¹ / ₂ | | 24 ⁷ / ₁₆ | 28 ¹³ / ₁₆ | | |
| 30 | 89.0 | 69.0 | | 20 ⁵ / ₈ | | 26 ¹ / ₁₆ | 30 ¹⁵ / ₁₆ | | |
| 32 | 93.0 | 73.0 | | 21 ¹ / ₈ | | 27 ¹ / ₁₆ | 31 ¹⁵ / ₁₆ | | |
| 36 | 101.0 | 81.0 | | 23 ³ / ₈ | | 29 ¹ / ₁₆ | 33 ¹⁵ / ₁₆ | | |

* The special cast iron reducer may be furnished with a hexed shaped smaller end.

* Standard Wall Pipe

The above load ratings are applicable to the saddle only and are not applicable to the stanchion or other means used to support the saddle.

Fig. 212

Medium Pipe Clamp

Size Range: 2" through 30"

Material: Carbon steel

Finish: Plain or Hot-Dip Galvanized with Zinc Plated Bolts & Nuts

Maximum Temperature: Plain 750° F, Galvanized 450° F

Service: Pipe clamp for figure numbers 257, 436, and 439 slides and tees.

Ordering: Specify pipe size, figure number, name and finish.

Note: Two clamps are required. "T" section 257/436 is notched to accommodate clamps and to eliminate the increase in height of the slide assembly.

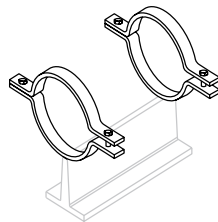
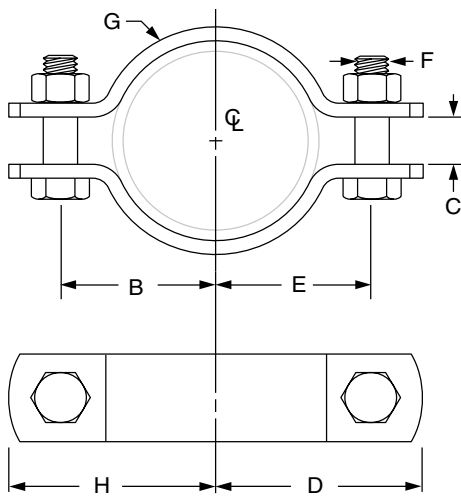


Fig. 257
w/ Fig 212 Clamps

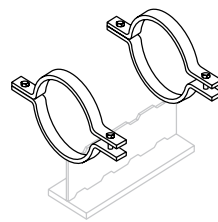


Fig. 436
w/ Fig 212 Clamps

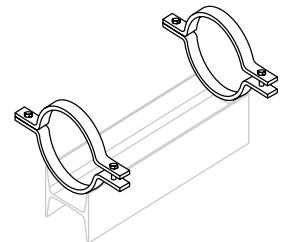


Fig. 439
w/ Fig 212 Clamps

FIG. 212: DIMENSIONS (IN) • WEIGHT (LBS)

| Pipe Size | B | C | D | E | H | F | G Width | Weight |
|-------------------------------|--------------------------------|--------------------------------|---------------------------------|--------------------------------|---------------------------------|--------------------------------|-------------------------------|--------|
| 2 | 2 ¹ / ₈ | 1/2 | 2 ³ / ₄ | 2 ¹ / ₈ | 2 ³ / ₄ | 1/2 | 1 | 2.2 |
| 2 ¹ / ₂ | 2 ⁵ / ₈ | 5/8 | 3 ¹ / ₄ | 2 ⁵ / ₈ | 3 ¹ / ₄ | | | 2.4 |
| 3 | 2 ⁷ / ₈ | | 3 ¹ / ₂ | 2 ⁷ / ₈ | 3 ¹ / ₂ | | | 2.8 |
| 3 ¹ / ₂ | 3 ³ / ₁₆ | | 3 ¹³ / ₁₆ | 3 ³ / ₁₆ | 3 ¹³ / ₁₆ | | | 3.0 |
| 4 | 3 ¹ / ₂ | 3/4 | 4 ¹ / ₄ | 3 ¹ / ₂ | 4 ¹ / ₄ | 5/8 | 1 ¹ / ₄ | 4.6 |
| 5 | 4 ³ / ₁₆ | | 4 ¹⁵ / ₁₆ | 4 ³ / ₁₆ | 4 ¹⁵ / ₁₆ | | | 5.2 |
| 6 | 4 ⁷ / ₈ | 1 ¹ / ₄ | 5 ³ / ₄ | 4 ⁷ / ₈ | 5 ³ / ₄ | 3/4 | 1 ¹ / ₂ | 10.8 |
| 8 | 6 | | 6 ⁷ / ₈ | 6 | 6 ⁷ / ₈ | | | 13.0 |
| 10 | 7 ⁷ / ₁₆ | | 1 | 8 ⁹ / ₁₆ | 7 ⁷ / ₁₆ | 8 ⁹ / ₁₆ | 7/8 | 2 |
| 12 | 8 ⁷ / ₁₆ | 9 ⁹ / ₁₆ | | 8 ⁷ / ₁₆ | 9 ⁹ / ₁₆ | 30.4 | | |
| 14 | 9 ¹ / ₄ | 10 ⁵ / ₈ | | 9 ¹ / ₄ | 10 ⁵ / ₈ | 2 ¹ / ₂ | | |
| 16 | 10 ¹ / ₄ | 11 ⁵ / ₈ | 10 ¹ / ₄ | 11 ⁵ / ₈ | 44.6 | | | |
| 18 | 11 ⁵ / ₈ | 1 ¹ / ₄ | 13 | 11 ⁵ / ₈ | 13 | 1 | 3 | 63.2 |
| 20 | 12 ³ / ₄ | 1 ³ / ₈ | 14 ¹ / ₈ | 12 ³ / ₄ | 14 ¹ / ₈ | | | 71.6 |
| 24 | 15 ¹ / ₄ | 1 ⁵ / ₈ | 16 ⁷ / ₈ | 15 ¹ / ₄ | 16 ⁷ / ₈ | 1 ¹ / ₄ | 4 | 106.2 |
| 30 | 19 | 2 | 21 ¹ / ₈ | 19 | 21 ¹ / ₈ | | | 227.8 |

•Clamps may be furnished with square ends.

Fig. 255

Pipe Alignment Guide

Size Range: 1" through 24" pipe and insulation thickness of 1" through 4"

(Also available in copper tube sizes, see page 144)

Material: Carbon steel

Finish: Plain or Hot-Dip Galvanized with Zinc Plated Bolts & Nuts

Service: For maintaining alignment of piping through its axial expansion and contraction cycles. Normally, two or more pipe alignment guides are used on a single piping run to avoid a pivoting effect within the piping system. It is recommended that the first guide be located a maximum of four pipe diameters from an expansion joint.

The second guide should be placed a maximum of 18 pipe diameters from an expansion joint. Additional guides should be employed in accordance with the guide spacing data shown on next page. Supports are usually required between the intermediate guides to comply with standard support practice.

Maximum Temperature: 650° F

Installation:

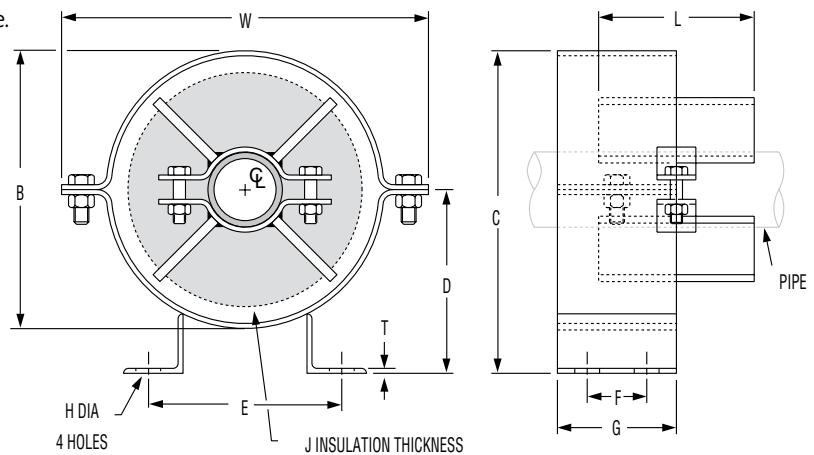
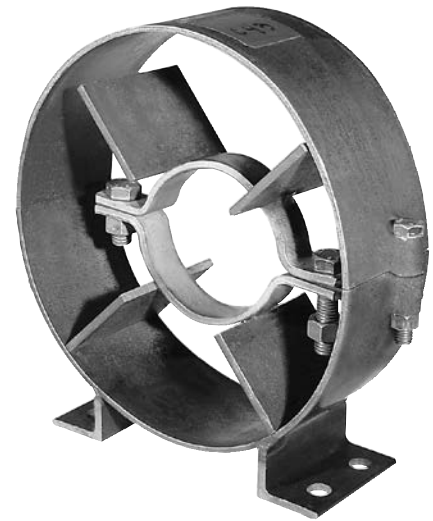
- (1) Attach outer housing to structure by bolting or welding.
- (2) Remove upper section of housing to open position.
- (3) Attach spider clamp to pipe and completely insulate.
- (4) Set pipe and spider clamp into outer housing.
- (5) Replace upper section of housing to closed position and secure.

Note: Spider attachments to pipe must be properly located during installation to insure that a minimum of one-half the spider width remains within the length of the outer housing for all conditions of operation. See table on opposite page for maximum recommended travels. If larger travels are required, special guides can be furnished to special order.

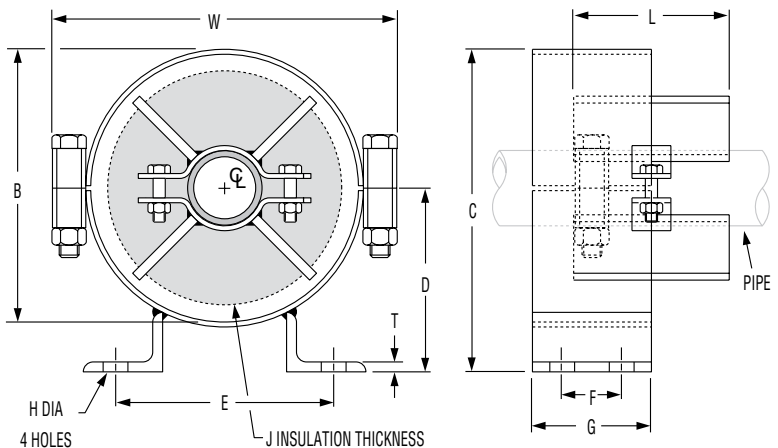
How to size: Size by nominal pipe size and insulation thickness in accordance with the selection table on the opposite page.

Ordering: Specify size number, pipe size, insulation, thickness, figure number, name and finish.

Caution: The primary function of the Figure 255 is to maintain axial alignment of a system. Other components should be incorporated into the system to carry the primary loading of the system. Guides are designed such that minor loading amounts may be transferred to the guide in any given direction, up to 20% of dead weight load for typical maximum spans of a given pipe diameter.



Pipe Alignment Guide
Figure 255, Size A & B



Pipe Alignment Guide
Figure 255, Size C thru J

| Pipe Size (in) | L (in) | Maximum Movement |
|----------------|--------|------------------|
| 1" to 6" | 4 | 4 |
| 8" to 16" | 6 | 6 |
| 18" to 24" | 8 | 8 |

Dimensional Data on Following Page.

Fig. 255

Pipe Alignment Guide (cont.)

| GUIDE SIZE NUMBER | | | | | | |
|-------------------|---------------------------|----|---|----|---|---|
| Pipe Size | Insulation Thickness (in) | | | | | |
| | 1 | 1½ | 2 | 2½ | 3 | 4 |
| 1 | | | | | | |
| 1¼ | A | A | A | B | B | C |
| 1½ | | | | | | |
| 2 | B | B | B | C | D | E |
| 2½ | | | | | | |
| 3 | | | | | | |
| 3½ | | | | C | | D |
| 4 | C | C | C | D | D | E |
| 5 | | | | | | |
| 6 | D | D | D | E | | F |
| 8 | – | E | E | E | | |
| 10 | – | F | F | F | F | G |
| 12 | – | | | | | |
| 14 | – | – | G | G | G | H |
| 16 | – | – | | | | |
| 18 | – | – | – | – | H | H |
| 20 | – | – | – | – | | |
| 24 | – | – | – | – | J | J |

| GUIDE SIZE SELECTION TABLE | | | | | | | | | |
|--|----------------------------------|--------------------------------|----------------------------------|---------------------------------|--------------------------------|----|---|-------------------------------|---|
| Locate bare nominal pipe size in appropriate insulation thickness column and read guide size from "Guide Size No." column to the left. | | | | | | | | | |
| Guide Size No. | Dimensions (in) | | | | | | | | |
| | W | B | C | D | E | F | G | H | T |
| A | 8 ¹³ / ₁₆ | 6¾ | 8 ⁷ / ₈ | 4 ⁵ / ₁₆ | 6¾ | 2½ | 4 | 5 ⁵ / ₈ | ¼ |
| B | 10 ¹³ / ₁₆ | 8¾ | 9 ⁷ / ₈ | 5 ⁵ / ₁₆ | 7 ³ / ₈ | | | | |
| C | 13 ³ / ₁₆ | 11¼ | 12 ⁷ / ₁₆ | 6 ⁵ / ₈ | 7 ⁷ / ₈ | | | | |
| D | 15 ⁷ / ₈ | 13 ³ / ₈ | 14 ¹³ / ₁₆ | 7 ¹⁵ / ₁₆ | 9¾ | 4 | 6 | ¾ | ¾ |
| E | 18 | 15½ | 17 ¹ / ₁₆ | 9 ⁵ / ₈ | | | | | |
| F | 22¼ | 19¾ | 21 ¹ / ₁₆ | 11 | 14 ¹ / ₈ | 5½ | 8 | 1 | ¾ |
| G | 28 | 25 | 26¼ | 13 ³ / ₁₆ | 15 ⁷ / ₈ | | | | |
| H | 32 ³ / ₈ | 29¼ | 30¾ | 15 ⁷ / ₈ | 16 ³ / ₈ | | | | |
| J | 37 ⁵ / ₈ | 34½ | 36 ⁵ / ₈ | 18 ⁵ / ₈ | 17 ⁷ / ₈ | | | | |

| Pipe Size* (in) | Maximum Distance (feet) Between Intermediate Guides for Pressure (psig) | | | | | | | | | |
|-----------------|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 500 | 600 |
| 3 | 38 | 27 | 22 | 20 | 18 | 17 | 15 | 14 | 13 | 12 |
| 4 | 52 | 37 | 32 | 27 | 25 | 23 | 22 | 19 | 17 | 16 |
| 6 | 66 | 47 | 40 | 35 | 31 | 28 | 27 | 25 | 23 | 20 |
| 8 | 85 | 62 | 51 | 45 | 40 | 36 | 35 | 32 | 29 | 27 |
| 10 | 103 | 75 | 62 | 54 | 50 | 45 | 42 | 40 | 35 | 32 |
| 12 | 118 | 85 | 70 | 60 | 55 | 50 | 46 | 43 | 40 | 35 |
| 14 | 120 | 87 | 72 | 62 | 57 | 52 | 48 | 45 | 41 | 37 |
| 16 | 130 | 95 | 78 | 68 | 61 | 57 | 52 | 49 | 45 | 41 |
| 18 | 145 | 105 | 87 | 75 | 68 | 62 | 58 | 55 | 50 | 45 |
| 20 | 155 | 110 | 92 | 90 | 73 | 68 | 62 | 58 | 53 | 49 |
| 24 | 180 | 128 | 105 | 90 | 83 | 75 | 70 | 65 | 60 | 54 |

* For pipe sizes not shown refer to the Expansion Joint Manufacturers Association Guidelines

Fig. CT-255

Copper Tubing Alignment Guide

Size Range: 1" through 4"

Material: Carbon steel

Finish: Plain or Hot-Dip Galvanized Housing with Zinc Plated Bolts and Nuts.

(Hot-Dip Galvanized optional) Copper Plated Finish on Spider Clamp.

Service: For maintaining alignment of tubing through its axial expansion and contraction cycles. Normally, two or more pipe alignment guides are used on a single tubing run to avoid a pivoting effect within the tubing system. Consult the Expansion Joint Manufacturers Association or the Copper Tube Manufacturers for additional guidelines of spacing requirements of intermediate guides. Supports are usually required between intermediate guides to comply with standard support practices.

Maximum Temperature: 400° F

Installation:

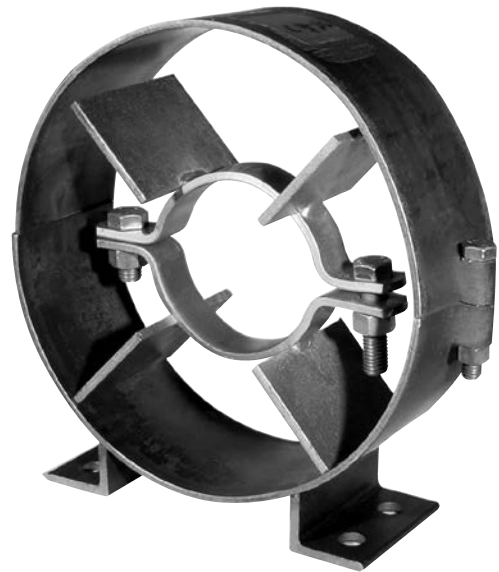
- (1) Attach outer housing to structure by bolting or welding.
- (2) Remove upper section of housing to open position.
- (3) Attach spider clamp to tube and completely insulate.
- (4) Set tube and spider clamp into outer housing.
- (5) Replace upper section of housing to closed position and secure.

Note: Spider attachments to tube must be properly located during installation to insure that a minimum of one-half the spider width remains within the length of the outer housing for all conditions of operation. If larger travels are required, special guides can be furnished to special order.

How to size: Size by nominal tube size and insulation thickness in accordance with the selection table.

Ordering: Specify size number, tube size, insulation thickness, figure number, name and finish.

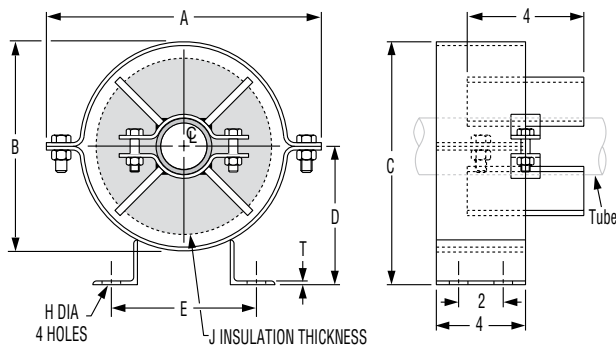
Caution: The primary function of the Figure CT-255 is to maintain axial alignment of a system. Other components should be incorporated into the system to carry the primary loading of the system. Guides are designed such that minor loading amounts may be transferred to the guide in any given direction, up to 20% of dead weight load for typical maximum spans of a given pipe diameter.



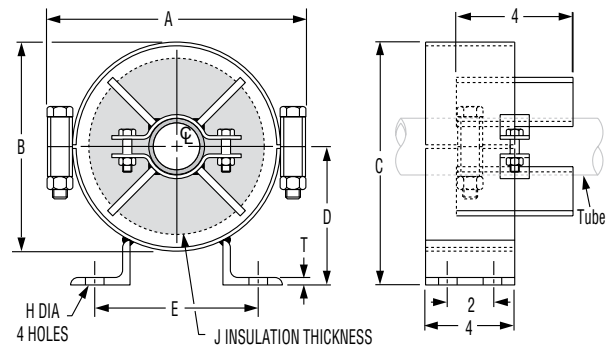
| Tube Size (in) | L (in) | Maximum Movement |
|----------------|--------|------------------|
| 1" to 4" | 4 | 4 |

Fig. CT-255

Copper Tubing Alignment Guide (cont.)



Copper Tubing Alignment Guide, Figure CT-255, Size A & B



Copper Tubing Alignment Guide, Figure CT-255, Size C thru D

| Guide Size No. | Dimensions (in) | | | | | | |
|----------------|----------------------------------|--------------------------------|----------------------------------|---------------------------------|-------------------------------|-------------------------------|-------------------------------|
| | A | B | C | D | E | H | T |
| A | 8 ¹³ / ₁₆ | 6 ³ / ₄ | 8 | 4 ⁵ / ₈ | 5 ³ / ₄ | 5 ⁵ / ₈ | 1 ¹ / ₄ |
| B | 10 ¹³ / ₁₆ | 8 ³ / ₄ | 10 | 5 ⁵ / ₈ | 7 | | |
| C | 13 ⁵ / ₁₆ | 11 ¹ / ₄ | 12 ⁷ / ₁₆ | 6 ⁵ / ₈ | 7 ³ / ₄ | | |
| D | 15 ⁵ / ₈ | 13 ³ / ₈ | 14 ¹³ / ₁₆ | 7 ¹⁵ / ₁₆ | 9 ³ / ₄ | 3 ³ / ₄ | 3 ⁵ / ₈ |

| Tube Size | Guide Size Number | | | | | |
|-------------------------------|---------------------------|-------------------------------|---|-------------------------------|---|---|
| | Insulation Thickness (in) | | | | | |
| | 1 | 1 ¹ / ₂ | 2 | 2 ¹ / ₂ | 3 | 4 |
| 1/2 | A | A | A | A | — | — |
| 3/4 | A | A | A | A | — | — |
| 1 | A | A | A | A | C | C |
| 1 ¹ / ₄ | A | A | A | C | C | C |
| 1 ¹ / ₂ | A | A | A | C | C | C |
| 2 | B | B | B | B | C | C |
| 2 ¹ / ₂ | B | B | B | B | C | C |
| 3 | B | B | B | B | D | D |
| 3 ¹ / ₂ | B | B | B | D | D | D |
| 4 | B | B | B | D | D | D |

Fig. 256

Size Range: 1" through 24" pipe and insulation thickness of 1" through 4"

Material: Carbon steel

Finish: Plain or Hot-Dip Galvanized with Zinc Plated Bolts & Nuts

Service: For maintaining alignment of piping through its axial expansion and contraction cycles. Normally, two or more pipe alignment guides are used on a single piping run to avoid a pivoting effect within the piping system. It is recommended that the first guide be located a maximum of four pipe diameters from an expansion joint. The second guide should be placed a maximum of 18 pipe diameters from the expansion joint. Additional guides should be employed in accordance with the guide spacing data on next page. Supports are usually required between the intermediate guides to comply with standard support practice.

Maximum Temperature: 750° F

Installation:

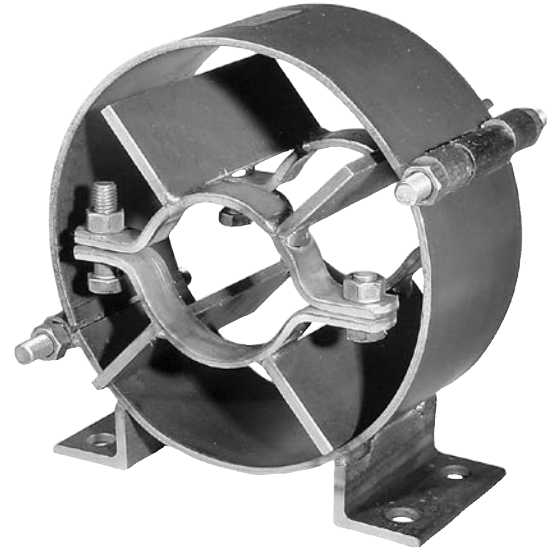
- (1) Attach outer housing to structure by bolting or welding.
- (2) Swing upper section of housing to open positions.
- (3) Attach spider clamp to pipe and completely insulate.
- (4) Set pipe and spider clamp into outer housing.
- (5) Replace upper section of housing to closed position and secure.

Note: Spider attachments to pipe must be properly located during installation to insure that a minimum of one-half the spider width remains within the length of the outer housing for all conditions of operation. See table on opposite page for maximum recommended travels. If larger travels are required, special guides can be furnished to special order.

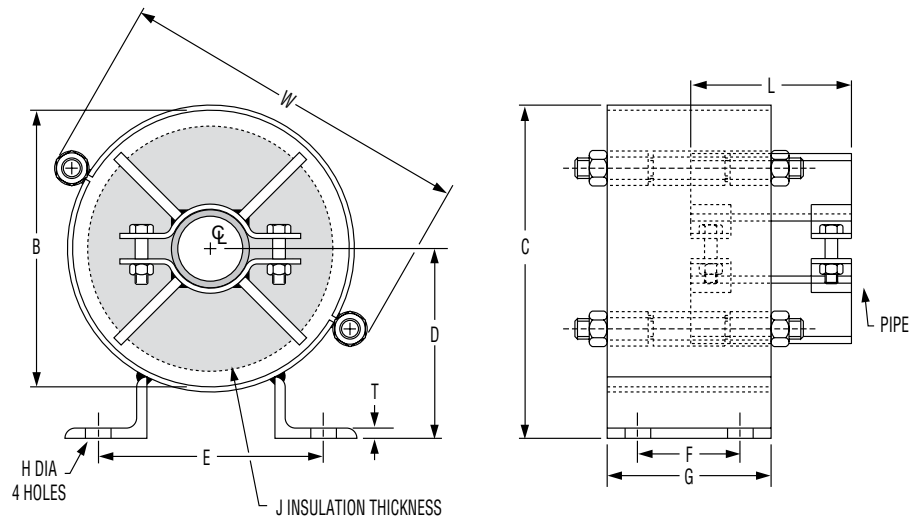
How to size: Size by nominal pipe size and insulation thickness in accordance with the selection table on opposite page.

Ordering: Specify size number, pipe size, insulation thickness, figure number, name and finish.

Caution: The primary function of the Figure 256 is to maintain axial alignment of a system. Other components should be incorporated into the system to carry the primary loading of the system. Guides are designed such that minor loading amounts may be transferred to the guide in any given direction, up to 20% of dead weight load for typical maximum spans of a given pipe diameter.



| Pipe Size (in) | L (in) | Maximum Movement |
|----------------|--------|------------------|
| 1" to 6" | 6 | 6 |
| 8" to 16" | 8 | 8 |
| 18" to 24" | 10 | 10 |



Dimensional Data on Following Page.

Fig. 256

Pipe Alignment Guide (cont.)

| GUIDE SIZE NUMBER | | | | | | |
|-------------------|---------------------------|----|---|----|---|---|
| Pipe Size | Insulation Thickness (in) | | | | | |
| | 1 | 1½ | 2 | 2½ | 3 | 4 |
| 1 | A | A | A | B | B | C |
| 1¼ | A | A | A | B | B | C |
| 1½ | A | A | A | B | B | C |
| 2 | B | B | B | B | C | C |
| 2½ | B | B | B | B | C | D |
| 3 | B | B | B | C | C | D |
| 3½ | B | B | B | C | C | D |
| 4 | C | C | C | C | C | D |
| 5 | C | C | C | D | D | E |
| 6 | D | D | D | D | E | E |
| 8 | – | E | E | E | E | F |
| 10 | – | F | F | F | F | F |
| 12 | – | F | F | F | F | G |
| 14 | – | – | G | G | G | G |
| 16 | – | – | G | G | G | G |
| 18 | – | – | – | – | H | H |
| 20 | – | – | – | – | H | H |
| 24 | – | – | – | – | J | J |

| GUIDE SIZE SELECTION TABLE | | | | | | | | | |
|--|----------------------------------|--------------------------------|----------------------------------|---------------------------------|--------------------------------|----|---|-------------------------------|---|
| Locate bare nominal pipe size in appropriate insulation thickness column and read guide size from "size no." column to the left. | | | | | | | | | |
| Guide Size No. | Dimensions (in) | | | | | | | | |
| | W | B | C | D | E | F | G | H | T |
| A | 8 ¹³ / ₁₆ | 6 ³ / ₄ | 7 ⁷ / ₈ | 4 ⁵ / ₁₆ | 6 ³ / ₄ | 2½ | 4 | 5 ⁵ / ₈ | ¼ |
| B | 10 ¹³ / ₁₆ | 8 ³ / ₄ | 9 ⁷ / ₈ | 5 ⁵ / ₁₆ | 7 ³ / ₈ | | | | |
| C | 13 ³ / ₄ | 11¼ | 12 ⁷ / ₁₆ | 6 ⁵ / ₈ | 7 ⁷ / ₈ | 4 | 6 | ¾ | ¾ |
| D | 15 ⁷ / ₈ | 13 ³ / ₈ | 14 ¹³ / ₁₆ | 7 ¹⁵ / ₁₆ | 9¼ | | | | |
| E | 18 | 15½ | 17 ¹ / ₁₆ | 9 ⁷ / ₈ | | | | | |
| F | 22¼ | 19¾ | 21 ¹ / ₁₆ | 11 | 14 ¹ / ₈ | 5½ | 8 | 1 | ¾ |
| G | 28 | 25 | 26¼ | 13 ³ / ₁₆ | 15 ⁷ / ₈ | | | | |
| H | 32 ³ / ₈ | 29¼ | 30¾ | 15 ⁷ / ₈ | 16 ³ / ₈ | | | | |
| J | 37 ⁵ / ₈ | 34½ | 36 ¹ / ₈ | 18 ⁵ / ₈ | 17 ⁷ / ₈ | | | | |

| RECOMMENDED EXPANSION JOINT GUIDE SPACING | | | | | | | | | | |
|---|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Pipe Size* (in) | Maximum Distance (feet) Between Intermediate Guides for Pressure (psig) | | | | | | | | | |
| | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 500 | 600 |
| 3 | 38 | 27 | 22 | 20 | 18 | 17 | 15 | 14 | 13 | 12 |
| 4 | 52 | 37 | 32 | 27 | 25 | 23 | 22 | 19 | 17 | 16 |
| 6 | 66 | 47 | 40 | 35 | 31 | 28 | 27 | 25 | 23 | 20 |
| 8 | 85 | 62 | 51 | 45 | 40 | 36 | 35 | 32 | 29 | 27 |
| 10 | 103 | 75 | 62 | 54 | 50 | 45 | 42 | 40 | 35 | 32 |
| 12 | 118 | 85 | 70 | 60 | 55 | 50 | 46 | 43 | 40 | 35 |
| 14 | 120 | 87 | 72 | 62 | 57 | 52 | 48 | 45 | 41 | 37 |
| 16 | 130 | 95 | 78 | 68 | 61 | 57 | 52 | 49 | 45 | 41 |
| 18 | 145 | 105 | 87 | 75 | 68 | 62 | 58 | 55 | 50 | 45 |
| 20 | 155 | 110 | 92 | 90 | 73 | 68 | 62 | 58 | 53 | 49 |
| 24 | 180 | 128 | 105 | 90 | 83 | 75 | 70 | 65 | 60 | 54 |

* For pipe sizes not shown refer to the Expansion Joint Manufacturers Association Guidelines

PTFE Pipe Slide Assemblies

Overview

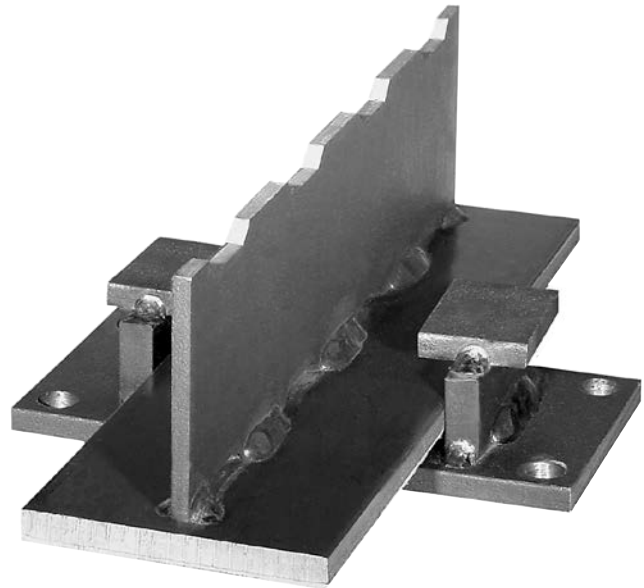
Application

Anvil PTFE pipe slide assemblies are designed to support the pipe and provide for lateral and axial movement due to thermal expansion and contraction of the piping system.

Assemblies are fabricated using PTFE slide bearings to provide a low coefficient of friction, minimizing frictional stress on the pipe and support structure.

Features

- Pre-engineered to save calculation and installation time.
- PTFE slide bearing pads are composed of 100% virgin Polytetrafluoroethylene polymer.
- Capable of supporting constant loads up to 2000 PSI at 70° F
- Coefficient of friction typically ranges between 0.06 and 0.2 depending on bearing surface area, bearing load (sample ranges shown in chart for given pressures at 70°F). Consult your Anvil representative for further information. The low coefficient of friction for the PTFE slide assemblies permits a smooth, unrestrained movement of the pipe and reduces overturning movements on supporting structures.
- PTFE is chemically inert and resists attack by chemicals, humidity and other elements found in harsh environments provided that the steel supports are suitably protected.
- Self-lubricating, maintenance-free.
- Provides resistance to galvanic corrosion between pipe and support structure.
- Maximum temperature: 400° F at PTFE
- Allows for up to 4" insulation thickness as standard. Greater than 4" insulation available on special request. Special designed slides and tees available on request.



Selection

- (1) Determine the support location based on allowable span and loading conditions.
- (2) Calculate the load for each slide assembly location.
- (3) Determine the lateral and axial movement of the pipe and the direction of movement, cold to hot.
- (4) Select pipe slide or tee figure number and attachment configuration, welded or bolted.
- (5) Select the method of slide plate attachment to support structure, welded or bolted.
- (6) Designate whether guided or non-guided slide plate is required.
- (7) Maximum recommended loads shown for pipe slides and structural tees are for vertical loading. Transitional loads for pipe structural tees are to be determined by customer.

Installation

- (1) Determine offset of pipe slide-slide plate interface to allow maximum pipe movement in direction of greatest thermal displacement.
- (2) Attach PTFE slide to pipe by welding or clamping with standard Fig. 212 pipe clamp or Fig. 432 special pipe clamp.
- (3) Attach slide plates to supporting structure by bolting or welding.
- (4) Verify setting to insure full bearing between the PTFE slide and slide base surfaces under all pipe movement conditions.

Note: PTFE surfaces should be protected from mechanical damage and contamination as well as from ultraviolet rays prior to installation.

PTFE Pipe Slide Assemblies

Overview (cont.)

The maximum load on the pipe slides is based on using a PTFE width of 2" for the slide plate and a 70° F temperature. For a different temperature at the bearing surfaces, multiply the maximum load rating by the following factor.

| Temperature °F | Factor |
|----------------|--------|
| 70 | 1.00 |
| 100 | 0.85 |
| 200 | 0.55 |
| 300 | 0.40 |
| 400 | 0.25 |

COEFFICIENT OF FRICTION VERSUS PRESSURE

Test Speed: 1"/min. (25mm/min.)

Temperature: 70°F (21°C)

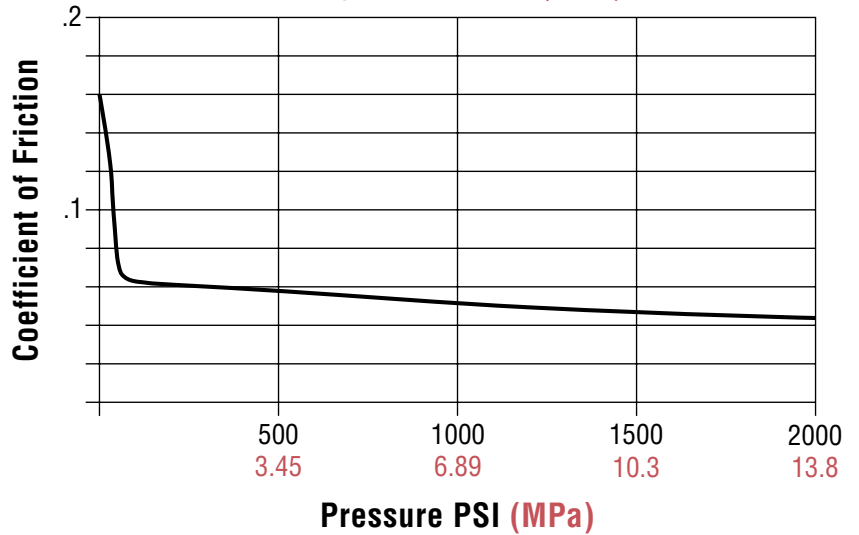


Fig. 257: Structural Tee Slide Assembly

Fig. 257A: Structural Tee

Fig. 436: Fabricated Tee Slide Assembly

Fig. 436A: Fabricated Tee

Pipe Slides Assembly, Complete

Size Range: All sizes within maximum load rating.

Material: Carbon steel tee, PTFE bonded slide plates and carbon steel base.

Finish: Plain, Painted or Hot-Dip Galvanized (Welded after Galvanizing and Cold Spray Touched-up)

Service: For the support of piping where horizontal movement resulting from expansion and contraction takes place and where a low coefficient of friction is desired.

Approvals: Complies with Federal Specification A-A-1192A (Type 35), ANSI/MSS SP-69 and MSS SP-58 (Type 35).

Maximum Load: As indicated at 70° F see page 149 for rating factor at higher temperatures.

Maximum Temperature: 750° F

Temperature Range at PTFE: -20° F to 400° F

Features:

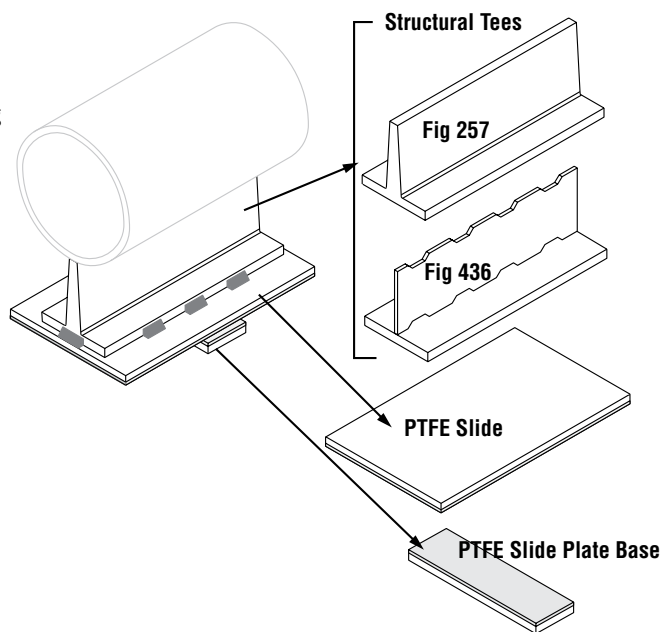
- No lubrication required.
- Designed to minimize heat loss.
- Allows up to 3" of insulation on Types 1, 2, 4 & 5 and up to 2 1/2" of insulation on Types 3 & 6.
- Allows up to 10" travel standard
- Weld in place design.

Available Options:

- Increased travels.
- Increased tee heights.
- End plates.
- Clamps, Fig. 212 or Fig. 432.
- Base plate with mounting holes
- High temperature option, 1000° F (Fig. 436) Stainless steel tee slide with an insulated PTFE slide

Ordering: Specify figure number, type, name, finish and any other option desired.

PTFE Pipe Slide Assembly – "T" Style (Type 1)



Note: In the PH-92 and PH-92R Catalogs:

The Fig. 257 & 436 (slide "T" section only) formerly referred to as Fig. 280 & 435

The Fig. 257 & 436 (slide base plate) formerly referred to as Fig. 438 (slide base plate)

The acceptability of galvanized coatings at temperatures above 450° F is at the discretion of the end user.

FIG. 257, 436: DIMENSIONS (IN) • LOADS (LBS) • WEIGHTS (LBS)

| Figure Number | Type | Max Load | | | Welded Slide | | | | Bolted Slide | | | | | | | |
|---------------|-------|---------------------------------|--------|----|---------------------------------|-----|---------------------------------|---------------------------------|---------------------------------|-------|---------------------------------|----------------|---------------------------------|--------|---------------|---------------|
| | | Down | Side * | Up | H ** | W | BL | Weight | H ** | W | BL | Hole Locations | Bolt Size | Weight | | |
| Fig. 257 | Tee | 8,000 | - | - | 3 ¹⁵ / ₁₆ | 4 | 12 | 7.00 | - | - | - | - | 1/2 | - | | |
| | 1 | | | | 4 ³ / ₄ | 4 | 2 | 11.93 | 4 ³ / ₄ | - | - | - | | 15.25 | | |
| | 2 | | | | 2,000 | 800 | 5 | 8 | 4 | 16.10 | 5 | 8 | | 4 | 2 1/2 x 6 1/2 | 16.10 |
| | 3 | | | | | | 16.95 | 5 | 8 | 4 | 18.36 | | | | | |
| | 4 | | | | - | - | 4 ³ / ₄ | 6 | 2 | 12.47 | 4 ³ / ₄ | 11 1/2 | | 5 | 3 1/2 x 10 | 19.21 |
| | 5 | | | | 2,000 | 800 | 5 | 11 1/2 | 5 | 18.81 | 5 | 11 1/2 | | 5 | 3 1/2 x 10 | 19.21 |
| 6 | 19.66 | 5 | 11 1/2 | 5 | | | 20.06 | | | | | | | | | |
| Fig. 436 | Tee | 8,000 | - | - | 4 | 4 | 12 | 7.00 | - | - | - | 1/2 | - | | | |
| | 1 | | | | 4 ¹¹ / ₁₆ | 4 | 2 | 15.42 | 4 ¹¹ / ₁₆ | - | - | | - | 18.74 | | |
| | 2 | | | | 2,000 | 800 | 4 ¹⁵ / ₁₆ | 8 | 4 | 19.59 | 4 ¹⁵ / ₁₆ | | 8 | 4 | 2 1/2 x 6 1/2 | 19.59 |
| | 3 | | | | | | 20.44 | 4 ¹⁵ / ₁₆ | 8 | 4 | 20.44 | | 4 ¹⁵ / ₁₆ | 8 | 4 | 2 1/2 x 6 1/2 |
| | 4 | | | | - | - | 4 ¹¹ / ₁₆ | 6 | 2 | 15.97 | 4 ¹¹ / ₁₆ | | 11 1/2 | 5 | 3 1/2 x 10 | 21.85 |
| | 5 | | | | 2,000 | 800 | 4 ¹⁵ / ₁₆ | 11 1/2 | 5 | 22.30 | 4 ¹⁵ / ₁₆ | | 11 1/2 | 5 | 3 1/2 x 10 | 22.70 |
| 6 | 23.15 | 4 ¹⁵ / ₁₆ | 11 1/2 | 5 | | | 23.15 | 4 ¹⁵ / ₁₆ | 11 1/2 | 5 | 3 1/2 x 10 | 23.55 | | | | |

* Side load is only applicable if appropriate endplates are added to slide or "T" Section

** With the Fig. 432 clamp, add the material thickness. The Tees are now being notched for the material thickness when welding on the Fig. 212 See page 141.

Fig. 257 and 436 PTFE Pipe Slide Assemblies

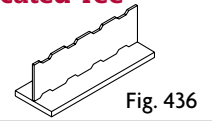
Notes:

- Types 1, 2, and 3 provide for longitudinal movement only.
- Types 4, 5, and 6 provide for both longitudinal and transverse movement of piping.

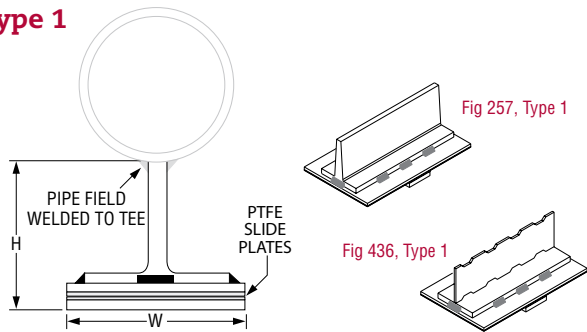
Structural Tee



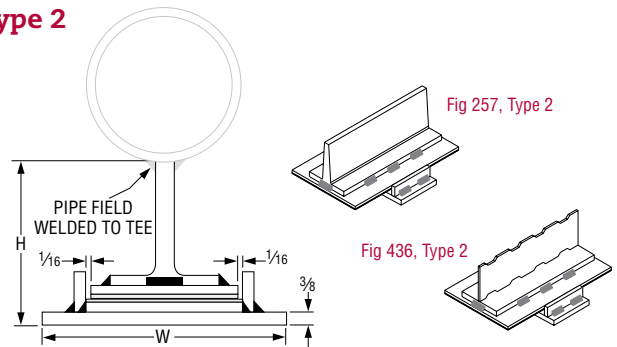
Fabricated Tee



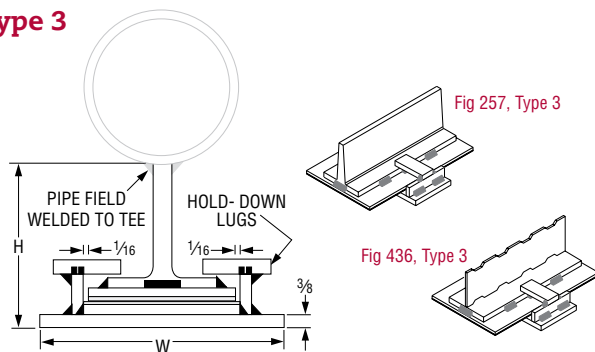
Type 1



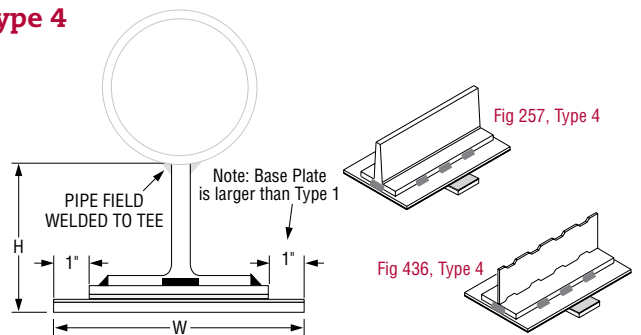
Type 2



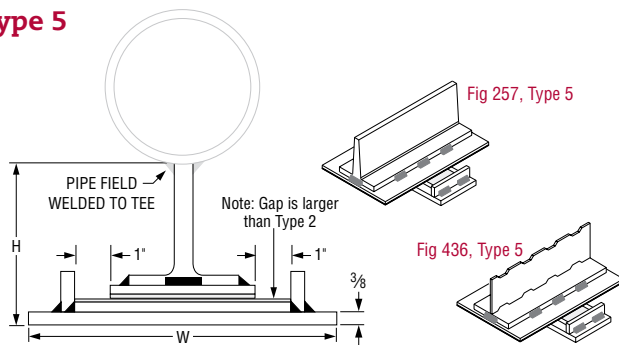
Type 3



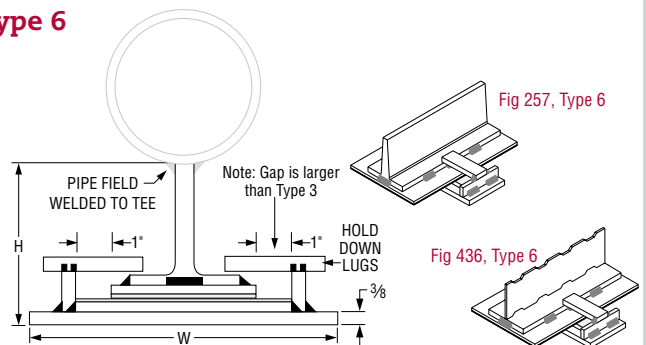
Type 4



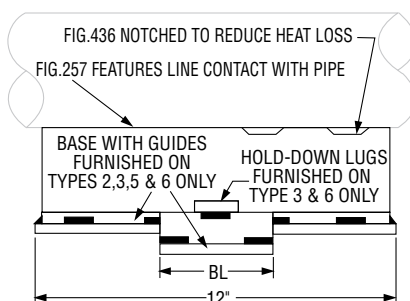
Type 5



Type 6



Side View, All Types



Options (for all types)

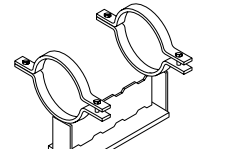
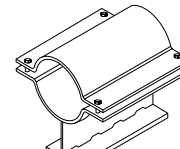
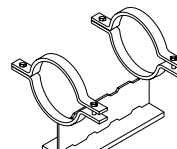
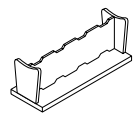
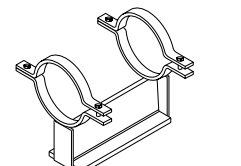
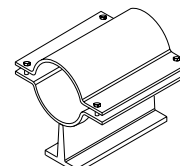
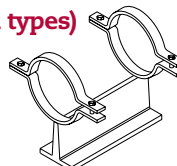
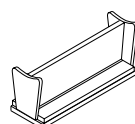


Fig. 439: Structural "H" Slide Assembly
Fig. 439A: Structural "H"

Pipe Slide Assembly, Complete

Size Range: 6" through 36"

Material: Carbon steel "H" section, PTFE bonded slide plates and carbon steel base.

Finish: Plain, Painted or Hot-Dip Galvanized (Welded after Galvanizing and Cold Spray Touched-up)

Service: A heavy duty slide support where horizontal movement resulting from expansion and contraction takes place and where a low coefficient of friction is desired.

Approvals: Complies with Federal Specification A-A-1192A (Type 35), ANSI/MSS SP-69 and MSS SP-58 (Type 35).

Maximum Load: As indicated at 70° F see page 149 for rating factor at higher temperatures.

Maximum Temperature: 750° F

Temperature Range at PTFE: -20° F to 400° F

Features:

- No lubrication required.
- Allows up to 4" of insulation.
- Allows up to 10" travel standard.
- Weld in place design.

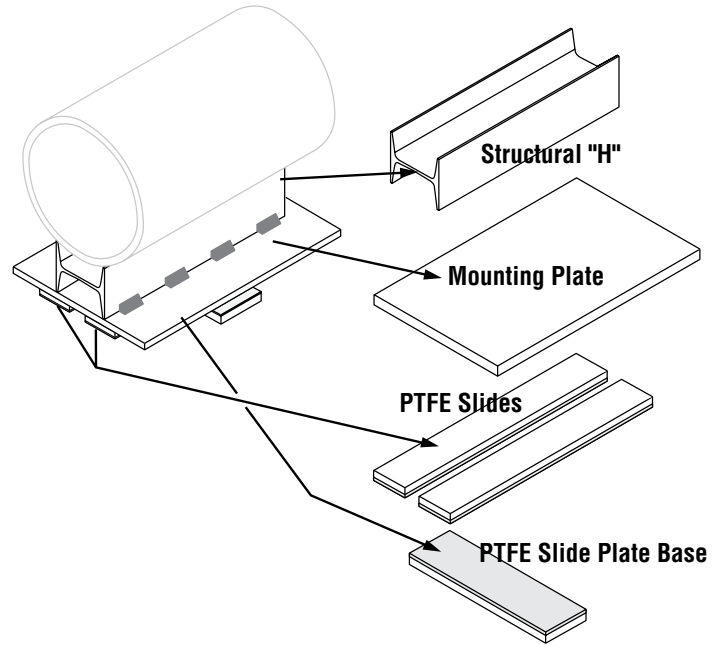
Available Options:

- Increased travels.
- Increased "H" Section heights.
- Clamps, Fig. 212 or Fig. 432.
- Base plate with mounting holes. The bolt spacing for the bolted base plates is equal to the "W" dimension minus 1 1/2" and the "BL" dimension minus 1 1/2" for all pipe sizes and the hole diameter is 9/16" for all sizes.

Ordering: Specify figure number, type, name, finish and any other option desired.

Notes: Types 1, 2, and 3 provide for longitudinal movement only. Types 4 and 5 provide for both longitudinal and transverse movement of piping.

PTFE Pipe Slide Assembly – "H" Type



Note: In the PH-92 and PH-92R Catalogs:

The Fig. 439 (slide "H" section only) formerly referred to as Fig. 437.

The Fig. 439 (slide base plate) formerly referred to as Fig. 438 (slide base plate).

The acceptability of galvanized coatings at temperatures above 450°F is at the discretion of the end user.

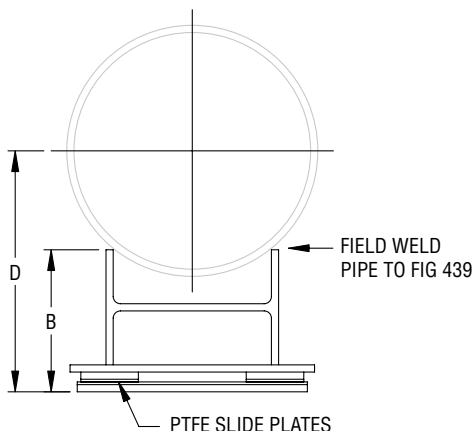


FIG. 439: DIMENSIONS (IN) • LOADS (LBS)

| Pipe Size | B | | | D | | | Max Load | | | | | |
|-----------|--------|---------|--------|--------|--------|----------|----------|-------------------|-----------|--------|-------|-------|
| | Type | | | Type | | | Down | Side Type 2, 3, 5 | Up Type 3 | | | |
| | 1 & 4 | 2 & 5 | 3 | 1 & 4 | 2 & 5 | 3 | | | | | | |
| 6 | 5 | 5 1/4 | 5 5/16 | 7 3/4 | 8 | 8 | 12,000 | 3,000 | 1,200 | | | |
| 8 | | | | 8 3/4 | 9 | 9 | | | | | | |
| 10 | 5 1/8 | 5 3/8 | 5 7/16 | 9 5/8 | 9 5/8 | 9 15/16 | | | | 16,000 | 4,000 | 1,600 |
| 12 | | | | 10 3/4 | 11 | 11 1/16 | | | | | | |
| 14 | | | | 10 7/8 | 11 1/8 | 11 3/16 | | | | | | |
| 16 | | | | 12 1/8 | 12 3/8 | 12 1/16 | | | | | | |
| 18 | | | | 12 5/8 | 12 7/8 | 12 15/16 | | | | | | |
| 20 | 5 1/4 | 5 1/2 | 5 9/16 | 13 3/4 | 14 | 14 1/16 | 24,000 | 6,000 | 2,400 | | | |
| 24 | | | | 15 5/8 | 15 5/8 | 15 15/16 | | | | | | |
| 30 | | | | 19 5/8 | 19 5/8 | 20 1/16 | | | | | | |
| 36 | 6 7/16 | 6 13/16 | 6 3/4 | 23 | 23 3/4 | 23 7/16 | | | | | | |

Note 1: With clamps; add material thickness of a Figure 212.

Note 2: With the Figure 432 special clamp, add the material thickness of Figure 432. See page 154.

Note 3: For bolted bases add 3/8" to B and D.

Fig. 439

Structural "H" Slide Assembly, Complete

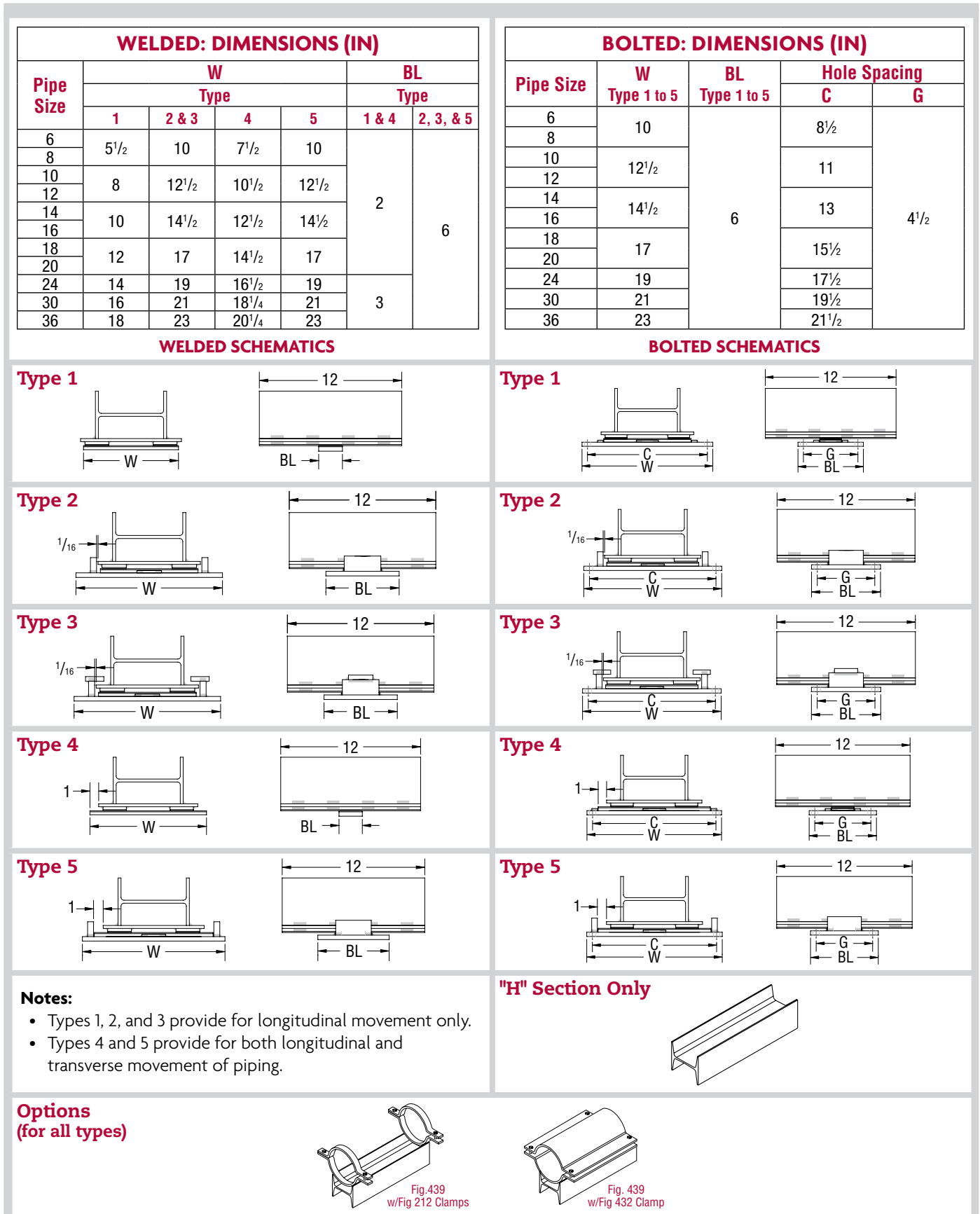


Fig. 432

Special Clamp

Size Range: 2" through 24"

Material: Carbon steel

Finish: Plain or Hot-Dip Galvanized with Zinc Plated Bolts & Nuts

Maximum Temperature: Plain 750° F, Galvanized 450° F

for carbon steel pipe only

Service: Used with and where pipe slides cannot be welded directly to pipe or copper tube. When used with fiberglass, plastic, or aluminum pipe, a thin protective liner should be inserted between the pipe and the clamp. Clamp is designed for use with Figure 257 and Figures 436 and 439 slides and tees.

Ordering: Specify figure number, pipe size, name and finish.

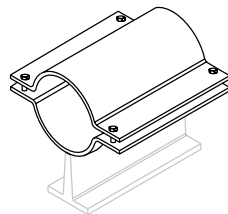


Fig. 257
w/Fig 432 Clamp

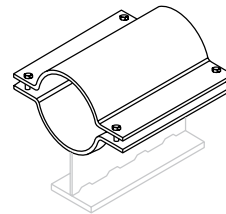


Fig. 436
w/Fig 432 Clamp

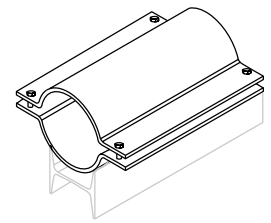


Fig. 439
w/Fig 432 Clamp

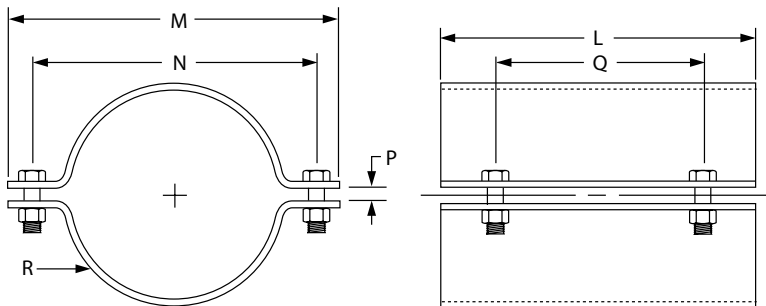


FIG. 432: DIMENSIONS (IN) • WEIGHT (LBS)

| Pipe Size | L | M | N | P | Q | R Stock Size | Weight |
|-----------|----|--------|--------|-----|-------|-----------------|--------|
| 2 | 6 | 5 | 4 | 1/4 | 4 1/2 | 1/8 x 6 | 2 |
| 2 1/2 | | 5 1/2 | 4 1/2 | | | | 3 |
| 3 | | 6 | 5 | | | | 3 |
| 3 1/2 | | 6 1/2 | 5 1/2 | | | | 4 |
| 4 | | 7 | 6 | | | | 4 |
| 5 | 8 | 8 | 7 | 3/8 | 6 | 3/16 x 8 | 5 |
| 6 | | 9 5/8 | 8 1/2 | | | | 12 |
| 8 | | 11 5/8 | 10 1/2 | | | | 15 |
| 10 | | 13 3/4 | 12 5/8 | | | | 18 |
| 12 | | 15 3/4 | 14 5/8 | | | | 21 |
| 14 | 12 | 17 7/8 | 16 1/2 | 1/2 | 8 | 1/4 x 12 | 41 |
| 16 | | 19 7/8 | 18 1/2 | | | | 46 |
| 18 | | 21 7/8 | 20 1/2 | | | | 52 |
| 20 | | 23 3/8 | 22 1/2 | | | | 57 |
| 24 | | 28 1/8 | 26 5/8 | | | | 67 |

Fig. 171: Pipe Roll

Single Pipe Roll

Size Range: 1" through 30"

Material: Cast iron roll and sockets, steel roll rod

Finish: Plain, Zinc Plated (Hot-Dip Galvanized optional) or Resilient Coated

Service: For suspension of pipe from two rods where longitudinal expansion and contraction may occur.

Approvals: Complies with Federal Specification A-A-1192A (Type 41), WW-H-171-E (Type 42), ANSI/MSS SP-69 and MSS SP-58 (Type 41).

Adjustment: Adjustable socket permits vertical adjustment at the roll.

Maximum Temperature: 400° F at roller, 300° F at resilient coated roller.

How to size:

- (1) If the roll is to support non-insulated pipe, select the size directly from nominal pipe size (column 1) in table below.
- (2) If used with pipe covering protection saddle, see page 164 for size of pipe roll.

Features:

- Provides for vertical adjustment; nut at bottom of hanger rod fits into the socket preventing loosening or turning due to vibration.
- Pipe roll is designed for two point surface contact with pipe or saddle.

Features: Advantages of pipe rollers with a protective resilient coated covering.

- Non conductive pipe rollers - prevent the passing of current from pipeline to structure.
- Corrosion resistant - for protection against severe weather conditions, moderate corrosive conditions such as marine atmospheres and weather resistant to ultra-violet radiation.
- Low coefficient of friction between pipe and resilient coated pipe roller.

Ordering:

- Specify pipe roll size.
- Order should include figure number, name and finish in all cases. Hanger rods and nuts to be ordered separately.
- Be certain to order oversized rolls when insulation and protection saddles makes this necessary.

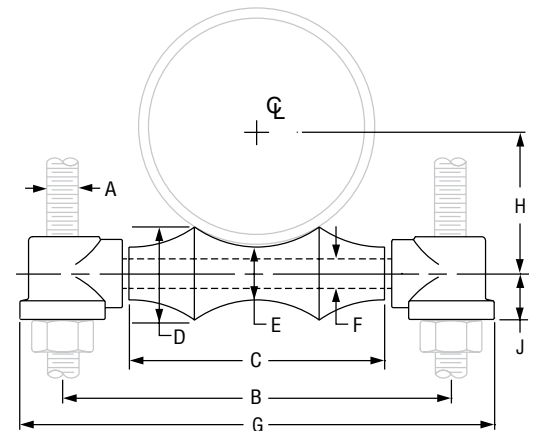


FIG. 171: DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS)

| Pipe Size | Max O.D. Covering | Rod Size A | Max Load | Weight | G | B | C | D | E | F | H | J |
|-----------|-------------------|------------|----------|--------|----------|----------|---------|---------|-------|-------|---------|--------|
| 1 | 2 | 3/8 | 600 | 0.45 | 4 1/8 | 3 | 1 1/2 | 1 | 3/4 | 3/8 | 1 1/16 | 9/16 |
| 1 1/4 | 2 1/2 | | | 0.48 | 4 1/2 | 3 3/8 | 1 7/8 | 1 1/16 | | | | |
| 1 1/2 | 2 3/4 | | | 0.51 | 4 3/4 | 3 5/8 | 2 1/8 | 1 1/8 | | | | |
| 2 | 3 1/4 | | | 0.57 | 5 1/4 | 4 1/8 | 2 5/8 | 1 3/16 | | | | |
| 2 1/2 | 3 3/4 | 1/2 | 660 | 1.00 | 6 1/4 | 4 7/8 | 3 3/8 | 1 3/8 | 7/8 | 1/2 | 1 15/16 | 1 1/16 |
| 3 | 4 1/2 | | 700 | 1.10 | 6 7/8 | 5 1/2 | 3 3/4 | 1 7/16 | | | 2 1/4 | |
| 3 1/2 | 5 | 5/8 | 750 | 1.40 | 7 1/2 | 6 1/8 | 4 1/4 | 1 5/8 | 1 | 1/2 | 2 9/16 | 3/4 |
| 4 | 5 1/2 | | | 1.70 | 8 1/4 | 6 7/8 | 4 3/4 | 1 3/4 | | | 2 13/16 | |
| 5 | 7 | 3/4 | 1,070 | 2.60 | 9 11/16 | 8 1/16 | 5 13/16 | 2 | 1 1/8 | 5/8 | 3 1/16 | 7/8 |
| 6 | 8 1/4 | | | 4.50 | 11 1/16 | 9 9/16 | 6 7/8 | 2 5/16 | | | 1 1/4 | |
| 8 | 10 1/2 | 7/8 | 1,350 | 7.20 | 14 1/16 | 11 15/16 | 8 7/8 | 2 13/16 | 1 1/2 | 7/8 | 5 5/8 | 1 1/8 |
| 10 | 12 3/4 | | | 9.50 | 16 3/16 | 14 1/16 | 11 | 3 3/8 | | | 1 3/4 | |
| 12 | 14 3/4 | 1 | 2,400 | 15.90 | 17 15/16 | 15 13/16 | 12 1/2 | 3 3/8 | 2 | 1 | 7 7/16 | 1 1/4 |
| 14 | 16 1/4 | | | 24.30 | 20 3/8 | 17 3/4 | 14 1/4 | 4 5/8 | | | 2 1/2 | |
| 16 | 18 | 1 1/4 | 3,970 | 31.90 | 22 3/8 | 19 3/4 | 16 1/4 | 5 | 2 5/8 | 1 1/4 | 9 7/16 | 1 1/2 |
| 18 | 20 1/4 | | | 35.50 | 24 1/2 | 21 7/8 | 18 1/4 | 5 7/16 | | | 2 3/4 | |
| 20 | 22 1/2 | 1 1/2 | 4,550 | 47.00 | 27 1/4 | 24 1/4 | 20 1/4 | 6 | 3 | 1 1/2 | 11 5/8 | 1 5/8 |
| 24 | 26 1/2 | | | 76.30 | 32 3/8 | 28 3/8 | 24 1/4 | 7 3/16 | | | 3 5/8 | |
| 30 | 32 1/2 | | 7,290 | 129.90 | 39 | 35 1/2 | 30 1/4 | 8 15/16 | 4 1/2 | 1 3/4 | 17 7/16 | 2 7/16 |

| DI/CI ROLL SIZING | |
|-------------------|----------------------|
| DI/CI Pipe Size | Fig. 171 Roller Size |
| 3 | 4 |
| 4 | 5 |
| 6 | 6 |
| 8 | 8 |
| 10 | 10 |
| 12 | 14 |
| 14 | 16 |
| 16 | 18 |
| 18 | 20 |
| 20 | 24 |
| 24 | 30 |
| 30 | No Recom. |

Fig. 175

Roller Chair

Size Range: 2" through 30" pipe

Material: Cast iron roll, steel chair, roll rod, bolts and hex nuts

Finish: Plain, Hot-Dip Galvanized Chair with Zinc Plated Parts or Resilient Coated

Maximum Temperature: 400° F at roller, 300° F at resilient coated roller.

Service: For support of pipe where longitudinal movement due to expansion and contraction may occur, but where no vertical adjustment is required.

Approvals: Complies with Federal Specification A-A-1192A (Type 44), WW-H-171-E (Type 45), ANSI/MSS SP-69 and MSS SP-58 (Type 44).

Installation: Two bolts and nuts provide anchorage to floor or top of steel beam or bracket or chair may be welded to supporting steel.

Features: Advantages of pipe rollers with a protective resilient coated covering.

- Non conductive pipe rollers - prevent the passing of current from pipeline to structure.
- Corrosion resistant - for protection against severe weather conditions, moderate corrosive conditions such as marine atmospheres and weather resistant to ultra-violet radiation.
- Low coefficient of friction between pipe and resilient coated pipe roller.

How to size:

- (1) If roll is to support bare pipe, select the size directly from nominal pipe size (see below).
- (2) If used with pipe covering protection saddle, see page 164 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 size of roll, figure number, name and finish. Be certain to order oversized rolls when insulation and protection saddles are required.

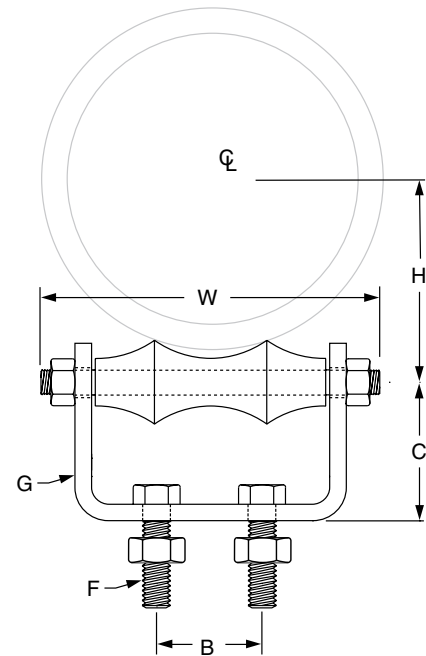


FIG. 175: DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS)

| Pipe Size | Max Load | Weight | W | B | C | F | G Width | H |
|-----------|----------|--------|----------|--------|--------|-------------|---------|-------------|
| 2 | 600 | 1.1 | 4 | 1 1/4 | 1 1/2 | 3/8 x 1 1/2 | 1 1/4 | 1 5/8 |
| 2 1/2 | 660 | 1.4 | 4 7/8 | | 1 5/8 | | | |
| 3 | 700 | 1.6 | 5 3/8 | 1 3/4 | 1 1/2 | | 2 1/4 | |
| 3 1/2 | 750 | 2.6 | 6 1/8 | 2 1/16 | | | 2 9/16 | |
| 4 | | 2.9 | 6 5/8 | 2 5/16 | 2 3/16 | | | |
| 5 | | 3.7 | 7 7/8 | 3 | 2 1/2 | 3 7/16 | | |
| 6 | 1,070 | 5.9 | 9 1/4 | 3 3/8 | 2 3/4 | 1/2 x 1 1/2 | 2 | 4 |
| 8 | 1,350 | 9.0 | 11 5/8 | 3 3/8 | 3 | | | 5/8 x 1 1/2 |
| 10 | 1,730 | 13.8 | 14 3/8 | 5 1/4 | 3 5/8 | 5/8 x 2 | 2 | 6 3/8 |
| 12 | 2,400 | 18.9 | 16 1/8 | 5 1/2 | 4 1/8 | | | 7 7/16 |
| 14 | 3,130 | 28.07 | 18 3/4 | 6 1/2 | 4 1/16 | 3/4 x 2 | 2 1/2 | 8 3/8 |
| 16 | 3,970 | 34.93 | 21 | 8 1/4 | 5 3/8 | | | 9 3/8 |
| 18 | 4,200 | 44.35 | 23 1/8 | 9 1/4 | 6 | 3/4 x 2 1/2 | 3 | 10 7/16 |
| 20 | 4,550 | 56.34 | 24 5/8 | 10 1/4 | 6 1/2 | | | 11 5/8 |
| 24 | 6,160 | 87.52 | 29 3/8 | 12 1/4 | 7 7/8 | 7/8 x 3 1/2 | 4 | 14 |
| 30 | 7,290 | 151.25 | 34 13/16 | 15 3/8 | 8 3/4 | | | 6 |

DI/CI ROLL SIZING

| DI/CI Pipe Size | Fig. 175 Roller Size |
|-----------------|----------------------|
| 3 | 4 |
| 4 | 5 |
| 6 | 6 |
| 8 | 8 |
| 10 | 10 |
| 12 | 14 |
| 14 | 16 |
| 16 | 18 |
| 18 | 20 |
| 20 | 24 |
| 24 | 30 |
| 30 | No Recom. |

Fig. 177

Adjustable Pipe Roll Support

Size Range: 1" through 30"

Material: Cast iron roll and sockets; steel roll rod, continuous thread rods and hex nuts

Finish: Plain, Zinc Plated (Hot-Dip Galvanized optional) or Resilient Coated

Service: For support of pipe where longitudinal movement due to expansion and contraction will occur and where vertical adjustment up to 6" may be necessary.

Maximum Temperature: 400° F at roller, 300° F at Resilient coated roller.

Approvals: Complies with Federal Specification A-A-1192A (Type 41), WW-H-171-E (Type 42), ANSI/MSS SP-69 and MSS SP-58 (Type 41).

Installation: Normally used directly above steel beams, brackets angles, etc.

Features: Advantages of pipe rollers with a protective resilient coated covering.

- Non conductive pipe rollers - prevent the passing of current from pipeline to structure.
- Corrosion resistant - for protection against severe weather conditions, moderate corrosive conditions such as marine atmospheres and weather resistant to ultra-violet radiation.
- Low coefficient of friction between pipe and resilient coated pipe roller.

How to size:

- (1) If roll is to support bare pipe, select the size directly from nominal pipe size (see below).
- (2) If used with pipe covering protection saddle, see page 164 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 size of roll, figure number and name. Be certain to order oversized rolls when insulation and protection saddles makes this necessary.

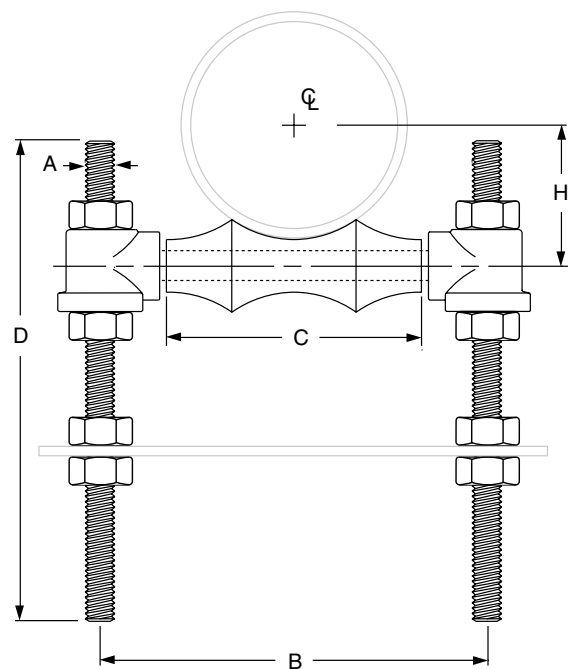
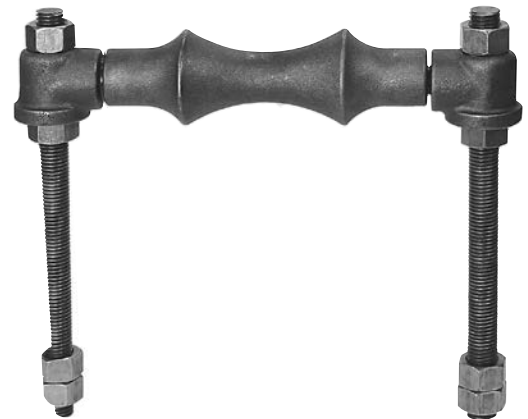


FIG. 177: DIMENSIONS (IN) • WEIGHT (LBS)

| Pipe Size | Weight | A | B | C | D | H |
|-----------|--------|-------|----------|---------|--------|---------|
| 1 | 1.1 | 3/8 | 3 | 1 1/2 | 12 | 1 1/16 |
| 1 1/4 | 1.2 | | 3 3/8 | 1 7/8 | | 1 1/4 |
| 1 1/2 | 1.2 | | 3 5/8 | 2 1/8 | | 1 3/8 |
| 2 | 1.3 | | 4 1/8 | 2 5/8 | | 1 5/8 |
| 2 1/2 | 2.3 | 1/2 | 4 7/8 | 3 3/8 | | 1 15/16 |
| 3 | 2.4 | | 5 1/2 | 3 3/4 | | 2 1/4 |
| 3 1/2 | 2.7 | 5/8 | 6 1/8 | 4 1/4 | | 2 9/16 |
| 4 | 3.8 | | 6 7/8 | 4 3/4 | | 2 13/16 |
| 5 | 4.7 | | 8 1/16 | 5 13/16 | | 3 3/16 |
| 6 | 7.6 | 3/4 | 9 9/16 | 6 7/8 | | 4 |
| 8 | 11.0 | | 11 15/16 | 8 7/8 | | 5 1/8 |
| 10 | 13.7 | 7/8 | 14 1/16 | 11 | | 6 3/8 |
| 12 | 19.4 | | 15 13/16 | 12 1/2 | 7 1/16 | |
| 14 | 31.2 | 1 | 17 3/4 | 14 1/4 | 18 | 8 3/8 |
| 16 | 42.5 | | 19 3/4 | 16 1/4 | | 9 7/16 |
| 18 | 46.6 | | 21 7/8 | 18 1/4 | | 10 1/2 |
| 20 | 66.2 | 1 1/4 | 24 1/4 | 20 1/4 | | 11 5/8 |
| 24 | 102.5 | | 28 7/8 | 24 1/4 | | 14 |
| 30 | 186.8 | 1 1/2 | 35 1/2 | 30 1/4 | | 24 |

| DI/CI ROLL SIZING | |
|-------------------|----------------------|
| DI/CI Pipe Size | Fig. 177 Roller Size |
| 3 | 4 |
| 4 | 5 |
| 6 | 6 |
| 8 | 8 |
| 10 | 10 |
| 12 | 14 |
| 14 | 16 |
| 16 | 18 |
| 18 | 20 |
| 20 | 24 |
| 24 | 30 |
| 30 | No Recom. |

Fig. 178

Spring Cushion Hanger

Material: Spring cushion hanger Fig. 178 consists of a set of two springs and four cast iron retainers only.

Finish: Retainers: Plain or Hot-Dip Galvanized, Springs: Painted

Service: Generally used with Fig. 171 single pipe roll as shown in above photo. Recommended for installations where formal load and movement calculations are not required, or calculated movement does not exceed 1/4".

Maximum Temperature: 400° F at roller

Approvals: Complies with Federal Specification A-A-1192A (Type 49), WW-H-171-E (Type 50), ANSI/MSS SP-69 and MSS SP-58 (Type 49).

Ordering: Specify figure number, name and rod size. If used with Fig. 171 single pipe roll, pipe roll must be ordered separately.

The retainers are casted to the dimensions as shown, but center hole can be drilled or reamed larger to satisfy the hanger rod required, up to the max rod size.

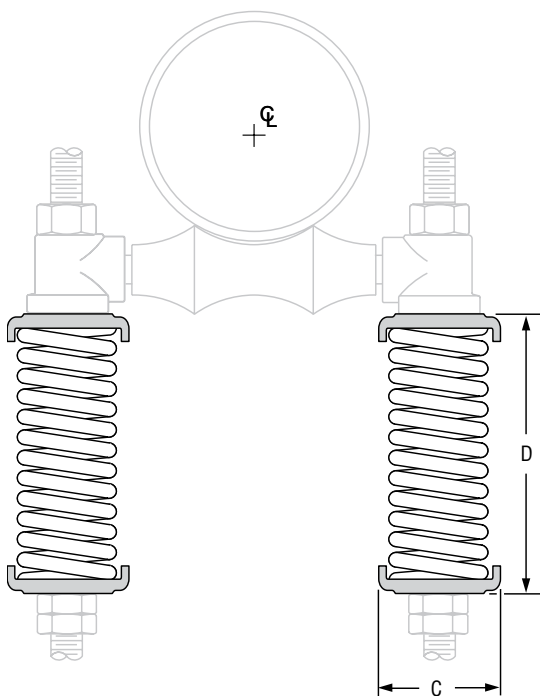
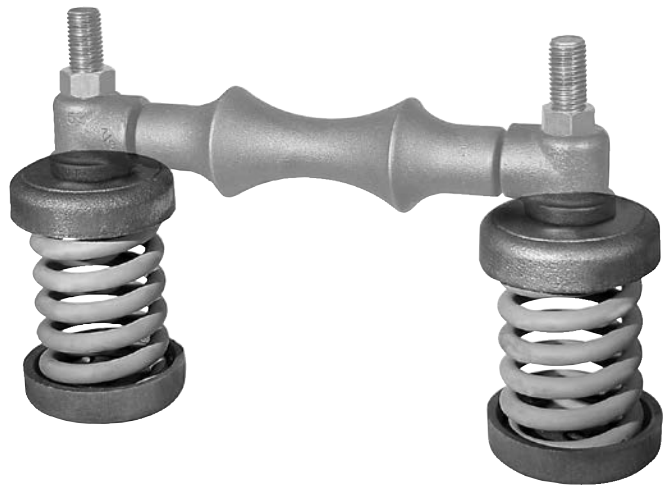


FIG. 178: DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS)

| Spring No. | Max Spring Deflection * | Load at Max Deflection ■ | Deflection Rate of Hanger (lbs / inch) | Weight | C | D | Core Hole Dia. | For Rod Size | Max Rod Size ** |
|------------|-------------------------|--------------------------|--|--------|---------------------------------|--------------------------------|---------------------------------|--------------|-----------------|
| 1 | 1/4 | 535 | 428 | 4.5 | 2 ²¹ / ₃₂ | 6 ⁷ / ₁₆ | 7 ¹ / ₁₆ | 3/8 | 3/4 |
| 2 | | 1,500 | 1,200 | 14.0 | 4 ¹ / ₈ | 6 ¹ / ₁₆ | 9 ¹ / ₁₆ | 1/2 | |
| 3 | | 3,000 | 2,400 | 22.0 | 4 ¹ / ₈ | 9 ¹ / ₁₆ | 15 ¹ / ₁₆ | 7/8 | 1 1/2 |

* At maximum recommended deflection, spring can be compressed an additional 1/4" before becoming solid.

■ Maximum capacity of double spring hanger.

** Can be drilled to max. rod size.

Fig. 181

Adjustable Steel Yoke Pipe Roll

Size Range: 2 1/2" through 24"

Material: Cast iron roll; carbon steel yoke, roll rod and hex nuts

Finish: Plain, Hot-Dip Galvanized Yoke with Zinc Plated Parts or Resilient Coated

Service: For suspension of pipe from a single rod where longitudinal movement may occur because of expansion or contraction.

Maximum Temperature: 400° F at roller, 300° F at resilient coated roller.

Approvals: Complies with Federal Specification A-A-1192A (Type 43), WW-H-171-E (Type 44), ANSI/MSS SP-69 and MSS SP-58 (Type 43).

Features: Advantages of pipe rollers with a protective resilient coated covering.

- Non conductive pipe rollers - prevent the passing of current from pipeline to structure.
- Corrosion resistant - for protection against severe weather conditions, moderate corrosive conditions such as marine atmospheres and weather resistant to ultra-violet radiation.
- Low coefficient of friction between pipe and resilient coated pipe roller.

How to size: If the roll is to support bare pipe, select the size directly from nominal pipe size (see below). If used with pipe covering protection saddle, see page 164 for size of pipe roll to be used.

Ordering: Specify pipe roll size, figure number, name and finish. Be certain to order oversized rolls when insulation and protection saddles are required.

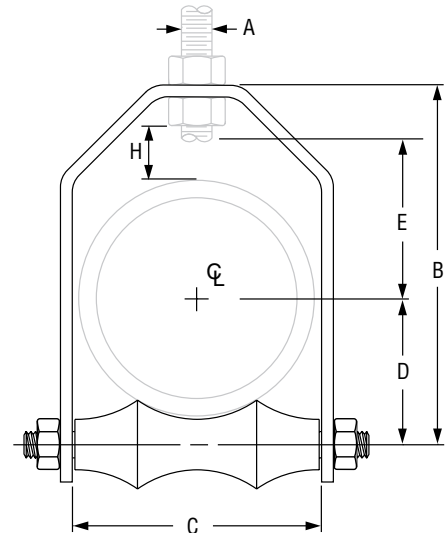


FIG. 181: DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS)

| Pipe Size | Max O.D. of Covering | Max Load | Weight | Rod Size A | B | C | D | Rod Take Out - E | H |
|-----------|--------------------------------|----------|----------------------------------|------------|----------------------------------|---------------------------------|----------------------------------|---------------------------------|---------------------------------|
| 2½ | 3 | 225 | 1.7 | ½ | 5¾ | 3¼ | 1 ¹⁵ / ₁₆ | 2 ⁷ / ₈ | 1 ¹¹ / ₁₆ |
| 3 | 3 ⁵ / ₈ | 310 | 2.2 | | 6 ³ / ₈ | 3 ⁷ / ₈ | 2¼ | 3 ³ / ₈ | 1 ⁵ / ₈ |
| 3½ | 4 ¹ / ₈ | 390 | 2.5 | | 7 | 4 ³ / ₈ | 2 ⁹ / ₁₆ | 3½ | 1 ¹¹ / ₁₆ |
| 4 | 4 ¹ / ₁₆ | 475 | 3.2 | 5/8 | 7 ⁹ / ₁₆ | 4 ¹⁵ / ₁₆ | 2 ¹³ / ₁₆ | 3 ⁵ / ₈ | 1 ⁵ / ₈ |
| 5 | 5¾ | 685 | 6.3 | | 9 ⁹ / ₈ | 6 | 3 ⁷ / ₁₆ | 4½ | 1 ¹⁵ / ₁₆ |
| 6 | 6 ⁶ / ₈ | 780 | 9.3 | ¾ | 10 ⁵ / ₁₆ | 7 ¹ / ₈ | 4 | 5 | 1 ⁷ / ₈ |
| 8 | 9 | | 14.5 | | 12 ¹¹ / ₁₆ | 9¼ | 5 ¹ / ₈ | 6 ⁶ / ₈ | 2 |
| 10 | 11 | 965 | 18.8 | 7/8 | 15 ¹ / ₁₆ | 11¼ | 6 ⁶ / ₈ | 7¼ | 2 ¹ / ₁₆ |
| 12 | 13 | 1,200 | 27.7 | | 17 ⁷ / ₁₆ | 13¾ | 7 ⁷ / ₁₆ | 8 ³ / ₈ | 2¼ |
| 14 | 14¼ | | 39.1 | 1 | 18 ⁷ / ₈ | 14½ | 8 ³ / ₈ | 8¾ | 2 |
| 16 | 16¼ | 49.1 | 20 ¹³ / ₁₆ | | 16½ | 9 ⁹ / ₈ | 9 ¹¹ / ₁₆ | 1 ¹⁵ / ₁₆ | |
| 18 | 18¼ | 1,400 | 57.8 | 1¼ | 23¾ | 18½ | 10 ⁷ / ₁₆ | 11 ⁷ / ₁₆ | 2 ¹³ / ₁₆ |
| 20 | 20¼ | 1,600 | 75.9 | | 26 | 20½ | 11 ⁵ / ₈ | 12¼ | 2½ |
| 24 | 24¼ | 1,800 | 119.3 | 1½ | 32 ⁵ / ₁₆ | 24 ⁵ / ₈ | 13 ¹⁵ / ₁₆ | 15¾ | 4 ³ / ₈ |

| DI/CI ROLL SIZING | |
|-------------------|----------------------|
| DI/CI Pipe Size | Fig. 181 Roller Size |
| 3 | 4 |
| 4 | 5 |
| 6 | 6 |
| 8 | 8 |
| 10 | 10 |
| 12 | 14 |
| 14 | 16 |
| 16 | 18 |
| 18 | 20 |
| 20 | 24 |

Fig. 271: Complete

Pipe Roll Stand

Size Range: 2" through 42"

Material: Cast iron roll and stand

Finish: Plain, Zinc Plated (Hot-Dip Galvanized optional) or Resilient Coated

Service: For support of pipe where longitudinal movement due to expansion and contraction may occur but where no vertical adjustment is required.

Maximum Temperature: 400° F at roller, 300° F at resilient coated roller.

Approvals: Complies with Federal Specification A-A-1192A (Type 44), WW-H-171-E (Type 45), ANSI/MSS SP-69 and MSS SP-58 (Type 44).

Installation:

- (1) Two cored holes for anchorage bolts are provided on all sizes for fastening stands to structural supports, piers, floors, etc.
- (2) In addition, cored holes "N" at the four corners of the stand are provided for anchorage purposes.
- (3) The two cored holes on sizes 2" to 6" are on outside of stand (see dotted lines and dimension J').
- (4) On all other sizes, the holes are inside of uprights (see dimension J).

Features: Advantages of pipe rollers with a protective resilient coated covering.

- Non conductive pipe rollers - prevent the passing of current from pipeline to structure.
- Corrosion resistant - for protection against severe weather conditions, moderate corrosive conditions such as marine atmospheres and weather resistant to ultra-violet radiation.
- Low coefficient of friction between pipe and resilient coated pipe roller.

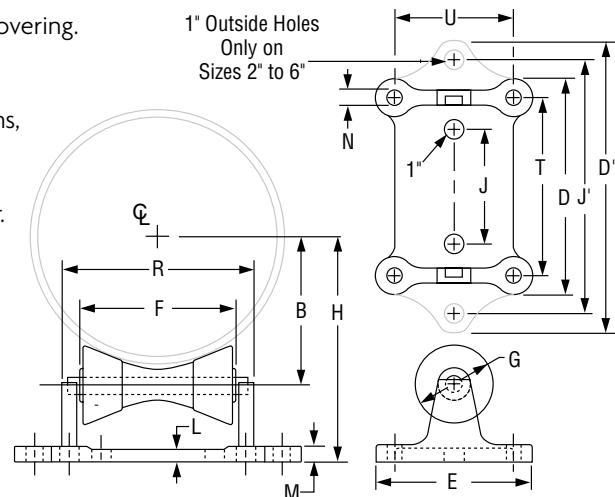
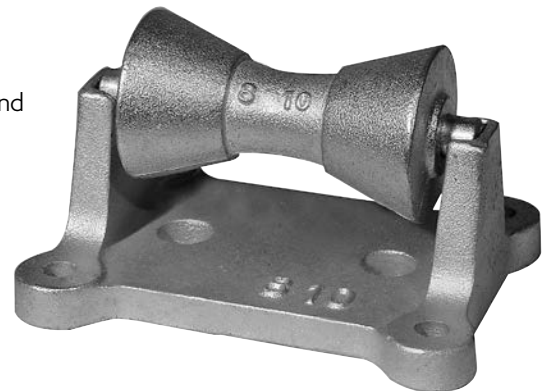
How to size:

- If roll is to support bare pipe, select the size directly from nominal pipe size (see below).
- If used with pipe covering protection saddle, see page 164 for size of pipe roll.

Ordering: Specify pipe roll size, figure number, name and finish. Be certain to order oversized rolls when insulation and protection saddle are required.

Note: Refer to Fig. 75 SD and 76 SD for additional pipe roll designs.

Standard line of carbon steel base plates available.



| FIG. 271: DIMENSIONS (IN) • WEIGHT (LBS) • LOADS (LBS) | | | | | | | | | | | | | | | | | | | |
|--|----------|--------|---------------------|-----|---------------------|----|-----|-----|-------------------|----|----|-----|-------|-------|-----|-------------------|----|---|---|
| Pipe Size | Max Load | Weight | H | B | D | D' | E | F | G | J | J' | L | M | N | R | T | U | | |
| 2 | 390 | 6.4 | 3½ | 1¾ | — | 8¾ | 5¾ | 2¾ | 1⅞ | — | 6¾ | ⅞ | 11/16 | ½ | 4 | 37/16 | 4 | | |
| 2½ | | | 3⅞ | 2½ | — | | | | | — | | | | | | | | | |
| 3 | | | 4⅞ | 2¾ | — | | | | | — | | | | | | | | | |
| 3½ | | | 4¾ | 2⅝ | — | | | | | — | | | | | | | | | |
| 4 | 950 | 8.9 | 4 ^{13/16} | 2¾ | — | 9⅞ | 5⅝ | 3¾ | 2 ^{1/16} | — | 7⅞ | ¾ | 7/8 | 5/8 | 7¾ | 4 ^{1/16} | 4¼ | | |
| 5 | | | 5 ^{1/16} | 3⅝ | — | | | | | — | | | | | | | | | |
| 6 | | | 6 ^{1/16} | 4 | — | | | | | — | | | | | | | | | |
| 8 | 2,100 | 15.3 | 8 ^{11/16} | 5¼ | 8¾ | — | 6¾ | 6 | 3¼ | 4 | — | ¾ | 7/8 | 5/8 | 7¾ | 7 | 5 | | |
| 10 | | | 9 ^{1/16} | 6¾ | | | | | | | | | | | | | | — | — |
| 12 | 3,075 | 28.1 | 11 ^{13/16} | 7½ | 10 ^{15/16} | — | 7⅞ | 8 | 4 | 5¾ | — | ¾ | 7/8 | ¾ | 9⅞ | 9 ^{1/16} | 6 | | |
| 14 | | | 12 | 8½ | | | | | | | | | | | | | | — | — |
| 16 | | | 13¾ | 9¾ | | | | | | | | | | | | | | — | — |
| 18 | 4,980 | 39.7 | 14¾ | 10¾ | 12¾ | — | 8¾ | 9 | 4½ | 6¾ | — | 7/8 | 1 | 13/16 | 11¼ | 10¼ | 6½ | | |
| 20 | | | 15¾ | 11¾ | | | | | | | | | | | | | | — | — |
| 24 | 6,100 | 49.6 | 17¾ | 13¾ | 13½ | — | — | 10 | 4 ^{7/16} | 7½ | — | 1 | 1⅞ | — | 12½ | 11¾ | — | | |
| 30 | 7,500 | 99.3 | 21⅞ | 16¾ | 17 | — | 10¾ | 12½ | 5½ | 10 | — | 1¼ | 1½ | 1⅞ | 15¾ | 14¼ | 8 | | |
| 36 | 12,000 | 152.0 | 25¾ | 20 | 20 | — | 12 | 15 | 6¾ | 12 | — | 1½ | 1¾ | 1⅞ | 18¾ | 17 | 9 | | |
| 42 | | | 28¾ | 23¾ | — | — | — | — | — | — | — | — | — | — | — | — | — | — | |

| DI/CI ROLL SIZING | |
|-------------------|----------------------|
| DI/CI Pipe Size | Fig. 271 Roller Size |
| 3 | 4 |
| 4 | 5 |
| 6 | 6 |
| 8 | 8 |
| 10 | 10 |
| 12 | 14 |
| 14 | 16 |
| 16 | 18 |
| 18 | 20 |
| 20 | 24 |
| 24 | 30 |
| 30 | N/A |

Fig. 274: with Base Plate
Fig. 275: without Base Plate
Fig. 274P: Cast Iron Base Plate only

Adjustable Pipe Roll Stand

Size Range: 2" through 42"

Material: Cast iron base plate, stand roll; steel adjusting screws

Finish: Plain, Zinc Plated (Hot-Dip Galvanized optional) or Resilient Coated

Service: For support of pipe lines where longitudinal movement due to expansion and contraction may occur and where vertical and lateral adjustment during installation may be required.

Maximum Temperature: 400° F at roller, 300° F resilient coated roller.

Approvals: Complies with Federal Specification A-A-1192A (Type 46), WW-H-171-E (Type 47), ANSI/MSS SP-69 and MSS SP-58 (Type 46).

Installation: Base plate is provided with two holes for anchorage to floor, pier, structural support and similar constructions, as well as to welded steel brackets Fig. 195 page 99 and Fig. 199, page 100. Adjustable pipe roll stand *without base plate*, Fig. 275, can be used for supporting tunnel piping, etc., by resting ends of adjusting screws on structural steel angles, channels, etc.

Adjustment: Vertical adjustment is obtained by use of the four adjusting screws located on corners of stand. Lateral adjustment is secured by stand sliding on each of adjusting screws.

Features: Advantages of pipe rollers with a protective resilient coated covering.

- Non conductive pipe rollers - prevent the passing of current from pipeline to structure.
- Corrosion resistant - for protection against severe weather conditions, moderate corrosive conditions such as marine atmospheres and weather resistant to ultra-violet radiation.
- Low coefficient of friction between pipe and resilient coated pipe roller.

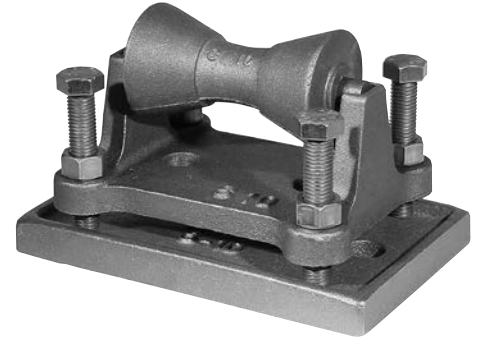
How to size:

- (1) If roll is to support bare pipe, select the size directly from nominal pipe size (see below).
- (2) If used with pipe covering protection saddle, see page 164 for size of pipe roll.

Ordering: Specify pipe roll size, figure number, name and finish. For further dimensions of stand, see Fig. 271, page 160. Be certain to order oversized rolls when insulation and protection saddles are required.

Note: Refer to Fig. 75 SD and 76 SD for additional pipe roll designs.

Standard line of carbon steel base plates available.



See Fig. 271 for Additional Dimensions

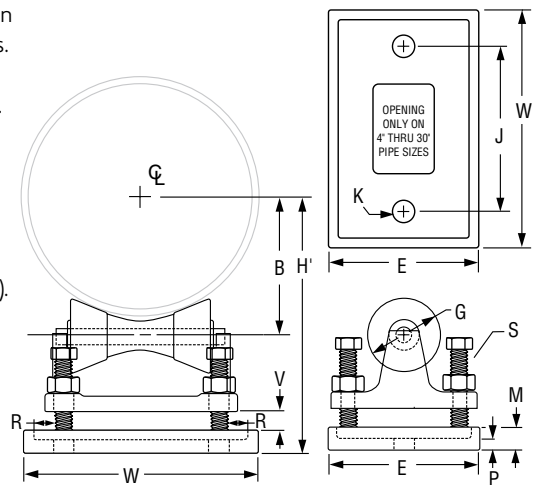


FIG. 274, 275, 274P: DIMENSIONS (IN)

| Pipe Size | Max Load | Weight | | | H' Min | H' Max | E | J | K | V Max | M | P | R | S | W |
|-----------|----------|----------|----------|-----------|--------|--------|--------|--------|-------|-------|-------|--------|--------|-------|--------|
| | | Fig. 274 | Fig. 275 | Fig. 274P | | | | | | | | | | | |
| 2 | 390 | 15.2 | 7.8 | 7.4 | 5 1/8 | 5 3/8 | 5 1/2 | 3 3/8 | 1 | 7/8 | 1 | 3/4 | 1 | 3/4 | 6 7/8 |
| 2 1/2 | | | | | 5 3/8 | 5 5/8 | | | | | | | | | |
| 3 | | | | | 5 3/4 | 6 | | | | | | | | | |
| 3 1/2 | | | | | 6 | 6 1/4 | | | | | | | | | |
| 4 | 950 | 19.3 | 10.3 | 9.0 | 6 1/2 | 7 | 5 3/4 | 5 1/8 | 1 | 1 1/8 | 1 | 3/4 | 1 | 3/4 | 8 1/8 |
| 5 | | | | | 7 | 7 1/2 | | | | | | | | | |
| 6 | | | | | 7 5/8 | 8 1/8 | | | | | | | | | |
| 8 | 2,100 | 32.1 | 18.1 | 14.0 | 10 3/8 | 11 1/8 | 6 3/4 | 7 3/8 | 1 | 1 3/4 | 1 1/8 | 1 1/16 | 1 | 3/4 | 10 5/8 |
| 10 | | | | | 11 1/2 | 12 3/4 | | | | | | | | | |
| 12 | | | | | 13 | 14 1/4 | | | | | | | | | |
| 14 | 3,075 | 51.2 | 32.1 | 19.1 | 13 3/8 | 14 3/4 | 8 | 9 1/2 | 1 | 1 3/4 | 1 1/8 | 3/4 | 1 | 7/8 | 13 |
| 16 | | | | | 15 1/4 | 16 3/8 | | | | | | | | | |
| 18 | | | | | 16 3/8 | 17 3/4 | | | | | | | | | |
| 20 | | | | | 17 3/8 | 18 3/4 | | | | | | | | | |
| 24 | 6,100 | 87.0 | 55.0 | 32.0 | 19 5/8 | 21 | 8 5/8 | 11 1/8 | 1 | 1 7/8 | 1 1/4 | 7/8 | 1 1/16 | 1 | 14 5/8 |
| 30 | | | | | 24 | 26 3/4 | | | | | | | | | |
| 36 | 12,000 | 304.0 | 176.0 | 128.0 | 28 3/8 | 31 3/4 | 10 1/2 | 15 3/4 | 1 | 3 1/4 | 1 1/8 | 1 1/4 | 1 3/8 | 1 1/4 | 19 1/4 |
| 42 | | | | | 31 1/2 | 34 3/8 | | | | | | | | | |
| 42 | 12,000 | 304.0 | 176.0 | 128.0 | 31 1/2 | 34 3/8 | 11 | 19 | 1 1/8 | 4 1/2 | 2 | 1 1/2 | 2 1/4 | 1 1/2 | 23 |

| DI/CI ROLL SIZING | |
|-------------------|----------------------|
| DI/CI Pipe Size | Fig. 274 Roller Size |
| 3 | 4 |
| 4 | 5 |
| 6 | 6 |
| 8 | 8 |
| 10 | 10 |
| 12 | 14 |
| 14 | 16 |
| 16 | 18 |
| 18 | 20 |
| 20 | 24 |
| 24 | 30 |
| 30 | N/A |

Fig. 277: with Cast Iron Base Plate

Pipe Roll and Base Plate

Size Range: 2" through 24"

Material: Cast iron roll and plate

Finish: Plain, Zinc Plated (Hot-Dip Galvanized optional) or Resilient Coated

Service: For support of pipe where small longitudinal movement due to expansion and contraction may occur and where no vertical adjustment is required.

Maximum Temperature: 400° F at roller, 300° F at resilient coated roller.

Approvals: Complies with Federal Specification A-A-1192A (Type 45) WW-H-171-E (Type 46), ANSI/MSS SP-69 and MSS SP-58 (Type 45).

Installation: Consist of sitting the unit in place. Weight of pipe and material hold unit in place.

How to size:

- (1) If roll is to support bare pipe, select the size directly from nominal pipe size (see below).
- (2) If used with pipe covering protection saddle, see page 164 for size of pipe roll.

Features: An economical, practical means of supporting pipe with limited horizontal movement due to expansion and contraction.

Features: Advantages of pipe rollers with a protective resilient coated covering.

- Non conductive pipe rollers - prevent the passing of current from pipeline to structure.
- Corrosion resistant - for protection against severe weather conditions, moderate corrosive conditions such as marine atmospheres and weather resistant to ultra-violet radiation.
- Low coefficient of friction between pipe and resilient coated pipe roller.

Ordering: Specify pipe roll size, figure number, name and finish.

Be certain to order oversized rolls when insulation and protection saddles are required.

Note: Fabricated carbon steel base plates for extended travel are available upon request. Refer to Fig. 75 SD and 76 SD for additional pipe roll designs.

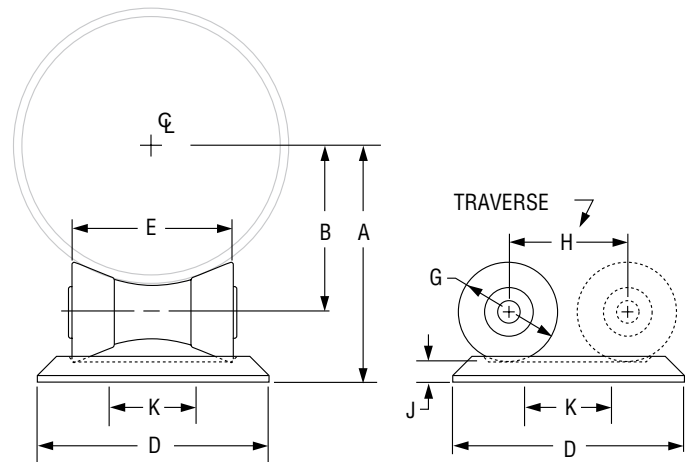


FIG. 277: DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS)

| Pipe Size | Max Load | Weight | A | B | D | E | G | H | J | K |
|-------------------------------|----------|--------|---------------------------------|--------------------------------|--------------------------------|-------------------------------|--------------------------------|-------------------------------|--------------------------------|-------------------------------|
| 2 | 390 | 4.0 | 3 ³ / ₄ | 1 ³ / ₄ | 4 ³ / ₄ | 2 ⁵ / ₈ | 1 ⁷ / ₈ | 1 ³ / ₄ | 1/2 | |
| 2 ¹ / ₂ | | | 3 ¹ / ₂ | 2 ¹ / ₈ | | | | | | |
| 3 | | | 3 ¹³ / ₁₆ | 2 ³ / ₈ | | | | | | |
| 3 ¹ / ₂ | | | 4 ¹ / ₁₆ | 2 ⁵ / ₈ | | | | | | |
| 4 | 950 | 5.6 | 4 ⁵ / ₁₆ | 2 ³ / ₄ | 5 ³ / ₄ | 3 ⁵ / ₈ | 2 ¹ / ₁₆ | 2 ⁵ / ₈ | 1/2 | 1 ¹ / ₂ |
| 5 | | | 4 ¹⁵ / ₁₆ | 3 ³ / ₈ | | | | | | |
| 6 | | | 5 ¹ / ₂ | 4 | | | | | | |
| 8 | 2,100 | 15.3 | 7 ⁹ / ₁₆ | 5 ¹ / ₄ | 8 ¹ / ₄ | 5 ⁵ / ₈ | 3 ¹ / ₄ | 4 | 1 ¹ / ₁₆ | 2 ¹ / ₂ |
| 10 | | | 8 ¹¹ / ₁₆ | 6 ³ / ₈ | | | | | | |
| 12 | 3,075 | 27.9 | 10 ¹ / ₄ | 7 ¹ / ₂ | 10 ³ / ₄ | 7 ⁵ / ₈ | 4 | 5 ⁵ / ₈ | 3/4 | 4 |
| 14 | | | 10 ⁷ / ₈ | 8 ¹ / ₈ | | | | | | |
| 16 | 4,980 | 43.7 | 12 ³ / ₈ | 9 ³ / ₈ | 12 | 8 ¹ / ₂ | 4 ¹ / ₂ | 6 ³ / ₈ | 7/8 | 5 |
| 18 | | | 13 ¹ / ₂ | 10 ⁵ / ₈ | | | | | | |
| 20 | | | 14 ¹ / ₂ | 11 ¹ / ₈ | | | | | | |
| 24 | 6,100 | 51.5 | 16 ⁵ / ₈ | 13 ³ / ₈ | 13 ³ / ₄ | 9 ¹ / ₂ | 4 ⁷ / ₁₆ | 7 ⁵ / ₈ | 1 | 5 ³ / ₄ |

DI/CI ROLL SIZING

| DI/CI Pipe Size | Fig. 277 Roller Size |
|-----------------|----------------------|
| 3 | 4 |
| 4 | 5 |
| 6 | 6 |
| 8 | 8 |
| 10 | 10 |
| 12 | 14 |
| 14 | 16 |
| 16 | 18 |
| 18 | 20 |
| 20 | 24 |

Fig. 76CP

Non-Conductive Roller

Description: Fabricated roller for large diameter pipe requiring isolation due to cathodic protection. Ten standard sizes for pipe of 30" - 72" and loads up to 60,000 lbs. Smaller sizes are available upon request. The base can be bolted or welded to the support structure. Alternative attachment configurations are available upon request. Contact Anvil EPS division 1-855-EPS-PIPE for further information and how to order.

Installation: The two piece fabricated roller is designed for one of the two rollers on each side of the assembly to be in contact with the pipe. Patent pending technology in the rollers isolate the pipe from the assembly. Used for piping cathodic protection.

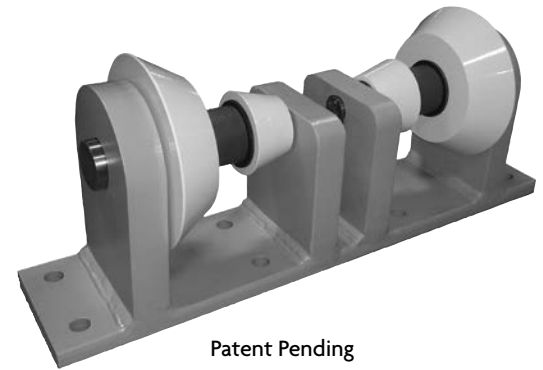


FIG. 76CP: DIMENSIONS (IN) • LOADS (LBS)

| Steel Pipe Size | Max Load | A | B | C | D | E |
|-----------------|----------|----------------------------------|--------------------------------|----------------------------------|----------------------------------|---------------------------------|
| 30 | 60,000 | 23 ⁵ / ₁₆ | 13 ⁵ / ₈ | 8 ³ / ₁₆ | 8 ¹⁵ / ₁₆ | 0 |
| 36 | | 26 | | | 9 ¹⁵ / ₁₆ | 1 |
| 42 | | 28 ⁷ / ₈ | | | 10 ¹⁵ / ₁₆ | 2 |
| 46 | | 30 ³ / ₄ | | | 11 ¹¹ / ₁₆ | 2 ³ / ₄ |
| 46 | 60,000 | 31 ⁷ / ₁₆ | 16 ¹ / ₄ | 10 ¹³ / ₁₆ | 13 | 1 ⁷ / ₁₆ |
| 48 | | 32 ⁷ / ₁₆ | | | 13 ⁷ / ₁₆ | 1 ³ / ₄ |
| 54 | | 34 ¹⁵ / ₁₆ | | | 14 ¹ / ₂ | 2 ¹⁵ / ₁₆ |
| 60 | | 37 ¹ / ₄ | | | 15 ¹¹ / ₁₆ | 4 ¹ / ₈ |
| 66 | | 40 ⁹ / ₁₆ | | | 16 ³ / ₄ | 5 ⁵ / ₁₆ |
| 72 | | 43 ³ / ₈ | | | 17 ¹³ / ₁₆ | 6 ¹ / ₄ |

FIG. 76CP: DIMENSIONS (IN) • LOADS (LBS)

| C.I./D.I. Pipe Size | Max Load | A | B | C | D | E |
|---------------------|----------|---------------------------------|--------------------------------|----------------------------------|--------------------------------|--------------------------------|
| 30 | 60,000 | 24 ³ / ₁₆ | 13 ⁵ / ₈ | 8 ³ / ₁₆ | 9 ¹ / ₄ | 7 ¹ / ₁₆ |
| 36 | | 27 ⁷ / ₁₆ | | | 10 ³ / ₈ | 1 ⁹ / ₁₆ |
| 42 | | 30 ¹ / ₈ | | | 11 ¹ / ₂ | 2 ⁹ / ₁₆ |
| 48 | 60,000 | 33 ¹ / ₂ | 16 ¹ / ₄ | 10 ¹³ / ₁₆ | 13 ³ / ₄ | 2 ³ / ₁₆ |

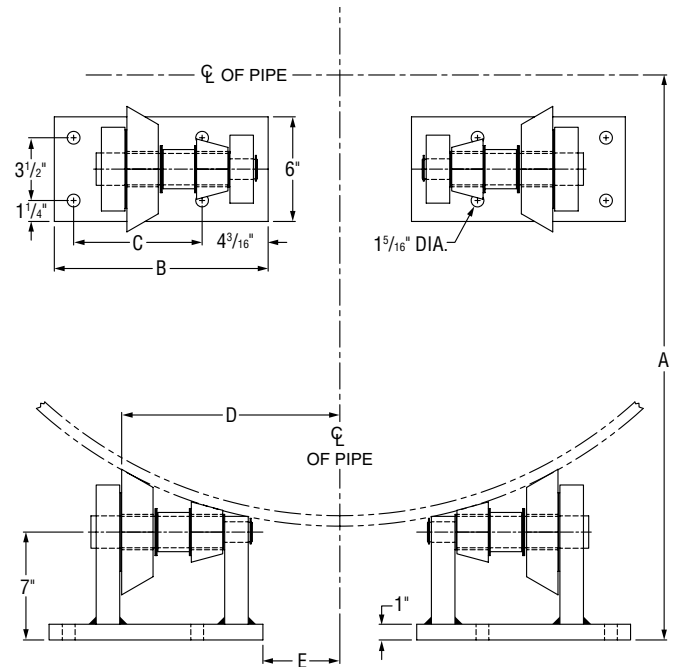
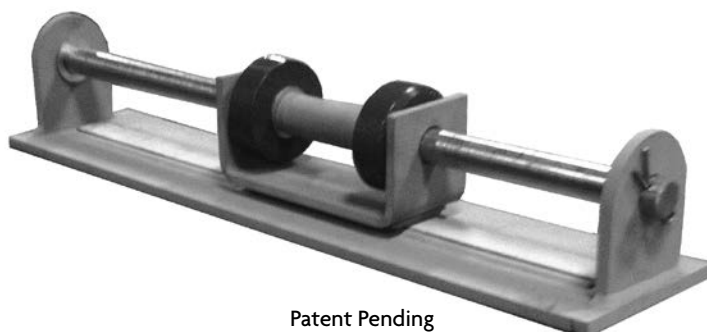


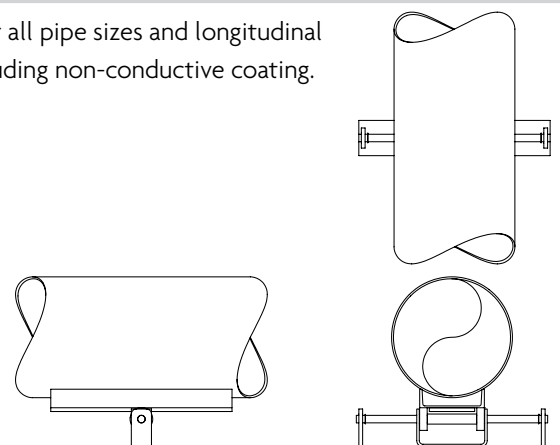
Fig. 75LL

Longitudinal & Lateral Roller

Description: This product is a special design per customer requirements. For all pipe sizes and longitudinal and lateral movements. Available in plain, galvanized and resilient finish including non-conductive coating.



Patent Pending



Pipe Covering Protection Saddle For Nominal Thickness of Covering Shown

Fig. 160: 1"

Fig. 163: 2½"

Fig. 165A: 4" (Alloy)

Fig. 161: 1½"

Fig. 164: 3"

Fig. 166A: 5½" (Alloy)

Fig. 162: 2"

Fig. 165: 4"

Size Range: ¾" through 36"

Material:

- Figs. 160, 161, 162, 163, 164, and 165 are curved carbon steel plate.
- Figs. 165A and 166A are alloy steel manufactured from ASTM A 387 Grade 22 Chrome Molybdenum steel plate.
- Figs. 165A and 166A have a welded-in center plate in all sizes.
- All other saddles have a welded-in center plate for pipe sizes 12" and larger.
- All saddles are 12" long with side edges turned up.

Finish: Plain

Service: Designed for use on insulated high temperature systems where heat losses are to be kept to a minimum and to protect insulation against damage.

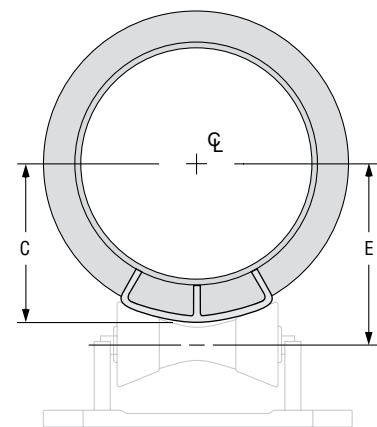
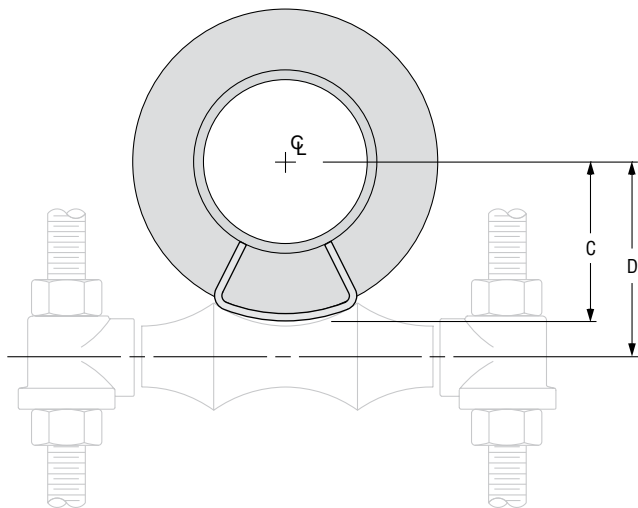
Maximum Temperature: 650° F carbon steel, 950° F alloy steel.

Approvals: Complies with Federal Specification A-A-1192A (Type 39A & 39B), WW-H-171-E (Type 40A & 40B), ANSI/MSS SP-69 and MSS SP-58 (Type 39A & 39B).

Features: Permits finished, weather tight covering at all points of pipe support.

Ordering: Specify pipe size, figure number and name. Data for 42" size available on request.

Installation: It is recommended that saddle be welded to the pipe.



Continued on Following Page.

Fig. 160 to Fig 166A

Pipe Covering Protection Saddle (cont.)

FIG. 160, 161, 162, 163, 164, 165, 165A, 166A: DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS)

| Pipe Size | Fig. No. | Max Load ■ | Weight | Size of Pipe Roll | | | Center Line of Pipe to Outside of Saddle C | Center Line of Pipe to Center Line of Roll | | |
|-----------|----------|------------|--------|---------------------|----------|---------------------|--|--|----------|---------------------|
| | | | | Figs. 171, 175, 177 | Fig. 181 | Figs. 271, 274, 277 | | D | | E |
| | | | | | | | | Figs. 171, 175, 177 | Fig. 181 | Figs. 271, 274, 277 |
| ¾ | 160• | 1,200 | 1.4 | 2 | 2½ | 2-3½ | 1⅝ | 2¼ | 2½ | 2¼ |
| | 161• | | 2.1 | 3 | 3½ | | 2⅜ | 2¾ | 2¾ | 2⅞ |
| | 162• | | 2.8 | 4 | 5 | | 2⅞ | 3⅞ | 3⅞ | 3⅞ |
| 1 | 160• | 1,200 | 1.4 | 2½ | 3 | 2-3½ | 1⅞ | 2⅞ | 2¼ | 2⅞ |
| | 161• | | 2.1 | 3 | 4 | | 2⅞ | 2⅞ | 2⅞ | 3 |
| | 162• | | 2.8 | 4 | 5 | | 2⅞ | 3½ | 3½ | 3½ |
| 1¼ | 160 | 1,200 | 1.4 | 2½ | 3 | 2-3½ | 1⅞ | 2½ | 2⅞ | 2⅞ |
| | 161• | | 2.1 | 3½ | 5 | | 2⅞ | 3⅞ | 3⅞ | 3⅞ |
| | 162• | | 2.8 | 4 | | | 3 | 3⅞ | 3⅞ | 3⅞ |
| | 163• | | 3.6 | 5 | 6 | 4-6 | 3¾ | 4⅞ | 4⅞ | 4⅞ |
| 1½ | 160 | 1,200 | 1.5 | 3 | 3½ | 2-3½ | 2⅞ | 2⅞ | 2⅞ | 2⅞ |
| | 161• | | 2.1 | 3½ | 5 | | 2⅞ | 3¼ | 3¼ | 3⅞ |
| | 162• | | 3.2 | 5 | 6 | 4-6 | 3⅞ | 4 | 4 | 3⅞ |
| | 163• | | 3.6 | 6 | 8 | | 3⅞ | 4½ | 4⅞ | 4½ |
| 2 | 160 | 1,200 | 1.7 | 3½ | 4 | 2-3½ | 2⅞ | 3 | 2⅞ | 3⅞ |
| | 161• | | 2.3 | 4 | 5 | | 2⅞ | 3½ | 3½ | 3⅞ |
| | 162• | | 3.2 | 5 | 6 | 4-6 | 3⅞ | 4¼ | 4¼ | 4⅞ |
| | 163• | | 3.6 | 6 | 8 | | 4⅞ | 4¾ | 4⅞ | 4¾ |
| | 164• | | 4.5 | 8 | | | 4⅞ | 5⅞ | 5⅞ | 5¼ |
| 2½ | 160 | 1,200 | 1.7 | 3½ | 5 | 2-3½ | 2⅞ | 3¼ | 3¼ | 3⅞ |
| | 161 | | 2.8 | 5 | 6 | | 3⅞ | 4 | 4 | 3⅞ |
| | 162 | | 3.2 | 6 | 8 | 4-6 | 3⅞ | 4½ | 4⅞ | 4½ |
| | 163 | | 4.1 | 8 | | | 4¼ | 5⅞ | 5⅞ | 5 |
| | 164 | | 4.5 | | | | 10 | 4⅞ | 5⅞ | 5¼ |
| 3 | 160 | 1,200 | 1.9 | 4 | 5 | 2-3½ | 2⅞ | 3½ | 3½ | 3⅞ |
| | 161 | | 2.8 | 5 | 6 | | 3⅞ | 4⅞ | 4⅞ | 4¼ |
| | 162 | | 3.6 | 6 | 8 | 4-6 | 4⅞ | 4⅞ | 4⅞ | 4⅞ |
| | 163 | | 4.1 | 8 | | | 4⅞ | 5⅞ | 5⅞ | 5⅞ |
| | 164 | | 4.9 | | | | 10 | 8-10 | 5⅞ | 6 |
| 3½ | 160 | 1,200 | 2.3 | 5 | 6 | 4-6 | 3⅞ | 4 | 4 | 3⅞ |
| | 161 | | 3.2 | 6 | 8 | | 3⅞ | 4⅞ | 4⅞ | 4½ |
| | 162 | | 3.6 | 8 | | | 4⅞ | 5⅞ | 5⅞ | 5 |
| | 163 | | 4.5 | | 10 | 4⅞ | 5⅞ | 5⅞ | 5⅞ | |
| | 164 | | 4.9 | | | 10 | 8-10 | 5⅞ | 6⅞ | 6⅞ |
| 4 | 160 | 1,200 | 2.3 | 5 | 6 | 4-6 | 3⅞ | 4¼ | 4¼ | 4⅞ |
| | 161 | | 3.2 | 6 | 8 | | 4⅞ | 4⅞ | 4⅞ | 4¾ |
| | 162 | | 3.6 | 8 | | | 4⅞ | 5⅞ | 5⅞ | 5¼ |
| | 163 | | 4.5 | | 10 | 5 | 5⅞ | 5⅞ | 6 | |
| | 164 | | 4.9 | | | 10 | 5⅞ | 6⅞ | 6⅞ | 6⅞ |
| | 165 | | 6.1 | 12 | 12-14 | | 6½ | 7⅞ | 7⅞ | 7⅞ |
| | 165A | 11.6 | 8⅞ | | | 9⅞ | 9½ | 9⅞ | | |
| 166A | 15.7 | 14 | 16 | 8⅞ | 9⅞ | 9½ | 9⅞ | | | |

- Maximum recommended loads are applicable only when saddle is used on a flat bearing surface or roller hangers and tack welded to pipe. When saddle is used with a pipe roll, the maximum load for the assembly is the smaller of the two loads.
- Saddles may require notching when used with a U-bolt.

Continued on Following Page.

PIPE ROLLS & SADDLES

Fig. 160 to Fig 166A Pipe Covering Protection Saddle (cont.)

| FIG. 160, 161, 162, 163, 164, 165, 165A, 166A: DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS) | | | | | | | | | | |
|---|----------|------------|---------------------------------|---------------------|----------|---------------------------------|--|--|----------------------------------|----------------------------------|
| Pipe Size | Fig. No. | Max Load ■ | Weight | Size of Pipe Roll | | | Center Line of Pipe to Outside of Saddle C | Center Line of Pipe to Center Line of Roll | | |
| | | | | Figs. 171, 175, 177 | Fig. 181 | Figs. 271, 274, 277 | | D | | E |
| | | | | | | | | Figs. 171, 175, 177 | Fig. 181 | Figs. 271, 274, 277 |
| 5 | 160 | 1,200 | 2.3 | 6 | 8 | 4-6 | 4 ¹ / ₈ | 4 ¹³ / ₁₆ | 4 ¹³ / ₁₆ | 4 ³ / ₄ |
| | 161 | | 3.2 | 8 | | | 4 ¹ / ₁₆ | 5 ¹ / ₂ | 5 ¹ / ₂ | 5 ³ / ₈ |
| | 162 | | 3.6 | 10 | 10 | 8-10 | 5 ³ / ₁₆ | 6 | 6 ¹ / ₁₆ | 6 ¹ / ₈ |
| | 163 | | 4.5 | | | | 5 ⁵ / ₈ | 6 ⁹ / ₁₆ | 6 ⁹ / ₁₆ | 6 ⁵ / ₈ |
| | 164 | | 4.9 | 12 | 14 | 12-14 | 6 ³ / ₁₆ | 7 ¹ / ₈ | 7 ¹ / ₄ | 7 ¹ / ₄ |
| | 165 | | 6.1 | | | | 8 ³ / ₁₆ | 8 ³ / ₈ | 8 ³ / ₁₆ | |
| | 165A | 11.6 | 16 | 18 | 16-20 | 8 ¹ / ₁₆ | 10 ¹ / ₁₆ | 10 ¹ / ₁₆ | 9 ⁷ / ₈ | |
| | 166A | 15.7 | | | | 8 ¹ / ₈ | 10 ¹ / ₁₆ | 10 ¹ / ₁₆ | 9 ⁷ / ₈ | |
| 6 | 160 | 1,800 | 3.8 | 8 | 8 | 4-6 | 4 ¹ / ₂ | 5 ³ / ₈ | 5 ³ / ₈ | 5 ¹ / ₄ |
| | 161 | | 4.4 | 10 | 8-10 | 5 ¹ / ₁₆ | 5 ⁷ / ₈ | 5 ¹¹ / ₁₆ | 6 | |
| | 162 | | 5.7 | 12 | 16 | 12-14 | 5 ¹ / ₂ | 6 ⁷ / ₁₆ | 6 ⁷ / ₁₆ | 6 ¹ / ₂ |
| | 163 | | 6.5 | | | | 6 ³ / ₁₆ | 7 ¹ / ₈ | 7 ³ / ₁₆ | 7 ¹ / ₄ |
| | 164 | | 7.7 | 14 | 16 | 16-20 | 6 ⁹ / ₁₆ | 7 ⁵ / ₈ | 7 ⁵ / ₈ | 7 ⁵ / ₈ |
| | 165 | | 10.2 | | | | 7 ⁹ / ₁₆ | 9 | 9 | 8 ³ / ₄ |
| | 165A | 12.9 | 16 | 18 | 16-20 | 7 ⁵ / ₈ | 9 ¹ / ₈ | 10 ⁹ / ₁₆ | 10 ⁷ / ₁₆ | |
| | 166A | 16.3 | | | | 9 ¹ / ₈ | 10 ⁵ / ₈ | 10 ⁹ / ₁₆ | 10 ⁷ / ₁₆ | |
| 8 | 161 | 1,800 | 5.8 | 10 | 12 | 8-10 | 6 | 7 ¹ / ₁₆ | 7 ¹ / ₁₆ | 7 ¹ / ₁₆ |
| | 162 | | 6.3 | 14 | 16 | 12-14 | 6 ¹ / ₂ | 7 ⁹ / ₁₆ | 7 ⁹ / ₁₆ | 7 ⁹ / ₁₆ |
| | 163 | | 7.2 | | | | 7 ¹ / ₄ | 8 ⁵ / ₁₆ | 8 ¹ / ₂ | 8 ⁵ / ₁₆ |
| | 164 | | 7.7 | 16 | 18 | 16-20 | 7 ¹ / ₁₆ | 9 | 9 | 8 ³ / ₄ |
| | 165 | | 10.2 | | | | 8 ¹ / ₁₆ | 10 ¹ / ₈ | 10 ¹ / ₈ | 9 ⁷ / ₈ |
| | 165A | 16.9 | 18 | 20 | 16-20 | 10 ¹ / ₄ | 11 ⁷ / ₈ | 11 ¹³ / ₁₆ | 11 ⁵ / ₈ | |
| | 166A | 22.6 | | | | 10 ¹ / ₄ | 11 ⁷ / ₈ | 11 ¹³ / ₁₆ | 11 ⁵ / ₈ | |
| 10 | 161 | 1,800 | 5.8 | 12 | 14 | 8-10 | 7 ¹ / ₄ | 8 ⁵ / ₁₆ | 8 ¹ / ₂ | 8 ⁵ / ₁₆ |
| | 162 | | 7.7 | 14 | 16 | 12-14 | 7 ⁵ / ₈ | 9 ¹ / ₁₆ | 9 | 8 ¹³ / ₁₆ |
| | 163 | | 8.2 | | | | 8 ¹ / ₈ | 9 ⁹ / ₁₆ | 9 ⁹ / ₁₆ | 9 ⁵ / ₁₆ |
| | 164 | | 8.8 | 16 | 18 | 16-20 | 8 ¹ / ₁₆ | 10 ¹ / ₈ | 10 ¹ / ₁₆ | 10 |
| | 165 | | 10.8 | | | | 9 ³ / ₄ | 11 ¹ / ₄ | 11 ¹ / ₄ | 11 ¹ / ₈ |
| | 165A | 18.9 | 18 | 20 | 22-24 | 9 ¹ / ₁₆ | 11 ⁵ / ₁₆ | 11 ⁵ / ₁₆ | 11 ⁵ / ₁₆ | |
| | 166A | 24.3 | | | | 11 ¹ / ₈ | 12 ¹⁵ / ₁₆ | 12 ¹⁵ / ₁₆ | 12 ¹⁵ / ₁₆ | |
| 12 | 161 | 5,000 | 7.8 | 14 | 16 | 12-14 | 8 ¹ / ₁₆ | 9 ¹ / ₂ | 9 ¹ / ₂ | 9 ¹ / ₄ |
| | 162 | | 9.9 | 16 | 18 | 16-20 | 8 ⁵ / ₈ | 10 ³ / ₁₆ | 10 ¹ / ₁₆ | 10 |
| | 163 | | 10.5 | | | | 9 ¹ / ₈ | 10 ¹ / ₁₆ | 10 ⁹ / ₁₆ | 10 ¹ / ₂ |
| | 164 | | 11.4 | 18 | 20 | 16-20 | 9 ⁵ / ₈ | 11 ¹ / ₈ | 11 ¹ / ₈ | 11 |
| | 165 | | 14.0 | | | | 10 ¹³ / ₁₆ | 12 ³ / ₈ | 12 ³ / ₈ | 12 ³ / ₁₆ |
| | 165A | | 28.0 | 20 | 24 | 22-24 | 11 | 12 ¹ / ₂ | 12 ¹ / ₂ | 12 ³ / ₈ |
| | 166A | 35.5 | 12 ⁵ / ₁₆ | | | | 14 ¹ / ₄ | 14 ¹ / ₄ | 13 ¹¹ / ₁₆ | |
| | 14 | 161 | 5,000 | 7.8 | 16 | 18 | 12-14 | 8 ³ / ₄ | 10 ³ / ₁₆ | 10 ¹ / ₈ |
| 162 | | 9.9 | | 16 | 18 | 16-20 | 9 ⁵ / ₁₆ | 10 ⁷ / ₈ | 10 ¹³ / ₁₆ | 10 ¹¹ / ₁₆ |
| 163 | | 10.5 | | | | | 9 ⁷ / ₈ | 11 ⁵ / ₁₆ | 11 ³ / ₈ | 11 ³ / ₁₆ |
| 164 | | 11.4 | | 18 | 20 | 16-20 | 10 ⁹ / ₁₆ | 11 ³ / ₄ | 11 ³ / ₄ | 11 ⁵ / ₈ |
| 165 | | 14.0 | | | | | 11 ⁵ / ₁₆ | 12 ⁷ / ₈ | 12 ⁷ / ₈ | 12 ² / ₈ |
| 165A | | 27.6 | 20 | 24 | 22-24 | 11 ⁹ / ₁₆ | 13 ¹ / ₁₆ | 13 ¹ / ₁₆ | 12 ⁷ / ₈ | |
| 166A | | 35.5 | | | | 12 ⁷ / ₈ | 14 ³ / ₄ | 14 ³ / ₄ | 14 ¹ / ₄ | |

- Maximum recommended loads are applicable only when saddle is used on a flat bearing surface or roller hangers and tack welded to pipe. When saddle is used with a pipe roll, the maximum load for the assembly is the smaller of the two loads.
- Saddles may require notching when used with a U-bolt.

Continued on Following Page.

Fig. 160 to Fig 166A

Pipe Covering Protection Saddle (cont.)

| FIG. 160, 161, 162, 163, 164, 165, 165A, 166A: DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS) | | | | | | | | | | | |
|---|----------|------------|---------------------------------|---------------------|----------------|----------------------------------|--|--|---------------------------------|----------------------------------|--|
| Pipe Size | Fig. No. | Max Load ■ | Weight | Size of Pipe Roll | | | Center Line of Pipe to Outside of Saddle C | Center Line of Pipe to Center Line of Roll | | | |
| | | | | Figs. 171, 175, 177 | Figs. 174, 181 | Figs. 271, 274, 277 | | D | | E | |
| | | | | | | | | Figs. 171, 175, 177 | Fig. 181 | Figs. 271, 274, 277 | |
| 16 | 161 | 5,000 | 8.4 | 18 | 20 | 16-20 | 9 ³ / ₁₆ | 11 ¹ / ₄ | 11 ¹ / ₄ | 11 ¹ / ₈ | |
| | 162 | | 10.4 | | | | 10 ⁹ / ₁₆ | 11 ³ / ₁₆ | 11 ³ / ₄ | 11 ⁹ / ₁₆ | |
| | 163 | 7,200 | 11.1 | 20 | - | - | 10 ¹³ / ₁₆ | 12 ⁵ / ₁₆ | - | 12 ³ / ₁₆ | |
| | 164 | | 13.3 | | | | 11 ¹ / ₁₆ | 12 ⁷ / ₈ | - | 12 ⁷ / ₁₆ | |
| | 165 | | 15.3 | | | | 12 ³ / ₁₆ | 14 ¹ / ₈ | - | 13 ⁵ / ₈ | |
| | 165A | 11,140 | 30.1 | 24 | - | 22-24 | 12 ⁷ / ₁₆ | 14 ⁵ / ₁₆ | - | 13 ³ / ₈ | |
| | 166A | | 40.0 | | | | 13 ¹³ / ₁₆ | 16 ⁵ / ₈ | - | 15 ⁵ / ₈ | |
| 18 | 161 | 5,000 | 9.1 | 20 | - | 16-20 | 10 ¹³ / ₁₆ | 12 ⁵ / ₁₆ | - | 12 ³ / ₁₆ | |
| | 162 | 7,200 | 10.4 | | | | 11 ⁵ / ₁₆ | 12 ⁷ / ₈ | - | 12 ¹¹ / ₁₆ | |
| | 163 | | 12.4 | 24 | - | 22-24 | 11 ⁵ / ₈ | 13 ⁹ / ₁₆ | - | 13 ¹ / ₁₆ | |
| | 164 | | 13.3 | | | | 12 ¹ / ₄ | 14 ³ / ₁₆ | - | 13 ⁵ / ₈ | |
| | 165 | 15.3 | 13 ⁵ / ₁₆ | | | | 15 ¹ / ₄ | - | 14 ³ / ₄ | | |
| | 165A | 13,370 | 40.3 | 30 | - | 26-30 | 13 ³ / ₄ | 15 ¹ / ₁₆ | - | 15 ¹ / ₈ | |
| | 166A | | 52.1 | | | | 14 ⁷ / ₈ | 17 ⁵ / ₈ | - | 16 ⁵ / ₈ | |
| 20 | 161 | 7,200 | 10.4 | 24 | - | 22-24 | 11 ⁵ / ₈ | 13 ⁹ / ₁₆ | - | 13 ¹ / ₁₆ | |
| | 162 | | 11.6 | | | | 12 ¹ / ₄ | 14 ¹ / ₈ | - | 13 ⁵ / ₈ | |
| | 163 | | 12.4 | | | | 12 ³ / ₄ | 14 ¹ / ₁₆ | - | 14 ³ / ₁₆ | |
| | 164 | 13.4 | 30 | - | 26-30 | 13 ⁵ / ₁₆ | 15 ¹ / ₄ | - | 14 ³ / ₄ | | |
| | 165 | 22.8 | | | | 14 ¹ / ₈ | 17 | - | 15 ⁵ / ₈ | | |
| | 165A | 44.8 | | | | 14 ³ / ₈ | 17 ³ / ₁₆ | - | 16 ¹ / ₈ | | |
| | 166A | 52.1 | | | | 16 ¹ / ₈ | 18 ⁵ / ₁₆ | - | 17 ⁷ / ₈ | | |
| 24 | 161 | 7,200 | 12.3 | 30 | - | 26-30 | 13 ¹ / ₂ | 16 ⁵ / ₁₆ | - | 15 ¹ / ₄ | |
| | 162 | | 13.4 | | | | 14 | 16 ⁷ / ₈ | - | 15 ³ / ₄ | |
| | 163 | | 14.3 | | | | 14 ⁵ / ₈ | 17 ¹ / ₂ | - | 16 ⁷ / ₁₆ | |
| | 164 | 20.3 | 13,370 | - | - | 15 ¹ / ₄ | 18 ¹ / ₁₆ | - | 17 | | |
| | 165 | 23.1 | | | | 16 ⁷ / ₁₆ | 19 ¹ / ₄ | - | 18 ³ / ₁₆ | | |
| | 165A | 45.4 | | | | 16 ¹ / ₁₆ | 19 ¹ / ₂ | - | 18 ⁷ / ₁₆ | | |
| | 166A | 52.1 | | | | 18 | - | - | 19 ³ / ₄ | | |
| 30 | 161 | 7,200 | 13.3 | - | - | 36-42 | 16 ¹⁵ / ₁₆ | - | - | 18 ⁷ / ₈ | |
| | 162 | | 14.0 | | | | 17 ¹ / ₂ | - | - | 19 ⁹ / ₈ | |
| | 163 | | 20.0 | | | | 18 ¹ / ₁₆ | - | - | 19 ¹⁵ / ₁₆ | |
| | 164 | 21.4 | 13,370 | - | - | 18 ⁵ / ₈ | - | - | 20 ¹ / ₂ | | |
| | 165 | 24.0 | | | | 19 ¹¹ / ₁₆ | - | - | 21 ¹ / ₂ | | |
| | 165A | 47.9 | | | | 19 ¹⁵ / ₁₆ | - | - | 21 ³ / ₄ | | |
| | 166A | 55.6 | | | | 21 ¹ / ₂ | - | - | 23 ³ / ₈ | | |
| 36 | 161 | 7,200 | 18.0 | - | - | 36-42 | 20 ¹ / ₄ | - | - | 22 ¹ / ₈ | |
| | 162 | | 18.9 | | | | 20 ¹⁵ / ₁₆ | - | - | 22 ⁵ / ₈ | |
| | 163 | | 20.2 | | | | 21 ⁵ / ₁₆ | - | - | 23 ³ / ₁₆ | |
| | 164 | 21.6 | 13,370 | - | - | 21 ⁷ / ₈ | - | - | 23 ¹ / ₁₆ | | |
| | 165 | 24.1 | | | | 22 ⁷ / ₈ | - | - | 24 ¹ / ₁₆ | | |
| | 165A | 48.3 | | | | 23 ¹ / ₈ | - | - | 25 | | |
| | 166A | 55.8 | | | | 24 ⁵ / ₈ | - | - | 26 ¹ / ₂ | | |

- Maximum recommended loads are applicable only when saddle is used on a flat bearing surface or roller hangers and tack welded to pipe. When saddle is used with a pipe roll, the maximum load for the assembly is the smaller of the two loads.
- Saddles may require notching when used with a U-bolt.

Fig. 45

Channel Assembly

Material: Carbon steel

Finish: Plain or Hot-Dip Galvanized

Ordering: Fig. 45 channel assembly; channel size, rod size, name, finish and C to C. Note: that $L = (C \text{ to } C) + 2M + W$

Note: Can also be used with a U-bolt Fig. 137 & Fig. 60 washer plates to secure pipe to the center of channel assembly.

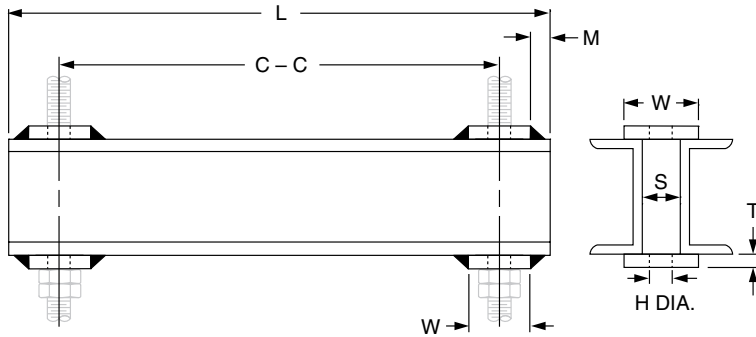
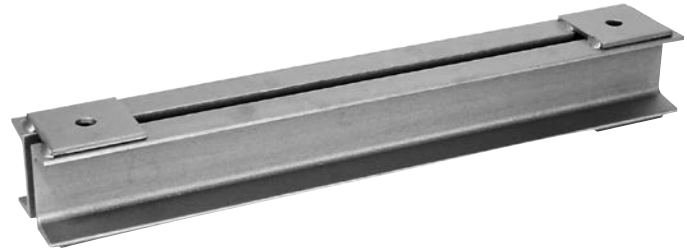


FIG. 45: DIMENSIONS (IN)

| Rod Dia | 3/8 | 1/2 | 5/8 | 3/4 | 7/8 | 1 | 1 1/4 | 1 1/2 | 1 3/4 | 2 | 2 1/4 | 2 1/2 | 2 3/4 | 3 | 3 1/4 | 3 1/2 |
|---------|------|--------|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| H Hole | 1/2 | 5/8 | 3/4 | 7/8 | 1 | 1 1/4 | 1 1/2 | 1 3/4 | 2 | 2 1/4 | 2 1/2 | 2 3/4 | 3 | 3 1/4 | 3 1/2 | 3 3/4 |
| S | 9/16 | 1 1/16 | 1 3/16 | 1 5/16 | 1 7/16 | 1 3/8 | 1 5/8 | 1 7/8 | 2 1/4 | 2 1/2 | 2 3/4 | 3 | 3 1/4 | 3 1/2 | 3 3/4 | 4 |
| W | 3 | 3 | 3 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 7 |
| T | 1/4 | 1/4 | 3/8 | 3/8 | 1/2 | 1/2 | 1/2 | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 |
| M | 3/8 | 3/8 | | | 3/8 | 3/8 | 3/8 | 3/8 | 3/8 | 3/8 | 3/8 | 3/8 | 3/8 | 3/8 | 3/8 | 1/2 |

FIG. 45: WEIGHTS (LBS) • LOADS (LBS) • C TO C = SPAN (IN)

| Size | Wt./Ft. 2C's | Maximum Load (lbs); Based on C to C Dimensions at Max Temperature of 250° F | | | | | | | | | | | | | | | |
|------|--------------|---|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|--------|--------|--------|--------|--|
| | | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30 | 36 | 42 | 48 | 54 | 60 | |
| 3 | 8.2 | 8,800 | 7,500 | 6,600 | 5,800 | 5,200 | 4,800 | 4,400 | 3,900 | 3,600 | 3,500 | 2,900 | 2,500 | 2,200 | 1,900 | 1,700 | |
| 4 | 10.8 | 15,200 | 13,100 | 11,400 | 10,200 | 9,100 | 8,300 | 7,500 | 7,000 | 6,500 | 6,100 | 5,100 | 4,300 | 3,800 | 3,300 | 3,000 | |
| 5 | 13.4 | - | - | - | 16,000 | 14,400 | 13,100 | 12,000 | 11,100 | 10,300 | 9,600 | 8,000 | 6,800 | 6,000 | 5,300 | 4,800 | |
| 6 | 21.0 | - | - | - | 26,600 | 24,000 | 21,800 | 20,000 | 18,400 | 17,100 | 16,000 | 13,300 | 11,400 | 10,000 | 8,800 | 8,000 | |
| 8 | 23.0 | - | - | - | - | - | - | 32,300 | 29,800 | 27,700 | 25,800 | 21,500 | 18,500 | 16,100 | 14,300 | 12,900 | |
| 10 | 30.6 | - | - | - | - | - | - | 53,500 | 49,400 | 45,800 | 42,800 | 35,700 | 30,600 | 26,700 | 23,800 | 21,400 | |
| 12 | 41.4 | - | - | - | - | - | - | - | - | - | - | 57,000 | 48,900 | 42,800 | 38,000 | 34,200 | |
| 15 | 67.8 | - | - | - | - | - | - | - | - | - | - | 111,000 | 95,300 | 83,400 | 74,100 | 66,700 | |

Fig. 46

Universal Trapeze Assembly

Material: Carbon steel

Finish: Plain or Hot-Dip Galvanized

Service: Trapeze assembly is to be suspended by two rods with Fig. 60 washer plates and is designed for top loading exclusively.

Ordering: Specify size number, figure number, name, finish, C to C dimension and hole size "H". If holes "J" or hole "D" are required, also specify hole size and dimensions "K" and "M" or "B".

Note: Larger C to C dimensions are available upon request.

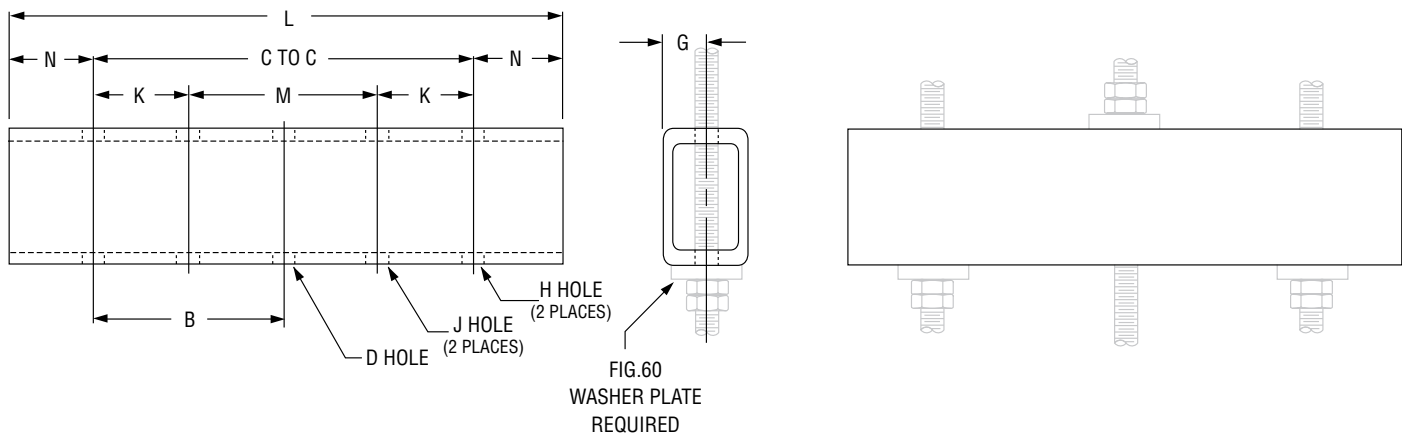


FIG. 46: DIMENSIONS (IN) • WEIGHT (LBS)

| Size | Size Tubing | Weight | Max Hole Dia. H, J, D | G | N | C to C = Span (in) | | | | | | | | | | | | | | |
|------|-------------|--------|-----------------------|----|----|--------------------|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | | | | | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30 | 36 | 42 | 48 | 54 | 60 |
| | | | | | | L (in) | | | | | | | | | | | | | | |
| 1 | ¼ x 2 x 2 | 5.40 | 1½ | 1 | 1½ | 15 | 17 | 19 | 21 | 23 | 25 | 27 | 29 | 31 | 33 | 39 | - | - | - | - |
| 2 | ¼ x 3 x 2 | 7.10 | | | | - | - | - | 23¼ | 25¼ | 27¼ | 29¼ | 31¼ | 33¼ | 35¼ | 41¼ | 47¼ | 53¼ | 59¼ | 65¼ |
| 3 | ⅜ x 4 x 3 | 8.14 | 1½ | 1½ | 2½ | - | - | - | 23 | 25 | 27 | 29 | 31 | 33 | 35 | 41 | 47 | 53 | 59 | 65 |
| 4 | ¼ x 4 x 4 | 12.00 | 1⅞ | 2 | 2⅝ | - | - | - | 23¼ | 25¼ | 27¼ | 29¼ | 31¼ | 33¼ | 35¼ | 41¼ | 47¼ | 53¼ | 59¼ | 65¼ |
| 5 | ¼ x 6 x 4 | 15.42 | 2⅜ | | 3⅜ | - | - | - | - | - | - | 30¼ | 32¼ | 34¼ | 36¼ | 42¼ | 48¼ | 54¼ | 60¼ | 66¼ |
| 6 | ¼ x 8 x 4 | 18.80 | 2⅞ | | 4 | - | - | - | - | - | - | 32 | 34 | 36 | 38 | 44 | 50 | 56 | 62 | 68 |

FIG. 46: MAXIMUM LOAD (LBS); BASED ON C TO C DIMENSIONS AT MAX TEMPERATURE OF 250° F

| Size | FIG. 46: MAXIMUM LOAD (LBS); BASED ON C TO C DIMENSIONS AT MAX TEMPERATURE OF 250° F | | | | | | | | | | | | | | |
|------|--|-------|-------|--------|-------|-------|--------|--------|--------|--------|--------|--------|--------|-------|-------|
| | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30 | 36 | 42 | 48 | 54 | 60 |
| 1 | 2,600 | 2,300 | 1,900 | 1,700 | 1,500 | 1,400 | 1,300 | 1,200 | 1,100 | 1,000 | 8,80 | - | - | - | - |
| 2 | 6,700 | 5,700 | 5,000 | 4,500 | 4,000 | 3,600 | 3,300 | 3,100 | 2,800 | 2,700 | 2,200 | - | - | - | - |
| 3 | - | - | - | 5,800 | 5,200 | 4,800 | 4,400 | 3,900 | 3,600 | 3,500 | 2,900 | 2,500 | 2,200 | 1,900 | 1,700 |
| 4 | - | - | - | 10,200 | 9,100 | 8,300 | 7,500 | 7,000 | 6,500 | 6,100 | 5,100 | 4,300 | 3,800 | 3,300 | 3,000 |
| 5 | - | - | - | - | - | - | 12,000 | 11,100 | 10,300 | 9,600 | 8,000 | 6,800 | 6,000 | 5,300 | 4,800 |
| 6 | - | - | - | - | - | - | 20,000 | 18,400 | 17,100 | 16,000 | 13,300 | 11,400 | 10,000 | 8,800 | 8,000 |

Fig. 50

Equal Leg Angle for Trapeze Assembly

Material: Carbon steel

Finish: Plain or Hot-Dip Galvanized

Ordering:

If two holes "H" are required:

Specify Fig. 50 angle
(nominal size, C to C, H, total weight and load)

If two holes "H" and hole "D" are required:

Specify Fig. 50 angle
(nominal size, B, C to C, D, H, total weight and load)

If two holes "H" and two holes "J" are required:

Specify Fig. 50 angle
(nominal size, C to C, H, J, K, M, total weight and load)

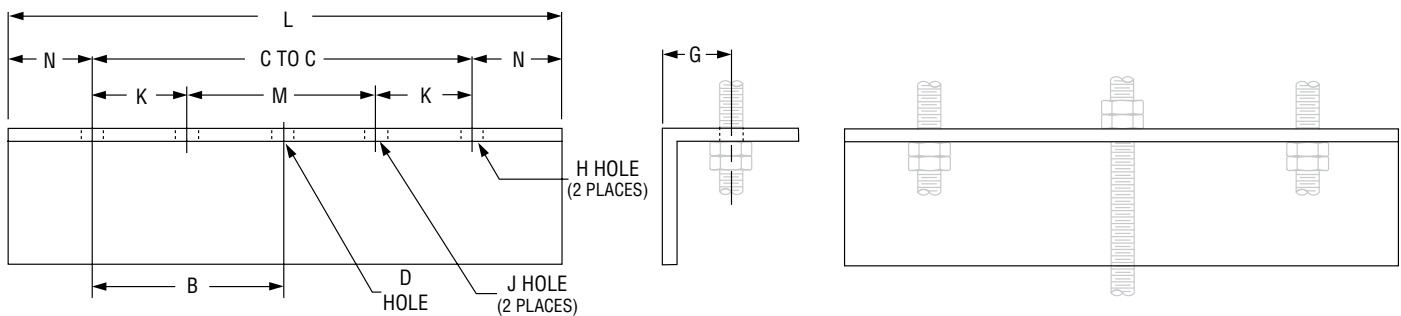


FIG. 50: DIMENSIONS (IN) • LOAD (LBS) • WEIGHT (LBS)

| Size | Weight Per/Ft | G | N | Max Rod Size H | C to C = Span in Inches | | | | | | | | | | |
|--------|---------------|----|----|----------------|--|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|
| | | | | | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 28 | 30 |
| | | | | | Maximum Load; Based on C to C Dimensions at Max Temperature of 250°F | | | | | | | | | | |
| 1½ x ¼ | 2.34 | ¾ | 1¼ | ½ | 780 | 624 | 520 | 446 | 390 | 346 | 312 | 284 | 260 | 223 | 208 |
| 2 x ¼ | 3.19 | 1⅝ | 1½ | ⅝ | 1,500 | 1,200 | 1,000 | 856 | 750 | 667 | 600 | 545 | 500 | 428 | 400 |
| 2 x ⅜ | 4.70 | | | ¾ | 2,100 | 1,680 | 1,400 | 1,200 | 1,050 | 933 | 840 | 763 | 700 | 600 | 560 |
| 2½ x ⅜ | 5.90 | 1⅜ | | 1 | 3,420 | 2,736 | 2,280 | 1,954 | 1,710 | 1,520 | 1,368 | 1,244 | 1,140 | 977 | 912 |
| 3 x ⅜ | 7.20 | 1¾ | 1¾ | 1¼ | 4,980 | 3,984 | 3,320 | 2,846 | 2,490 | 2,130 | 1,992 | 1,810 | 1,660 | 1,423 | 1,328 |
| 3 x ½ | 9.40 | | | | 6,600 | 5,280 | 4,400 | 3,772 | 3,300 | 2,933 | 2,640 | 2,400 | 2,200 | 1,886 | 1,760 |
| 4 x ½ | 12.80 | 2½ | | | 2 | 2 | 12,000 | 9,600 | 8,000 | 6,858 | 6,000 | 5,333 | 4,800 | 4,364 | 4,000 |

SPRING HANGERS

Fig. 82, Fig. B-268, Fig. 98, Triple Spring, and Quadruple Spring Fig. C-82, Fig. C-268, Fig. C-98, Triple-CR, and Quadruple-CR Spring (Corrosion Resistant)

Design features:

- Precompression.
Precompressing the spring into the hanger casing provides the following advantages:
 - (1) Saves up to 50% in headroom by reducing the length of the hanger.
 - (2) Reduces the installed height of the overall hanger assembly.
 - (3) Prevents the spring supporting force from exceeding the normal safe limits of variations.
 - (4) Saves valuable erection time because spring is precompressed close to $\frac{1}{2}$ " of the working range.
- Calibration: all Anvil Variable Spring Hangers and supports are calibrated for accurate loading conditions.
- Load indicator is clearly seen in the slot, simplifying reading of the scale plate. Load is read from bottom of indicator.
- Cold set at the factory upon request.
- Spring and casing are fabricated of steel and are rugged and compact.
- Piston cap serves as a centering device or guide maintaining spring alignment.
- Casing protects the spring from damage and weather conditions.

Standard Finish: Painted with semi-gloss primer.

Corrosion Resistant: Anvil offers corrosion-resistant and weather-resistant Variable Spring Hangers to fill vital needs in the chemical and refinery industries as well as in modern outdoor power plant construction. For protection against severe weather conditions or moderate corrosive conditions, the parts of the hanger are galvanized per ASTM A-153, except the spring which has a protective coating and the load column for Type F which is electro-galvanized.

Advantages of a Protective Coating:

- Protects from a wide range of corrosives.
- Does not affect the flex life of the spring.
- Recommended for ambient temperatures up to 200° F

Travel stop: The functional design of the pre-compressed variable spring hanger permits the incorporation of a two-piece travel stop that locks the hanger spring against upward or downward movement for temporary conditions of underload or overload. The complete travel stop, the up travel stop only for cold set purposes or the down travel stop only which may be employed during erection, hydrostatic test (Anvil permits a hydrostatic test load of 2 times the normal operating load for the spring hanger) or chemical cleanout will be furnished only when specified. The travel stop is painted red and is installed at the factory with a caution tag attached calling attention that the device must be removed before the pipe line is put in service. Permanently attached travel stops available upon request.

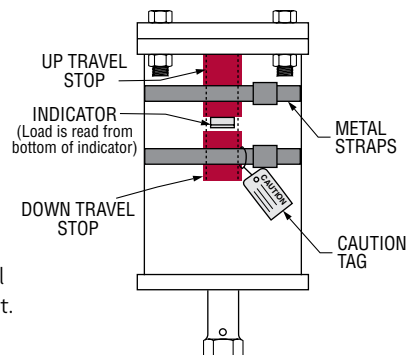


Figure B-268



Figure 82



Approvals: WW-H-171E (Types 51, 56 and 57), ANSI/MSS SP-69 and MSS SP-58 (Types 51, 52 and 53).

Specifications: Anvil Variable Spring Hangers are welded in strict accordance with ASME Section IX.

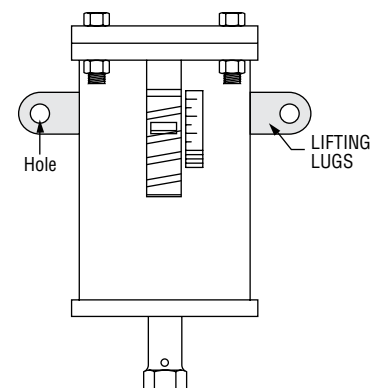
Size Range: The Anvil Variable Spring Hanger in five series and seven types is offered in twenty-three sizes (Fig. B-268 only is offered in twenty-five sizes). The hanger can be furnished to take loads 10 lbs. to 50,000 lbs.

Ordering:

- (1) Size
- (2) Type
- (3) Figure number
- (4) Product name
- (5) Desired supporting force in operating position
- (6) Calculated amount and direction of pipe movement from installed to operating position.
- (7) Customer's identification number (if any)
- (8) When ordering Type F spring specify if roller or guided load column is to be furnished.
- (9) When ordering Type G, specify total load and load per spring plus center to center rod dimensions.
- (10) If required, specify with travel stop
- (11) When ordering corrosion resistant, specify C-268, C-82, C-98, Triple-CR, or Quadruple-CR "completely galvanized except coated spring coil".

Note:

To help alleviate the problem of lifting large size spring hangers into position for installation, this product is available with lifting lugs (if required) on sizes weighing one hundred pounds or more.

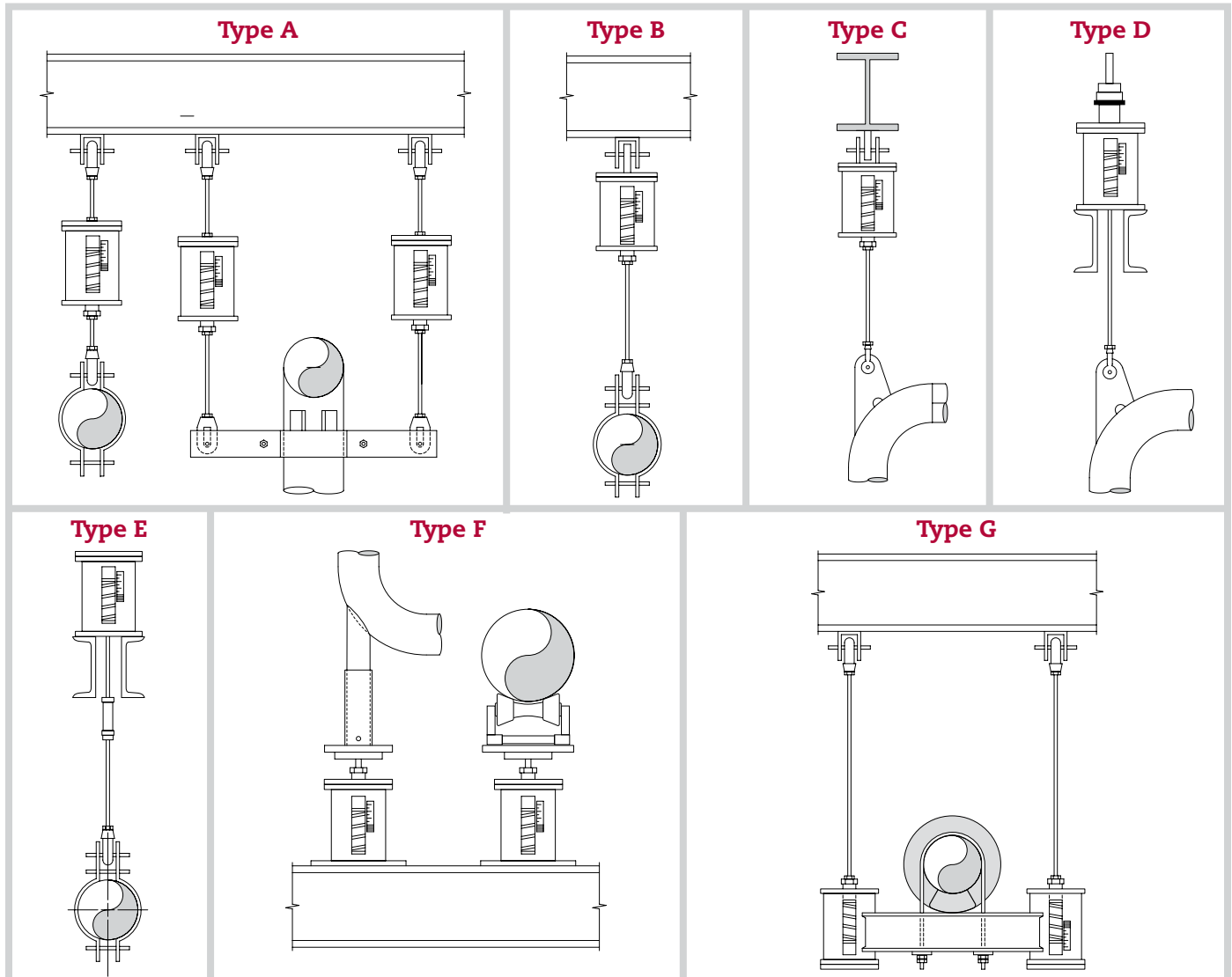


**Fig. 82, Fig. B-268, Fig. 98, Triple Spring, and Quadruple Spring (cont.)
Fig. C-82, Fig. C-268, Fig. C-98, Triple-CR, and Quadruple-CR Spring
(Corrosion Resistant)**

How to Determine Type: The type of variable spring hanger to be used depends upon the physical characteristics required by the suspension problem (e.g., amount of head room, whether pipe is to be supported above or below the spring, etc.).

Consideration should be given to the seven standard types offered (see illustration below). Special variable spring hangers can be fabricated for unusual conditions.

Spring Hanger Types – Typical Applications



Recommended Service: Pipe hangers located at points that are subject to vertical thermal movement and for which a constant support hanger is not required (see “recommended service” for constant support hanger, page 193). Type D & E spring hangers may accommodate less than 4° of rod swing depending on size, figure number, and application.

Installation: Securely attach hanger to the building. Attach lower hanger rod and turn the load coupling until the load indicator is positioned at the desired setting indicated on the load scale plate.

Adjustment of Hanger: Once installed in the line; the hanger should be adjusted until the load indicator moves to the white button marked “C” (cold position). On inspection of the system, after a reasonable period of operation, the load indicator should be at the red button marked “H” (hot position). If it is not, the hanger should be readjusted to the hot position. No other adjustment is necessary.

How to Determine Series: Complete sizing information is given on the hanger selection chart on pages 174 and 175. The sizing information is applicable to hangers of all series. As noted on the hanger selection charts that the total spring deflection in the casing leaves a reserve (overtravel) above and below the recommended working load range.

SPRING HANGERS

Spring Hanger Size and Series Selection

How to use hanger selection table: In order to choose a proper size hanger, it is necessary to know the actual load which the spring is to support and the amount and direction of the pipe line movement from the cold to the hot position.

Find the actual load of the pipe in the load table. As it is desirable to support the actual weight of the pipe when the line is hot, the actual load is the hot load. To determine the cold load, read the spring scale, up or down, for the amount of expected movement.

The chart must be read opposite from the direction of the pipe's movement. The load arrived at is the cold load.

If the cold load falls outside of the working load range of the hanger selected, relocate the actual or hot load in the adjacent column and find the cold load. When the hot and cold loads are both within the working range of a hanger, the size number of that hanger will be found at the top of the column.

| LOAD TABLE (LBS) FOR SELECTION OF HANGER SIZE (sizes 10 through 22 on next page) | | | | | | | | | | | | | | | | | |
|--|--------|----|-------|----|-----------------------------|----|---|-----|-----|-----|-----|-----|-----|-----|-----|-------|-----|
| Working Range (in) unshaded Shaded Rows Show Overtravel | | | | | Hanger size | | | | | | | | | | | | |
| | | | | | B-268 Only | | Fig. 82, Fig. B-268, Fig. 98, Triple & Quadruple Spring | | | | | | | | | | |
| Figure No. | | | | | 000 | 00 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | |
| Quad. | Triple | 98 | B-268 | 82 | | | | | | | | | | | | | |
| 2 | 1½ | 1 | ½ | ¼ | 7 | 19 | 43 | 63 | 81 | 105 | 141 | 189 | 252 | 336 | 450 | 600 | |
| | | | | | 7 | 20 | 44 | 66 | 84 | 109 | 147 | 197 | 263 | 350 | 469 | 625 | |
| | | | | | 8 | 22 | 46 | 68 | 88 | 114 | 153 | 206 | 273 | 364 | 488 | 650 | |
| | | | | | 9 | 24 | 48 | 71 | 91 | 118 | 159 | 213 | 284 | 378 | 506 | 675 | |
| 0 | 0 | 0 | 0 | 0 | 10 | 26 | 50 | 74 | 95 | 123 | 165 | 221 | 294 | 392 | 525 | 700 | |
| | | | | | 11 | 28 | 52 | 76 | 98 | 127 | 170 | 228 | 305 | 406 | 544 | 725 | |
| | | | | | 12 | 30 | 54 | 79 | 101 | 131 | 176 | 236 | 315 | 420 | 563 | 750 | |
| | | | | | 12 | 31 | 56 | 81 | 105 | 136 | 182 | 244 | 326 | 434 | 581 | 775 | |
| 2 | 1½ | 1 | ½ | ¼ | 14 | 34 | 58 | 84 | 108 | 140 | 188 | 252 | 336 | 448 | 600 | 800 | |
| | | | | | 14 | 35 | 59 | 87 | 111 | 144 | 194 | 260 | 347 | 462 | 619 | 825 | |
| | | | | | 15 | 38 | 61 | 89 | 115 | 149 | 200 | 268 | 357 | 476 | 638 | 850 | |
| | | | | | 16 | 40 | 63 | 92 | 118 | 153 | 206 | 276 | 368 | 490 | 656 | 875 | |
| 4 | 3 | 2 | 1 | ½ | 17 | 41 | 65 | 95 | 122 | 158 | 212 | 284 | 378 | 504 | 675 | 900 | |
| | | | | | 18 | 43 | 67 | 97 | 125 | 162 | 217 | 291 | 389 | 518 | 694 | 925 | |
| | | | | | 19 | 45 | 69 | 100 | 128 | 166 | 223 | 299 | 399 | 532 | 713 | 950 | |
| | | | | | 20 | 47 | 71 | 102 | 132 | 171 | 229 | 307 | 410 | 546 | 731 | 975 | |
| 6 | 4½ | 3 | 1½ | ¾ | 21 | 49 | 73 | 105 | 135 | 175 | 235 | 315 | 420 | 560 | 750 | 1,000 | |
| | | | | | 21 | 50 | 74 | 108 | 138 | 179 | 241 | 323 | 431 | 574 | 769 | 1,025 | |
| | | | | | 22 | 53 | 76 | 110 | 142 | 184 | 247 | 331 | 441 | 588 | 788 | 1,050 | |
| | | | | | 23 | 55 | 78 | 113 | 145 | 188 | 253 | 339 | 452 | 602 | 806 | 1,075 | |
| 8 | 6 | 4 | 2 | 1 | 24 | 56 | 80 | 116 | 149 | 193 | 258 | 347 | 462 | 616 | 825 | 1,100 | |
| | | | | | 25 | 58 | 82 | 118 | 152 | 197 | 264 | 354 | 473 | 630 | 844 | 1,125 | |
| | | | | | 26 | 60 | 84 | 121 | 155 | 201 | 270 | 362 | 483 | 644 | 863 | 1,150 | |
| | | | | | 27 | 62 | 86 | 123 | 159 | 206 | 276 | 370 | 494 | 658 | 881 | 1,175 | |
| 10 | 7½ | 5 | 2½ | 1¼ | 28 | 64 | 88 | 126 | 162 | 210 | 282 | 378 | 504 | 672 | 900 | 1,200 | |
| | | | | | 28 | 66 | 89 | 129 | 165 | 214 | 288 | 386 | 515 | 686 | 919 | 1,225 | |
| | | | | | 29 | 68 | 91 | 131 | 169 | 219 | 294 | 394 | 525 | 700 | 938 | 1,250 | |
| | | | | | 30 | 70 | 93 | 134 | 172 | 223 | 300 | 402 | 536 | 714 | 956 | 1,275 | |
| 2 | 1½ | 1 | ½ | ¼ | 31 | 72 | 95 | 137 | 176 | 228 | 306 | 410 | 546 | 728 | 975 | 1,300 | |
| | | | | | Spring Rate (lbs/in) | | | | | | | | | | | | |
| | | | | | 82 | – | – | 30 | 42 | 54 | 70 | 94 | 126 | 168 | 224 | 300 | 400 |
| | | | | | B-268 | 7 | 15 | 15 | 21 | 27 | 35 | 47 | 63 | 84 | 112 | 150 | 200 |
| 98 | – | – | 7 | 10 | 13 | 17 | 23 | 31 | 42 | 56 | 75 | 100 | | | | | |
| Triple | – | – | 5 | 7 | 9 | 12 | 16 | 21 | 28 | 37 | 50 | 67 | | | | | |
| Quadruple | – | – | 4 | 5 | 7 | 9 | 12 | 16 | 21 | 28 | 38 | 50 | | | | | |

Note: General rule for series selection use Fig. 82 for up to ½" of movement up to 1" use Fig. B-268, up to 2" use Fig. 98, up to 3" use a Triple, up to 4" use a Quadruple. Double check to assure desired variability is achieved.

Spring Hanger Size and Series Selection

How to use hanger selection table (cont.): Should it be impossible to select a hanger in a particular series such that both loads occur within the working range, consideration should be given to a variable spring hanger with a wider working range or a constant support hanger. The cold load is calculated by adding (for up movement) or subtracting (for down movement) the product of spring rate times movement to or from the hot load.

Cold load = (hot load) ± (movement) x (spring rate)

A key criteria in selecting the size and series of a variable spring is a factor known as variability. This is a measurement of the percentage change in supporting force between the hot and cold positions of a spring and is calculated from the formula:

Variability = (Movement) x (Spring Rate) / (Hot Load)

If an allowable variability is not specified, good practice would be to use 25% as recommended by MSS-SP-58.

| LOAD TABLE (LBS) FOR SELECTION OF HANGER SIZE (Continued from previous page) | | | | | | | | | | | | | | | | | |
|--|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|--|-------|----|--------|-------|
| Hanger size | | | | | | | | | | | | | Working Range (in) unshaded Shaded Rows Show Overtravel | | | | |
| Fig. 82, Fig. B-268, Fig. 98, Triple & Quadruple Spring | | | | | | | | | | | | | Figure No. | | | | |
| 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 82 | B-268 | 98 | Triple | Quad. |
| 780 | 1,020 | 1,350 | 1,800 | 2,400 | 3,240 | 4,500 | 6,000 | 7,990 | 10,610 | 14,100 | 18,750 | 25,005 | | | | | |
| 813 | 1,063 | 1,406 | 1,875 | 2,500 | 3,375 | 4,688 | 6,250 | 8,322 | 11,053 | 14,588 | 19,531 | 26,047 | ¼ | ½ | 1 | 1½ | 2 |
| 845 | 1,105 | 1,463 | 1,950 | 2,600 | 3,510 | 4,875 | 6,500 | 8,655 | 11,495 | 15,275 | 20,313 | 27,089 | | | | | |
| 878 | 1,148 | 1,519 | 2,025 | 2,700 | 3,645 | 5,063 | 6,750 | 8,987 | 11,938 | 15,863 | 21,094 | 28,131 | | | | | |
| 910 | 1,190 | 1,575 | 2,100 | 2,800 | 3,780 | 5,250 | 7,000 | 9,320 | 12,380 | 16,450 | 21,875 | 29,173 | 0 | 0 | 0 | 0 | 0 |
| 943 | 1,233 | 1,631 | 2,175 | 2,900 | 3,915 | 5,438 | 7,250 | 9,652 | 12,823 | 17,038 | 22,656 | 30,215 | | | | | |
| 975 | 1,275 | 1,688 | 2,250 | 3,000 | 4,050 | 5,625 | 7,500 | 9,985 | 13,265 | 17,625 | 23,438 | 31,256 | | | | | |
| 1,008 | 1,318 | 1,744 | 2,325 | 3,100 | 4,185 | 5,813 | 7,750 | 10,317 | 13,708 | 18,213 | 24,219 | 32,298 | | | | | |
| 1,040 | 1,360 | 1,800 | 2,400 | 3,200 | 4,320 | 6,000 | 8,000 | 10,650 | 14,150 | 18,800 | 25,000 | 33,340 | ¼ | ½ | 1 | 1½ | 2 |
| 1,073 | 1,403 | 1,856 | 2,475 | 3,300 | 4,455 | 6,188 | 8,250 | 10,982 | 14,592 | 19,388 | 25,781 | 34,382 | | | | | |
| 1,105 | 1,445 | 1,913 | 2,550 | 3,400 | 4,590 | 6,375 | 8,500 | 11,315 | 15,035 | 19,975 | 26,563 | 35,424 | | | | | |
| 1,138 | 1,488 | 1,969 | 2,625 | 3,500 | 4,725 | 6,563 | 8,750 | 11,647 | 15,477 | 20,563 | 27,344 | 36,466 | | | | | |
| 1,170 | 1,530 | 2,025 | 2,700 | 3,600 | 4,860 | 6,750 | 9,000 | 11,980 | 15,920 | 21,150 | 28,125 | 37,508 | ½ | 1 | 2 | 3 | 4 |
| 1,203 | 1,573 | 2,081 | 2,775 | 3,700 | 4,995 | 6,938 | 9,250 | 12,312 | 16,362 | 21,738 | 28,906 | 38,549 | | | | | |
| 1,235 | 1,615 | 2,138 | 2,850 | 3,800 | 5,130 | 7,125 | 9,500 | 12,645 | 16,805 | 22,325 | 29,688 | 39,591 | | | | | |
| 1,268 | 1,658 | 2,194 | 2,925 | 3,900 | 5,265 | 7,313 | 9,750 | 12,977 | 17,247 | 22,913 | 30,469 | 40,633 | | | | | |
| 1,300 | 1,700 | 2,250 | 3,000 | 4,000 | 5,400 | 7,500 | 10,000 | 13,310 | 17,690 | 23,500 | 31,250 | 41,675 | ¾ | 1½ | 3 | 4½ | 6 |
| 1,333 | 1,743 | 2,306 | 3,075 | 4,100 | 5,535 | 7,688 | 10,250 | 13,642 | 18,132 | 24,088 | 32,031 | 42,717 | | | | | |
| 1,365 | 1,785 | 2,363 | 3,150 | 4,200 | 5,670 | 7,875 | 10,500 | 13,975 | 18,575 | 24,675 | 32,813 | 43,759 | | | | | |
| 1,398 | 1,828 | 2,419 | 3,225 | 4,300 | 5,805 | 8,063 | 10,750 | 14,307 | 19,017 | 25,263 | 33,594 | 44,801 | | | | | |
| 1,430 | 1,870 | 2,475 | 3,300 | 4,400 | 5,940 | 8,250 | 11,000 | 14,640 | 19,460 | 25,850 | 34,375 | 45,843 | 1 | 2 | 4 | 6 | 8 |
| 1,463 | 1,913 | 2,531 | 3,375 | 4,500 | 6,075 | 8,438 | 11,250 | 14,972 | 19,902 | 26,438 | 35,156 | 46,885 | | | | | |
| 1,495 | 1,955 | 2,588 | 3,450 | 4,600 | 6,210 | 8,625 | 11,500 | 15,305 | 20,345 | 27,025 | 35,938 | 47,926 | | | | | |
| 1,528 | 1,998 | 2,644 | 3,525 | 4,700 | 6,345 | 8,813 | 11,750 | 15,637 | 20,787 | 27,613 | 36,719 | 48,968 | | | | | |
| 1,560 | 2,040 | 2,700 | 3,600 | 4,800 | 6,480 | 9,000 | 12,000 | 15,970 | 21,230 | 28,200 | 37,500 | 50,010 | 1¼ | 2½ | 5 | 7½ | 10 |
| 1,593 | 2,083 | 2,756 | 3,675 | 4,900 | 6,615 | 9,188 | 12,250 | 16,302 | 21,672 | 28,788 | 38,281 | 51,052 | | | | | |
| 1,625 | 2,125 | 2,813 | 3,750 | 5,000 | 6,750 | 9,375 | 12,500 | 16,635 | 22,115 | 29,375 | 39,063 | 52,094 | ¼ | ½ | 1 | 1½ | 2 |
| 1,658 | 2,168 | 2,869 | 3,825 | 5,100 | 6,885 | 9,563 | 12,750 | 16,967 | 22,557 | 29,963 | 39,844 | 53,136 | | | | | |
| 1,690 | 2,210 | 2,925 | 3,900 | 5,200 | 7,020 | 9,750 | 13,000 | 17,300 | 23,000 | 30,550 | 40,625 | 54,178 | | | | | |
| Spring Rate (lbs/in) | | | | | | | | | | | | | | | | | |
| 520 | 680 | 900 | 1,200 | 1,600 | 2,160 | 3,000 | 4,000 | 5,320 | 7,080 | 9,400 | 12,500 | 16,670 | 82 | | | | |
| 260 | 340 | 450 | 600 | 800 | 1,080 | 1,500 | 2,000 | 2,660 | 3,540 | 4,700 | 6,250 | 8,335 | B-268 | | | | |
| 130 | 170 | 225 | 300 | 400 | 540 | 750 | 1,000 | 1,330 | 1,770 | 2,350 | 3,125 | 4,167 | 98 | | | | |
| 87 | 113 | 150 | 200 | 267 | 360 | 500 | 667 | 887 | 1,180 | 1,567 | 2,083 | 2,778 | Triple | | | | |
| 65 | 85 | 113 | 150 | 200 | 270 | 375 | 500 | 665 | 885 | 1,175 | 1,563 | 2,084 | Quadruple | | | | |

Note: General rule for series selection use Fig. 82 for up to ½" of movement up to 1" use Fig. B-268, up to 2" use Fig. 98, up to 3" use a Triple, up to 4" use a Quadruple. Double check to assure desired variability is achieved.



SPRING HANGERS

Variable Spring

Check List for Requesting a Quote or Ordering

Page ___ of ___



Anvil International
Precision Park
160 Frenchtown Rd.
North Kingstown, RI 02852

For technical information regarding
Variable Springs Call or Email:
Phone Number: (401) 886-3020
Email: eps_contact@anvilintl.com

Finish: Standard Primer: _____ Galvanized: _____ Special Coating: _____

Quantity: _____

Figure No.: Options are: 82, B-268, 98, Triple, Quadruple
or: C-82, C-268, C-98, Triple-CR, Quadruple-CR

Size: Options are: #0 through #22 (B-268 / C-268 also available in #00 and #000) _____

Type: Options are: A through G* _____

Hot (Operating or Design) Load (lbs): _____ (optional)**

Cold/Installed (Factory Set) Load (lbs): _____ (optional)**

Vertical Movement: _____ + (up) or - (down) (optional)**

Mark Number: _____ (If Required)

Travel Stops: Yes: _____ No: _____

If travel stops are ordered and hot & cold loads are not provided, then the spring will be set to mid range load.

Lifting Lugs: Yes: _____ No: _____

Available on sizes weighing 100 lbs or more.

Notes:

* Type G Springs must also include the C-to-C dimension & the load per spring.

** Anvil will determine the appropriate Figure Number and will calculate the Cold Load when only the Hot Load and movement are specified.

Fig. B-268, C-268

Spring Hangers (Type A)

Type A is the basic unit of Fig. B-268 Anvil Variable Spring Hanger. It is designed for attachment to its supporting member by screwing a rod into a tapped hole in the top cap of the hanger the full depth of the top cap ("G" dimension). The upper jam nut should then be locked, securing the hanger. Adjustment of the hanger load is accomplished by turning the coupling on the lower hanger rod until the hanger picks up the load and the load indicator points to the desired position.

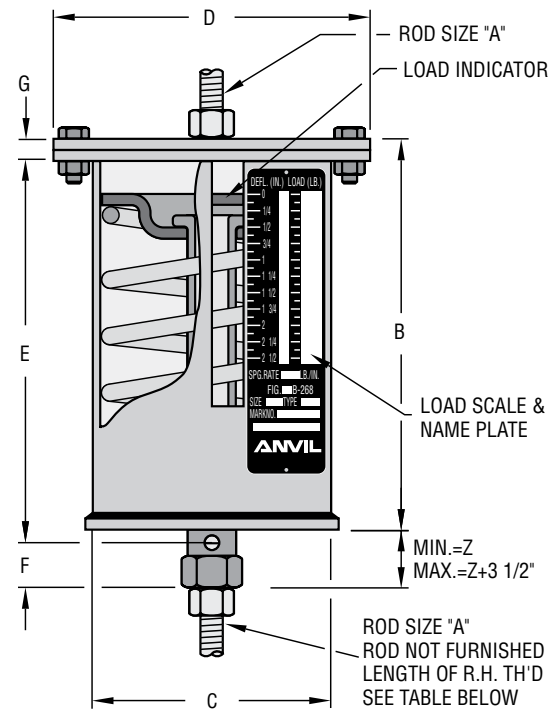


FIG. B-268, FIG. C-268 TYPE A: DIMENSIONS (IN) • WEIGHT (LBS)

| Hanger Size | Weight | Rod Size A | R.H. Thread Length | Casing Length B | Casing Diam C | Flange Diam D | Rod Take Out E | Min. Thread Engagement F | Thread Depth G | Z |
|-------------|--------|------------|--------------------|-----------------|---------------|---------------|----------------|--------------------------|----------------|---------|
| 000 | 5 | 1/2 | 5 | 5 5/8 | 4 | 5 1/8 | 5 1/16 | 1 5/16 | 7/16 | 1 3/16 |
| 00 | 6 | | | 7 9/16 | | | 7 3/8 | | | 1 3/16 |
| 0 | 8 | 1/2 | 5 | 6 11/16 | 4 | 5 1/8 | 6 1/16 | 1 5/16 | 7/16 | 3/4 |
| 1 | 8 | | | 7 9/16 | | | 6 15/16 | | | 7 1/16 |
| 2 | 9 | 1/2 | 5 | 8 5/16 | 5 9/16 | 6 15/16 | 7 15/16 | 1 5/16 | 7/16 | 1 |
| 3 | 14 | | | 7 15/16 | | | 7 9/16 | | | 1 |
| 4 | 15 | 1/2 | 5 | 7 15/16 | 5 9/16 | 6 15/16 | 7 15/16 | 1 5/16 | 7/16 | 1 3/8 |
| 5 | 16 | | | 8 5/8 | | | 7 15/16 | | | 1 1/16 |
| 6 | 26 | 5/8 | 5 | 8 13/16 | 6 5/8 | 8 3/8 | 7 13/16 | 1 5/16 | 5/8 | 9/16 |
| 7 | 29 | | | 10 | | | 9 1/16 | | | 5/8 |
| 8 | 31 | 3/4 | 6 | 10 7/16 | 8 5/8 | 10 3/4 | 8 15/16 | 1 1/4 | 1 | 3/4 |
| 9 | 65 | | | 12 7/8 | | | 11 3/8 | | | 1 1/2 |
| 10 | 71 | 1 | 6 | 10 7/16 | 8 5/8 | 10 3/4 | 9 7/8 | 1 1/4 | 1 | 1 1/16 |
| 11 | 65 | | | 13 3/8 | | | 11 3/8 | | | 1/2 |
| 12 | 71 | 1 1/4 | 7 | 13 3/4 | 8 5/8 | 10 3/4 | 11 3/8 | 1 1/4 | 1 1/4 | 3/8 |
| 13 | 89 | | | 13 3/4 | | | 11 3/8 | | | 3/8 |
| 14 | 93 | 1 1/2 | 8 | 16 1/16 | 8 5/8 | 11 3/8 | 14 13/16 | 1 15/16 | 1 3/8 | 2 1/16 |
| 15 | 111 | | | 18 7/8 | | | 16 3/4 | | | 1 15/16 |
| 16 | 133 | 2 | 9 | 18 1/4 | 12 3/4 | 15 7/8 | 16 | 2 3/4 | 2 1/4 | 2 9/16 |
| 17 | 162 | | | 20 1/2 | | | 18 3/8 | | | 2 1/16 |
| 18 | 330 | 2 1/4 | 10 | 23 3/4 | 12 3/4 | 16 7/8 | 21 5/8 | 3 5/8 | 2 3/4 | 3 1/16 |
| 19 | 376 | | | 27 5/16 | | | 23 7/8 | | | 3 1/16 |
| 20 | 480 | 3 | 11 | 33 3/8 | 12 3/4 | 16 7/8 | 29 3/4 | 3 5/8 | 3 | 3 3/4 |
| 21 | 556 | | | 27 5/16 | | | 29 3/4 | | | 3 5/8 |
| 22 | 705 | | | | | | | | | |

SPRING HANGERS

Fig. B-268, C-268

Spring Hangers (Type B & Type C)

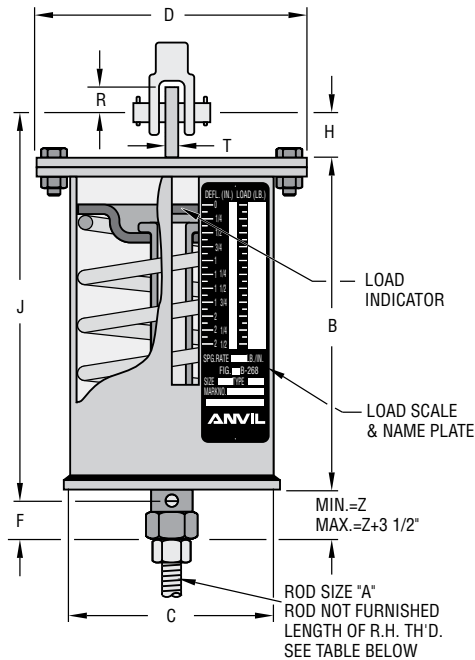


Fig. B-268 Type B

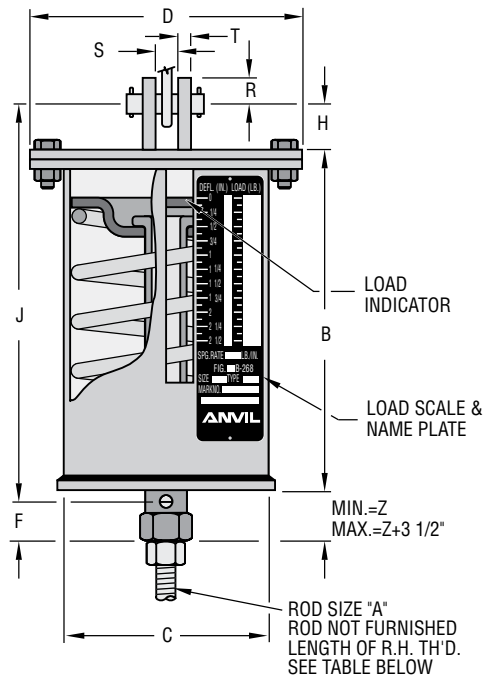


Fig. B-268 Type C

Type B is furnished with a single lug for attachment to the building structure. The lug permits use of a clevis, welded beam attachment or a pair of angles for attachment where headroom is limited.

Type C is furnished with two lugs for attachment to the building structure. These two lugs permit the use of an eye rod, Fig. 55L or a single plate for attachment where headroom is limited.

FIG. B-268, FIG. C-268 TYPE B, C: DIMENSIONS (IN) • WEIGHT (LBS)

| Hanger Size | Weight (lbs) | Rod Size A | R.H. Thread Length | Lug Hole Size | Casing Length B | Casing Diam C | Flange Diam D | Min. Thd Engagement F | Height of Pin H | Rod Take Out J | R | Clevis Opening S | Thickness T | Z |
|-------------|--------------|------------|--------------------|---------------|-----------------|---------------|---------------|-----------------------|-----------------|----------------|-------|------------------|-------------|---------|
| 000 | 5 | 1/2 | 5 | 1 1/16 | 5 5/8 | 4 | 5 5/8 | 1 5/16 | 1 1/2 | 7 | 1 1/4 | 7/8 | 1/4 | 1 3/16 |
| 00 | 6 | | | | 7 9/16 | | | | | 9 1/2 | | | | 1 3/16 |
| 0 | 8 | 1/2 | 5 | 1 1/16 | 6 11/16 | 4 | 5 5/8 | 1 5/16 | 1 1/2 | 8 | 1 1/4 | 7/8 | 1/4 | 3/4 |
| 1 | 9 | | | | 7 9/16 | | | | | 8 5/16 | | | | 1 |
| 2 | 10 | 1/2 | 5 | 1 1/16 | 7 15/16 | 5 9/16 | 6 15/16 | 1 5/16 | 1 1/2 | 9 1/2 | 1 1/4 | 7/8 | 1/4 | 1 |
| 3 | 14 | | | | | | | | | | | | | 8 5/8 |
| 4 | 16 | 1/2 | 5 | 1 1/16 | 8 5/8 | 5 9/16 | 6 15/16 | 1 5/16 | 1 1/2 | 9 3/8 | 1 1/4 | 7/8 | 1/4 | 1 3/8 |
| 5 | 17 | | | | | | | | | | | | | 8 5/8 |
| 6 | 27 | 5/8 | 5 | 1 3/16 | 8 13/16 | 6 5/8 | 8 3/8 | 1 5/16 | 1 1/2 | 9 15/16 | 1 1/4 | 1 1/16 | 1/4 | 9/16 |
| 7 | 30 | | | | 10 | | | | | 11 1/16 | | | | 5/8 |
| 8 | 32 | 3/4 | 6 | 1 5/16 | 10 7/16 | 8 5/8 | 10 3/4 | 1 1/4 | 1 1/2 | 11 7/16 | 1 1/4 | 1 1/4 | 3/8 | 3/4 |
| 9 | 66 | | | | 12 1/8 | | | | | 12 3/8 | | | | 1 1/2 |
| 10 | 72 | 3/4 | 6 | 1 5/16 | 10 7/16 | 8 5/8 | 10 3/4 | 1 1/4 | 1 1/2 | 12 3/8 | 1 1/4 | 1 1/4 | 3/8 | 1 1/2 |
| 11 | 66 | | | | 13 3/8 | | | | | 12 3/8 | | | | 1 1/16 |
| 12 | 71 | 1 | 6 | 1 1/4 | 10 7/16 | 8 5/8 | 10 3/4 | 1 1/4 | 2 | 12 1/2 | 1 1/2 | 1 5/8 | 1/2 | 1 1/16 |
| 13 | 89 | | | | 13 3/8 | | | | | 14 3/8 | | | | 1/2 |
| 14 | 94 | 1 1/4 | 7 | 1 1/2 | 13 3/4 | 8 5/8 | 10 3/4 | 1 1/4 | 3 | 15 3/8 | 2 | 2 | 5/8 | 3/8 |
| 15 | 114 | 1 1/4 | | | 13 3/4 | | | | | 10 3/4 | | | | 15 3/8 |
| 16 | 138 | 1 1/2 | 8 | 1 3/4 | 16 1/16 | 8 5/8 | 11 3/8 | 1 15/16 | 3 | 19 3/16 | 2 1/2 | 2 3/8 | 3/4 | 2 1/16 |
| 17 | 168 | 1 3/4 | | | 2 | | | | | 18 1/8 | | | | 21 1/8 |
| 18 | 331 | 2 | 9 | 2 3/8 | 18 1/4 | 12 3/4 | 15 7/8 | 2 3/4 | 4 | 22 3/8 | 3 | 2 7/8 | 3/4 | 2 9/16 |
| 19 | 378 | 2 1/4 | | | 20 1/2 | | | | | 12 3/4 | | | | 15 7/8 |
| 20 | 486 | 2 1/2 | 10 | 2 7/8 | 23 3/4 | 12 3/4 | 16 7/8 | 3 3/8 | 4 1/2 | 28 3/4 | 4 | 3 3/8 | 1 | 3 11/16 |
| 21 | 568 | 2 3/4 | | | 27 3/16 | | | | | 12 3/4 | | | | 16 7/8 |
| 22 | 714 | 3 | 11 | 3 3/8 | 33 3/8 | 12 3/4 | 16 7/8 | 3 3/8 | 5 | 37 3/4 | 4 | 3 3/8 | 1 | 3 3/4 |

Fig. B-268, C-268

Spring Hangers (Type D & Type E)

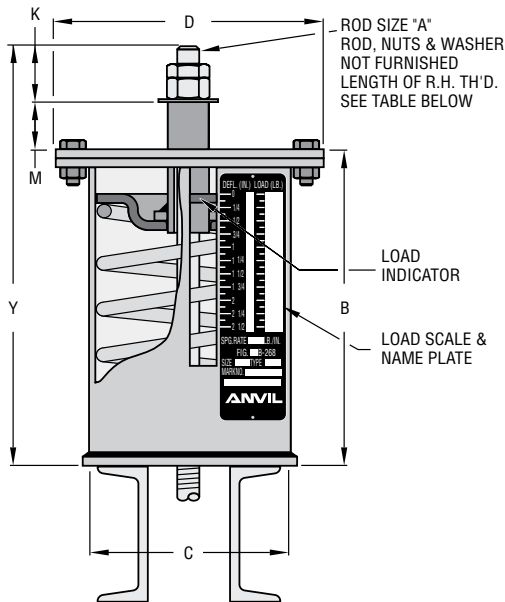


Fig. B-268 Type D

Type D permits adjustment of the hanger from the top. This type has a piece of tubing which passes through a hole in the top cap. Type D is especially adapted for use where the hanger is set above the supporting beams and pipe is suspended below.

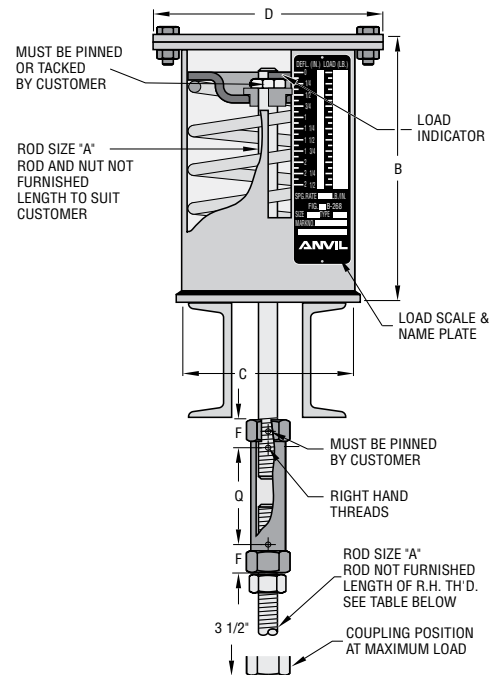


Fig. B-268 Type E

Type E is designed to permit adjustment from either above or below the hanger, when it is installed upon the supporting member and pipe is suspended below. A coupling tapped right hand both ends is furnished.

FIG. B-268, FIG. C-268 TYPE D, E: DIMENSIONS (IN) • WEIGHT (LBS)

| Hanger Size | Weight (lbs) | Rod Size A | R.H. Thd Length | Casing Length B | Casing Diam C | Flange Diam D | Min Thread Engagement F | Allowance for Nuts K | Height of Spacer M | Rod Length Y | Rod Take-out Q | | |
|-------------|--------------|------------|-----------------|-----------------|---------------|---------------|-------------------------|----------------------|--------------------|--------------|----------------|--------|--------|
| 000 | 5 | 1/2 | 5 | 5 5/8 | 4 | 5 1/8 | 1 3/16 | 1 1/4 | 3 3/8 | 10 | 6 | | |
| 00 | 6 | | | 7 9/16 | | | | | | 11 3/4 | | | |
| 0 | 6 | | | 6 1 1/16 | | | | | | 11 1/16 | | | |
| 1 | 7 | 1/2 | 5 | 7 9/16 | 4 | 5 1/8 | 1 5/16 | 1 1/4 | 3 3/8 | 11 15/16 | 6 | | |
| 2 | 8 | | | 8 5/16 | | | | | | 12 11/16 | | | |
| 3 | 11 | | | 7 1 5/16 | | | | | | 11 11/16 | | | |
| 4 | 12 | 1/2 | 5 | 8 5/8 | 5 9/16 | 6 15/16 | 1 5/16 | 1 1/4 | 3 3/8 | 12 5/16 | 6 | | |
| 5 | 14 | | | 8 3/8 | | | | | | 13 | | | |
| 6 | 22 | | | 8 3/16 | | | | | | 13 5/16 | | | |
| 7 | 25 | 5/8 | 5 | 10 | 6 5/8 | 8 3/8 | 1 5/16 | 1 1/2 | 3 | 14 1/4 | 6 | | |
| 8 | 26 | | | 14 3/4 | | | | | | | | | |
| 9 | 51 | | | 10 7/16 | | | | | | 15 5/8 | | | |
| 10 | 58 | 3/4 | 6 | 12 1/8 | 8 5/8 | 10 3/4 | 1 1/4 | 1 3/4 | 3 | 16 7/8 | 6 | | |
| 11 | 51 | | | 10 7/16 | | | | | | 14 11/16 | | | |
| 12 | 56 | | | 10 7/16 | | | | | | 15 13/16 | | | |
| 13 | 73 | 1 | 6 | 10 7/16 | 8 5/8 | 10 3/4 | 1 1/4 | 2 1/4 | 3 | 18 3/8 | 6 | | |
| 14 | 77 | | | 13 3/8 | | | | | | 19 1/4 | | | |
| 15 | 88 | | | 1 1/4 | | | | | | 7 | | 13 3/8 | 8 5/8 |
| 16 | 107 | 1 1/2 | 8 | 15 15/16 | 11 3/8 | 1 15/16 | 3 1/2 | 3 | 22 9/16 | | | | |
| 17 | 133 | 1 3/4 | 8 | 18 | | | | | 1 15/16 | 4 | 3 | 25 1/8 | |
| 18 | 262 | 2 | 9 | 18 1/4 | | | | | | | | 12 3/4 | 15 7/8 |
| 19 | 300 | 2 1/4 | 9 | 20 1/2 | 12 3/4 | 15 7/8 | 2 3/4 | 3 | | | | | |
| 20 | 370 | 2 1/2 | 10 | 23 3/4 | | | | | 12 3/4 | 16 7/8 | 3 5/8 | | |
| 21 | 455 | 2 3/4 | 10 | 27 5/16 | | | | | | | | 12 3/4 | 16 7/8 |
| 22 | 505 | 3 | 11 | 33 3/8 | 12 3/4 | 16 7/8 | 3 5/8 | 3 | | | | | |

SPRING HANGERS

Fig. B-268, C-268

Spring Hangers (Type F)

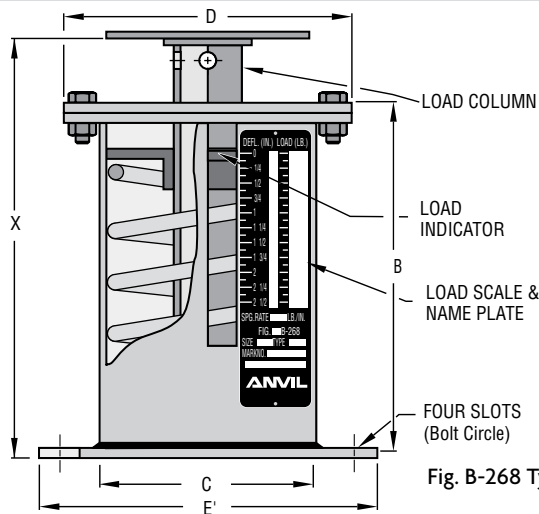
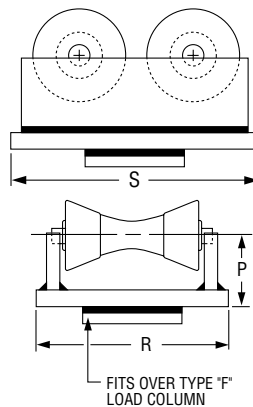


Fig. B-268 Type F



PIPE ROLL: DIMENSIONS (IN), LOAD (LBS)

| Roll Size | Roll Mat'l | Max Load | P | R | S |
|-----------|------------|----------|----|-----|----|
| 2 - 3½ | Cast Iron | 780 | 1¼ | 4½ | 4½ |
| 4 - 6 | Cast Iron | 1,900 | 2⅝ | 5⅝ | 5½ |
| 8 - 10 | Cast Iron | 4,200 | 2¾ | 8¼ | 6¾ |
| 8 - 10 | Steel | 14,000 | 2¾ | 8¼ | 6¾ |
| 12 - 14 | Cast Iron | 6,150 | 3½ | 10⅝ | 6¾ |
| 12 - 14 | Steel | 26,000 | 3½ | 12 | 6¾ |
| 16 - 20 | Cast Iron | 9,960 | 3¾ | 12 | 6¾ |
| 16 - 20 | Steel | 34,000 | 3¾ | 12 | 6¾ |
| 24 | Cast Iron | 12,200 | 4 | 13¼ | 7 |
| 24 | Steel | 60,000 | 4 | 13¼ | 10 |
| 30 | Cast Iron | 15,000 | 4½ | 16½ | 8¼ |
| 30 | Steel | 60,000 | 5 | 16½ | 10 |
| 36 | Cast Iron | 24,000 | 4⅝ | 19 | 13 |
| 36 | Steel | 60,000 | 5 | 19 | 12 |

Type F is for use under a base elbow or piping that must be supported directly from the floor. If more than ¼" of horizontal translation occurs of loads resting on the flat load flange or other flat surface junction between the type F spring hanger and the load, a double roller design pipe roll is recommended. Pipe rolls, as illustrated above, will be furnished on request. For dimension of the pipe roll, refer to Fig. 271, see page 160.

Base type variable springs will be furnished with an extended load column on special order. Guided Load Columns and roller are available on request.

Adjustment to the required load rating is made by inserting a bar into holes provided in the load column and turning the column. The 2" increment between minimum and maximum "X" dimensions is the amount of field adjustment available and is in excess of the amount required for load adjustment.

FIG. B-268, FIG. C-268 TYPE F: DIMENSIONS (IN) • WEIGHT (LBS)

| Hanger Size | Weight | Casing Length B | Casing Diam C | Flange Diam D | Bottom Flange Sq. E' | Bottom Flange Bolt Circle | | Bottom Flange Bolts | Thickness Bottom Flange | Lengths - X* | | Load Col. Diam | Load Flange Diam | Thickness of Load Flange |
|-------------|--------|-----------------|---------------|---------------|----------------------|---------------------------|-----|---------------------|-------------------------|--------------|-----|----------------|------------------|--------------------------|
| | | | | | | Min | Max | | | Min | Max | | | |
| 000 | 11 | 5⅛ | 4 | 5½ | 7½ | 7 | 8¾ | ¾ | ¼ | 7⅞ | 9⅞ | 1.9 | 3⅞ | ⅜ |
| 00 | 12 | 7⅝ | | | | | | | | 9⅞ | 11⅞ | | | |
| 0 | 12 | 6¾ | 4 | 5½ | 7½ | 7 | 8¾ | ¾ | ¼ | 8¼ | 10¼ | 1.9 | 3⅞ | ⅜ |
| 1 | 14 | 7⅝ | | | | | | | | 9⅞ | 11⅞ | | | |
| 2 | 15 | 8⅝ | 5⅞ | 6⅝ | 7½ | 7 | 8¾ | ¾ | ¼ | 9⅞ | 11⅞ | 2.875 | 5⅞ | ⅜ |
| 3 | 23 | 8 | | | | | | | | 9⅞ | 11⅞ | | | |
| 4 | 25 | 8⅛ | 5⅞ | 6⅝ | 7½ | 7 | 8¾ | ¾ | ¼ | 10¼ | 12¼ | 2.875 | 5⅞ | ⅜ |
| 5 | 26 | | | | | | | | | 10½ | 12½ | | | |
| 6 | 40 | 8⅝ | 6⅞ | 8⅞ | 9 | 8 | 10⅞ | ¾ | ¾ | 11⅞ | 13⅞ | 3.5 | 6⅞ | ¼ |
| 7 | 46 | 10⅞ | | | | | | | | 13⅞ | 15⅞ | | | |
| 8 | 47 | 10⅞ | 8⅞ | 10¾ | 13¼ | 10⅞ | 16½ | ¾ | ½ | 12⅞ | 14⅞ | 4.5 | 8⅞ | ½ |
| 9 | 91 | | | | | | | | | 14⅞ | 16⅞ | | | |
| 10 | 98 | 12¼ | 8⅞ | 10¾ | 13¼ | 10⅞ | 16½ | ¾ | ½ | 13⅞ | 15⅞ | 4.5 | 8⅞ | ½ |
| 11 | 90 | 10⅞ | | | | | | | | 12⅞ | 14⅞ | | | |
| 12 | 95 | 10⅞ | 8⅞ | 10¾ | 13¼ | 10⅞ | 16½ | ¾ | ½ | 12⅞ | 14⅞ | 4.5 | 8⅞ | ½ |
| 13 | 115 | 14⅞ | | | | | | | | 16⅞ | | | | |
| 14 | 119 | 13¼ | 8⅞ | 10¾ | 13¼ | 10⅞ | 16½ | ¾ | ½ | 14⅞ | 16⅞ | 4.5 | 8⅞ | ½ |
| 15 | 130 | 13¼ | | | | | | | | 17⅞ | 19⅞ | | | |
| 16 | 150 | 15⅝ | 8⅞ | 11⅞ | 13¼ | 10⅞ | 16½ | ¾ | ½ | 17⅞ | 19⅞ | 2.0 | 8⅞ | ½ |
| 17 | 173 | 18 | | | | | | | | 20 | 22 | | | |
| 18 | 343 | 18¼ | 12¼ | 15⅞ | 17¼ | 15¼ | 22 | ¾ | ⅝ | 20⅞ | 22⅞ | 2.5 | 12½ | ½ |
| 19 | 380 | 20½ | | | | | | | | 22⅞ | 24⅞ | | | |
| 20 | 471 | 23¼ | 12¼ | 16⅞ | 17¼ | 15¼ | 22 | ¾ | ⅝ | 25⅞ | 27⅞ | 3.0 | 12½ | ½ |
| 21 | 496 | 27⅞ | | | | | | | | 29⅞ | 31⅞ | | | |
| 22 | 654 | 33⅞ | 12¼ | 16⅞ | 17¼ | 15¼ | 22 | ¾ | ⅝ | 35⅞ | 37⅞ | 3.0 | 12½ | ½ |

*Hanger take-out or installed height. With pipe movement up, cold to hot, installed height should be the mid-point between the minimum and maximum "X" dimension, plus thickness of load flange. With pipe movement down, cold to hot installed height should be mid-point between the minimum and maximum "X" dimension, plus the amount of vertical movement and load flange thickness. Note: Sizes 16" and larger are furnished with a hexagon nut at the top of a solid load column to facilitate adjustment with a wrench.

Fig. B-268, Fig. C-268

Spring Hangers (Type G)

Type G is a complete trapeze assembly. The hanger consists of two standard spring units plus a pair of back-to-back channels welded at each end to the hanger casing.

The "P" dimension can be varied with the customer's instructions. In sizing a Type G hanger, it must be remembered that each standard spring unit carries one-half of the total pipe load.

Therefore, in using the hanger selection chart, use one-half of the total pipe load as the hot load.

When the pipe line is designed so as not to be centered on the channel, one spring of the trapeze will carry a heavier load, the other a lighter load. Care should be taken in calculating the load of each hanger and in choosing the proper sized spring in such cases. The center-to-center rod dimension must be specified when ordering.

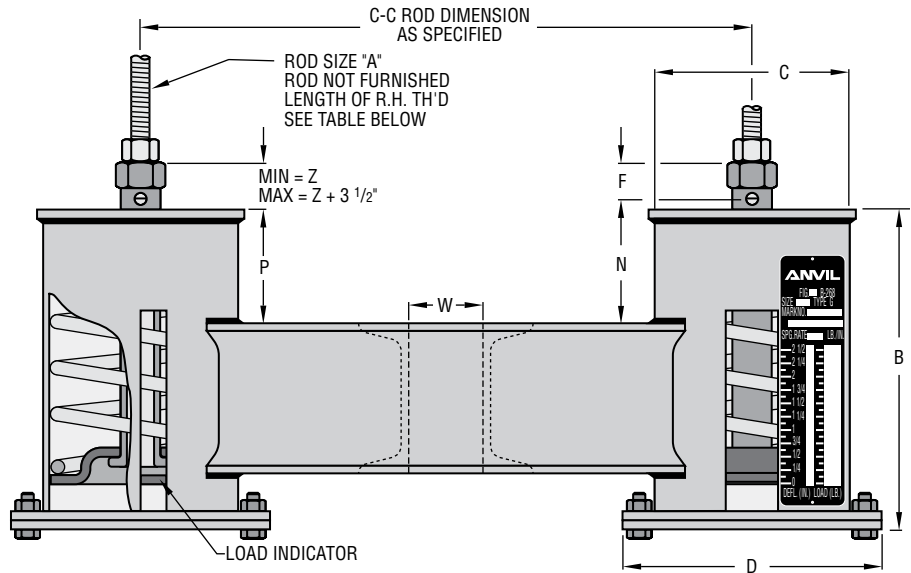


Fig. B-268 Type G

FIG. B-268, C-268 TYPE G: DIMENSIONS (IN) • WEIGHT (LBS)

| Hanger Size | Weight* | Rod Size A | R.H. Thread Length | Casing Length B | Casing Dia. C | Flange Dia. D | Min Thread Engagement F | Rod Take Out N | Channel Size (lb/ft) | Max C-C | Space Between Channels W | P | Z |
|-------------|---------|------------|--------------------|-----------------|---------------|---------------|-------------------------|----------------|----------------------|---------|--------------------------|-------|---------|
| 000 | 24 | 1/2 | 5 | 5 3/8 | 4 | 5 1/8 | 1 5/16 | 1 3/8 | C3 x 4.1 | 24 | 5/8 | 1 1/2 | 1 3/16 |
| 00 | 26 | | | 7 9/16 | | | | 1 3/4 | | | | | 1 3/16 |
| 0 | 30 | 1/2 | 5 | 6 11/16 | 4 | 5 1/8 | 1 5/16 | 1 5/16 | C3 x 4.1 | 24 | 5/8 | 1 1/2 | 3/4 |
| 1 | 31 | | | 7 9/16 | | | | 1 9/16 | | | | | 1 |
| 2 | 32 | | | 8 5/16 | | | | 2 1/16 | | | | | 1 1/16 |
| 3 | 41 | 1/2 | 5 | 7 15/16 | 5 9/16 | 6 15/16 | 1 5/16 | 2 1/16 | C3 x 4.1 | 30 | 3/4 | 2 | 1 |
| 4 | 42 | | | 7 15/16 | | | | 2 7/16 | | | | | 1 3/8 |
| 5 | 43 | | | 8 5/8 | | | | 1 3/4 | | | | | 1 11/16 |
| 6 | 63 | 5/8 | 5 | 8 13/16 | 6 5/8 | 8 3/8 | 1 5/16 | 1 5/8 | C3 x 4.1 | 36 | 1 | 2 | 9/16 |
| 7 | 69 | | | 10 | | | | 1 11/16 | | | | | 5/8 |
| 8 | 73 | | | 10 | | | | 1 11/16 | | | | | 5/8 |
| 9 | 143 | 3/4 | 6 | 10 7/16 | 8 5/8 | 10 3/4 | 1 1/4 | 2 1/2 | C4 x 5.4 | 36 | 1 1/4 | 3 | 3/4 |
| 10 | 157 | | | 12 1/8 | | | | 3 3/4 | | | | | 1 1/2 |
| 11 | 145 | | | 10 7/16 | | | | 3 7/16 | | | | | 1 11/16 |
| 12 | 157 | 1 | 6 | 10 7/16 | 8 5/8 | 10 3/4 | 1 1/4 | 3 13/16 | C5 x 6.7 | 36 | 1 1/2 | 3 | 1 1/16 |
| 13 | 195 | | | 13 1/8 | | | | 3 3/4 | | | | | 1 1/2 |
| 14 | 203 | 1 1/4 | 7 | 13 1/4 | 8 5/8 | 10 3/4 | 1 1/4 | 3 3/8 | C6 x 10.5 | 33 | 1 1/2 | 3 | 3/8 |
| 15 | 250 | 1 1/4 | 7 | 13 1/4 | | | | 10 3/4 | | | | | 3 15/16 |
| 16 | 298 | 1 1/2 | 8 | 16 1/16 | 8 5/8 | 11 3/8 | 1 15/16 | 4 1/8 | C8 x 11.5 | 36 | 2 1/8 | 3 | 2 7/16 |
| 17 | 354 | 1 3/4 | | 18 1/8 | | | | 4 | | | | | 1 15/16 |
| 18 | 690 | 2 | 9 | 18 1/4 | 12 3/4 | 15 7/8 | 2 3/4 | 4 | C12 x 20.7 | 42 | 2 5/8 | 3 | 2 9/16 |
| 19 | 783 | 2 1/4 | | 20 1/2 | | | | 4 1/8 | | | | | 2 5/8 |
| 20 | 993 | 2 1/2 | 10 | 23 3/4 | 12 3/4 | 16 7/8 | 3 5/8 | 4 1/8 | C15 x 33.9 | 40 | 2 7/8 | 3 | 2 11/16 |
| 21 | 1,197 | 2 3/4 | 10 | 27 3/16 | | | | 4 5/16 | | | | | 3 1/8 |
| 22 | 1,496 | 3 | 11 | 33 3/8 | 12 3/4 | 16 7/8 | 3 5/8 | 4 3/8 | C15 x 33.9 | 48 | 3 3/8 | 3 | 3 3/4 |

* Weight based on 24" center-to-center dimension



SPRING HANGERS

FIG. 82, C-82 SHORT SPRING: DIMENSIONS (IN) • WEIGHT (LBS)

| Hanger Size | Rod Size A | R. H. Thread Length | Casing | | Flange Dia. D | Min Thread Engage F | Z | Rod Take Out By Type | | | | Type A Thread Depth G | Types B, C | | | | | Type D | | |
|-------------|------------|---------------------|----------|--------|---------------|---------------------|--------|----------------------|----------|-------|---------|-----------------------|---------------|-----------|-------|-------------------|---------|--------------|--------------|-----------------|
| | | | Length B | Dia. C | | | | A | B,C | E | G | | Lug Hole Size | Pin Hgh H | R | Clevris Opening S | Thk. T | Rod Length Y | Nut Allow. K | Height Spacer M |
| | | | | | | | | | | | | | | | | | | | | |
| 0 | | | | | | | 15/16 | 45/16 | 6 1/4 | | 1 | | | | | | | 7 1/2 | | |
| 1 | 1/2 | 3 | 4 3/4 | 4 | 5 1/8 | 15/16 | 11/16 | 4 1/16 | 6 | 2 1/8 | 3/4 | 7/16 | 1 1/16 | 1 1/2 | 1 1/4 | 7/8 | 1/4 | 7 3/4 | 1 1/4 | 1 3/4 |
| 2 | | | 5 3/8 | | | | 1 1/16 | 5 1/16 | 7 | | 1 1/8 | | | | | | 8 3/8 | | | |
| 3 | | | 5 1/4 | | | | 9/16 | 4 7/16 | 6 3/8 | | 5/8 | | | | | | 7 7/8 | | | |
| 4 | 1/2 | 3 | 5 1/4 | 5 9/16 | 6 15/16 | 15/16 | 1 3/16 | 5 1/16 | 7 | 2 1/8 | 1 1/4 | 7/16 | 1 1/16 | 1 1/2 | 1 1/4 | 7/8 | 1/4 | 8 1/4 | 1 1/4 | 1 3/4 |
| 5 | | | 5 3/8 | | | | 1 1/16 | | | | 1 1/8 | | | | | | 8 5/8 | | | |
| 6 | | | 5 13/16 | | | | 1 3/16 | 5 1/16 | 7 3/16 | | 1 1/8 | | | | | | 9 1/16 | | | |
| 7 | 5/8 | 3 | 6 1 1/16 | 6 5/8 | 8 3/8 | 15/16 | 1 1/16 | 6 3/16 | 8 5/16 | 2 1/8 | 2 1/8 | 5/8 | 1 3/16 | 1 1/2 | 1 1/4 | 1 1/16 | 1/4 | 9 11/16 | 1 1/2 | 1 3/4 |
| 8 | | | | | | | 1 3/16 | 5 15/16 | 8 1/16 | | 1 1/8 | | | | | | 9 15/16 | | | |
| 9 | | | 7 1/4 | | | | 1 1/8 | 6 1/8 | 8 5/8 | | 1 1/8 | | | | | | 11 1/4 | | | |
| 10 | 3/4 | 4 | 8 1/4 | 8 5/8 | 10 3/4 | 1 1/4 | 1 3/8 | 7 3/8 | 9 7/8 | 2 | 2 1/8 | 1 | 1 5/16 | 1 1/2 | 1 1/4 | 1 1/4 | 3/8 | 11 3/4 | 1 3/4 | 1 3/4 |
| 11 | | | 7 1/4 | | | | 1 3/16 | 6 3/16 | 8 11/16 | | 1 15/16 | | | | | | 10 7/16 | | | |
| 12 | | | 7 1/4 | | | | 7/8 | 6 3/16 | 8 11/16 | | 1 1/8 | | | | | | 11 1/4 | | | |
| 13 | 1 1/4 | 4 | 8 3/4 | 8 5/8 | 10 3/4 | 1 1/4 | 1 | 7 3/8 | 10 3/8 | 2 | 2 3/4 | 1 | 1 1/4 | 2 | 1 1/2 | 1 5/8 | 1/2 | 12 5/8 | 2 1/4 | 1 3/4 |
| 14 | 1 1/4 | | 8 7/8 | | | | 3/4 | 7 3/8 | 11 3/8 | | 2 1/2 | | 1 1/2 | 3 | 2 | 2 | 5/8 | 13 5/8 | 3 | |
| 15 | 1 1/4 | 4 | 8 7/8 | | 10 3/4 | 1 1/4 | 3/4 | 7 3/8 | 11 3/8 | 2 | 2 1/2 | 1 | 1 1/2 | | 2 | 2 | 5/8 | 14 1/8 | 3 | |
| 16 | 1 1/2 | 5 | 10 5/8 | 8 5/8 | 11 3/8 | 1 15/16 | 2 | 9 5/16 | 13 11/16 | 6 | 1 1/16 | 1 3/8 | 1 3/4 | 3 | 2 1/2 | 2 3/8 | 3/4 | 15 7/8 | 3 1/2 | 1 3/4 |
| 17 | 1 3/4 | 6 | 11 1/8 | | | | | 10 9/16 | 14 15/16 | | 2 1/16 | | 2 | | | 2 5/8 | | 17 5/8 | 4 | |
| 18 | 2 | 7 | 13 | | | | 2 1/2 | 10 11/16 | 16 13/16 | | 7/16 | | 2 3/8 | 4 | | 2 7/8 | 3/4 | 19 3/16 | 4 9/16 | |
| 19 | 2 1/4 | | 14 | 12 3/4 | 15 7/8 | 2 3/4 | 2 3/16 | 11 3/4 | 18 3/8 | 6 | 1 | 2 1/4 | 2 5/8 | | 3 | 3 1/8 | 3/4 | 20 5/8 | 5 | 1 3/4 |
| 20 | 2 1/2 | 8 | 16 1/8 | | | | 2 1/16 | 14 | 20 5/8 | | 1 1/8 | | 2 7/8 | 4 1/2 | 4 | 3 3/8 | 1 | 23 3/16 | 5 9/16 | |
| 21 | 2 3/4 | 9 | 18 | | | | | 13 5/8 | 20 7/8 | | 3/8 | 2 3/4 | 3 1/8 | 4 1/2 | | 3 5/8 | | 25 | 6 1/4 | 1 1/4 |
| 22 | 3 | 10 | 22 1/4 | 12 3/4 | 16 7/8 | 3 5/8 | 2 3/4 | 17 5/8 | 25 3/8 | 7 | 2 3/8 | 3 | 3 3/8 | 5 | 4 | 3 7/8 | 1 | 29 5/8 | 6 5/8 | 1 3/4 |

| Hanger Size | Type F | | | | | | | | | | Type G | | | | Weight | | | |
|-------------|------------------|-------------|---------------|-------|----------------|-------------|------------|--------|-----------------------|----------|----------------------------|----|-------|-----|--------|-------|-----|-----|
| | E' Bottom Flange | | Bottom Flange | | Load Col. Dia. | Load Flange | Length X ■ | | Channel Size (lbs/ft) | Max C-C | Space Between Channels - W | P | Type | | | | | |
| | Size Sq. | Bolt Circle | | Bolts | | | Thick | Dia. | | | | | Thick | Min | Max | A,B,C | D,E | F |
| | | Min | Max | | | | | | | | | | | | | | | |
| 0 | | | | | | | | | | | | | 6 | 5 | 11 | 27 | | |
| 1 | 7 1/2 | 7 | 8 3/4 | 5/8 | 1/4 | 1.900 | 3 7/8 | 3 1/16 | 6 5/16 | 6 13/16 | C3 x 4.1 | 24 | 5/8 | 3/4 | 7 | 6 | 11 | 29 |
| 2 | | | | | | | | | 6 15/16 | 7 7/16 | | | | | 8 | 7 | 12 | |
| 3 | | | | | | | | | 6 7/8 | 7 7/8 | C3 x 4.1 | 30 | 3/4 | 3/4 | 11 | 10 | 10 | 33 |
| 4 | 7 1/2 | 7 | 8 3/4 | 3/4 | 1/4 | 2.875 | 5 5/8 | 3 1/16 | 7 | 7 1/2 | | | | | 12 | 11 | 20 | 35 |
| 5 | | | | | | | | | 7 | | | | | | 13 | 12 | 21 | 36 |
| 6 | | | | | | | | | 7 1/2 | 8 | | | | | 20 | 19 | 33 | 51 |
| 7 | 9 | 8 | 10 7/8 | 3/4 | 3/8 | 3.50 | 6 3/8 | 1/4 | 8 3/8 | 8 7/8 | C3 x 4.1 | 36 | 1 | 3/4 | 23 | 22 | 35 | 57 |
| 8 | | | | | | | | | | | | | | | 24 | 23 | 36 | 59 |
| 9 | | | | | | | | | 8 15/16 | 9 15/16 | | | | | 56 | 52 | 78 | 125 |
| 10 | 13 1/4 | 10 1/16 | 16 1/2 | 3/4 | 1/2 | 4.50 | 8 3/8 | 1/2 | 9 15/16 | 10 15/16 | C4 x 5.4 | 36 | 1 1/4 | 1 | 62 | 58 | 84 | 137 |
| 11 | | | | | | | | | 8 15/16 | 9 15/16 | | | | | 55 | 51 | 76 | 121 |
| 12 | | | | | | | | | 8 15/16 | 9 15/16 | | | | | 58 | 53 | 78 | 132 |
| 13 | 13 1/4 | 10 1/16 | 16 1/2 | 3/4 | 1/2 | 4.50 | 8 3/8 | 1/2 | 10 7/16 | 11 7/16 | C5 x 6.7 | 36 | 1 1/2 | 1 | 69 | 63 | 81 | 154 |
| 14 | | | | | | | | | 10 9/16 | 11 9/16 | | 33 | | | 72 | 55 | 91 | 159 |
| 15 | | | | | | 4.50 | | | 10 9/16 | 11 9/16 | C6 x 10.5 | | 1 1/2 | | 88 | 79 | 100 | 198 |
| 16 | 13 1/4 | 10 1/16 | 16 1/2 | 3/4 | 1/2 | 2.00 | 8 3/8 | 1/2 | 12 5/8 | 13 5/8 | C8 x 11.5 | 36 | 2 1/8 | 1 | 102 | 91 | 112 | 230 |
| 17 | | | | | | | | | 13 3/8 | 14 3/8 | | | | | 120 | 105 | 126 | 266 |
| 18 | | | | | | | | | 15 1/16 | 16 1/16 | | | | | 259 | 226 | 270 | |
| 19 | 17 1/4 | 15 3/4 | 22 | 3/4 | 5/8 | 2.50 | 12 1/2 | 1/2 | 16 1/16 | 17 1/16 | | | | | 286 | 246 | 275 | |
| 20 | | | | | | | | | 18 3/16 | 19 3/16 | | | | | 350 | 302 | 344 | |
| 21 | | | | | | | | | 20 1/8 | 21 1/8 | | | | | 401 | 339 | 348 | |
| 22 | 17 1/4 | 15 3/4 | 22 | 3/4 | 5/8 | 3.00 | 12 1/2 | 1/2 | 24 3/8 | 25 3/8 | | | | | 490 | 431 | 443 | |

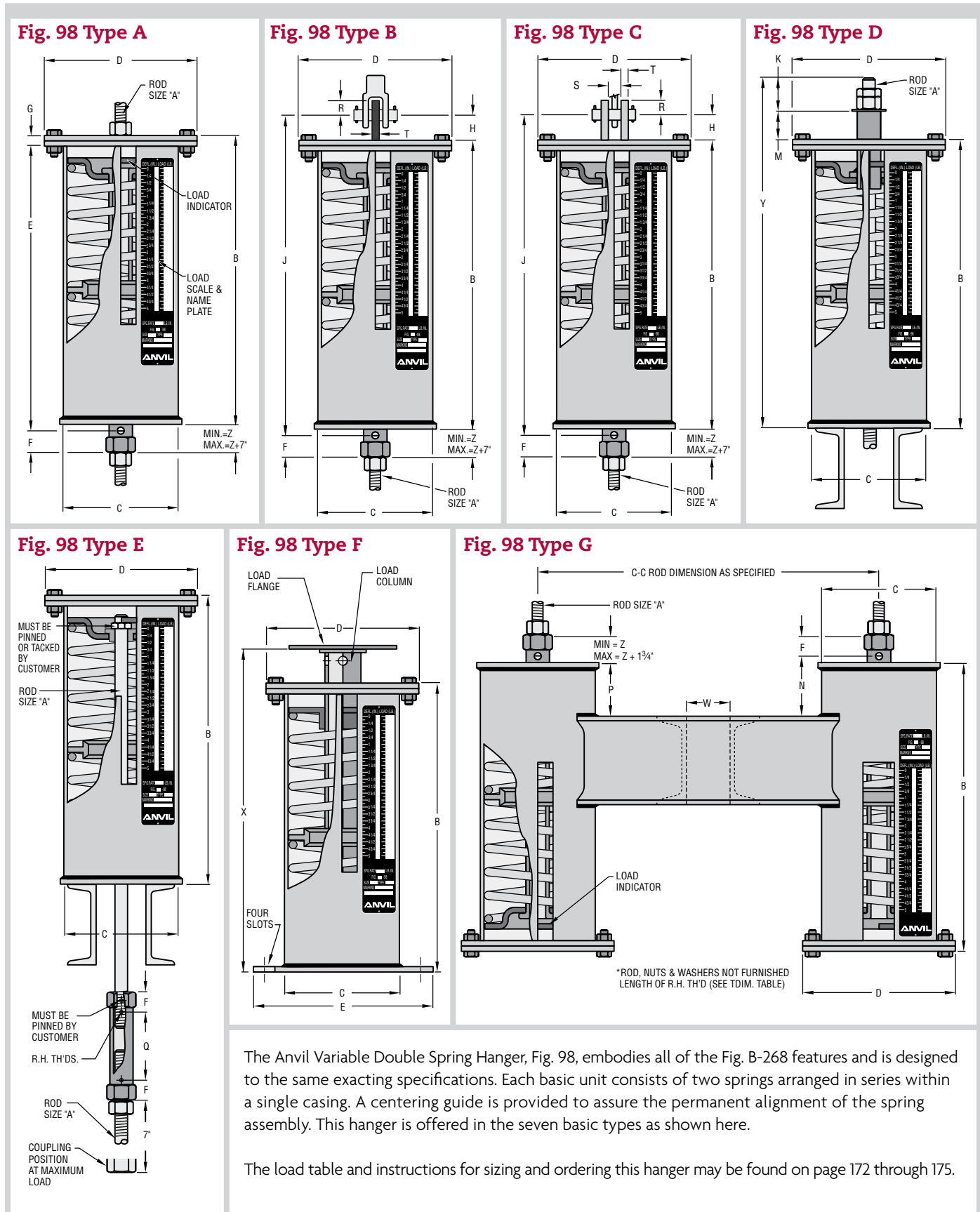
■ Hanger take-out or installed height. With pipe movement up, cold to hot, installed height should be the mid point between the minimum and maximum "X" dimension, plus thickness of load flange. With pipe movement down, cold to hot installed height should be mid-point between the minimum and maximum "X" dimension, plus the amount of vertical movement and load flange thickness. (Type F only).

* Weight based on 24" center-to-center dimension. See page 180 for Type F roller and guided load column information. Attachment rods and nuts not furnished.



Fig. 98, C-98

Double Spring



SPRING HANGERS

FIG. 98, C-98 DOUBLE SPRING: DIMENSIONS (IN) • WEIGHT (LBS)

| Hanger Size | Rod Size A | R.H. Thread Length | Casing | | Flange Dia. D | Min. Thread Engage F | Z | Rod Take Out By Type | | | | Type A | Types B, C | | | | | Type D | | |
|-------------|-------------------------------|--------------------|----------------------------------|--------------------------------|---------------------------------|---------------------------------|--------------------------------|----------------------------------|----------------------------------|----|---------------------------------|-------------------------------|--------------------------------|-------------------------------|-------------------------------|--------------------------------|--------|----------------------------------|--------------------------------|-------------------------------|
| | | | Length B | Dia. C | | | | A | B, C | E | G | Thread Depth G | Lug Hole Size | Pin Hgt H | R | Clevlis Opening S | Thk. T | Rod Length Y | Nut Allow. K | Height Spacer M |
| | | | | | | | | E | J | Q | N | | | | | | | | | |
| 0 | | | 12 ⁵ / ₈ | | | | 1 ⁵ / ₁₆ | 12 ³ / ₁₆ | 14 ¹ / ₈ | | 1 ¹ / ₂ | | | | | | | 19 ³ / ₈ | | |
| 1 | 1/2 | 9 | 14 ³ / ₈ | 4 | 5 ¹ / ₈ | 1 ⁵ / ₁₆ | 1 ⁵ / ₁₆ | 13 ¹⁵ / ₁₆ | 15 ⁷ / ₈ | 9 | 1 ¹ / ₂ | 7/16 | 1 ¹ / ₁₆ | 1 ¹ / ₂ | 1 ¹ / ₄ | 7/8 | 1/4 | 21 ¹ / ₈ | 1 ¹ / ₄ | 5 ¹ / ₂ |
| 2 | | | 15 ⁷ / ₈ | | | | 1 ¹ / ₁₆ | 15 ¹⁵ / ₁₆ | 17 ¹ / ₈ | | 1 ¹ / ₄ | | | | | | | 22 ¹ / ₂ | | |
| 3 | 1/2 | 9 | 14 | 5 ⁹ / ₁₆ | 6 ¹⁵ / ₁₆ | 1 ⁵ / ₁₆ | 1 ³ / ₁₆ | 13 ⁷ / ₁₆ | 15 ³ / ₈ | 9 | 1 ⁷ / ₈ | 7/16 | 1 ¹ / ₁₆ | 1 ¹ / ₂ | 1 ¹ / ₄ | 7/8 | 1/4 | 20 ³ / ₄ | 1 ¹ / ₄ | 5 ¹ / ₂ |
| 4 | | | 15 ¹ / ₄ | | | | 1 ³ / ₁₆ | 15 ³ / ₁₆ | 17 ⁷ / ₈ | | 2 ³ / ₈ | | | | | | | 22 | | |
| 5 | | | 16 ³ / ₈ | | | | 1 ¹ / ₁₆ | 15 ¹⁵ / ₁₆ | 17 ⁷ / ₈ | | 1 ³ / ₄ | | | | | | | 23 ³ / ₈ | | |
| 6 | 5/8 | 9 | 16 ¹¹ / ₁₆ | 6 ³ / ₈ | 8 ³ / ₈ | 1 ⁵ / ₁₆ | 1 ³ / ₁₆ | 15 ¹⁵ / ₁₆ | 18 ¹ / ₁₆ | 9 | 1 ⁷ / ₈ | 5/8 | 1 ³ / ₁₆ | 1 ¹ / ₂ | 1 ¹ / ₄ | 1 ¹ / ₁₆ | 1/4 | 23 ¹¹ / ₁₆ | 1 ¹ / ₂ | 5 ¹ / ₂ |
| 7 | | | 18 ³ / ₈ | | | | 1 ¹ / ₈ | 18 ³ / ₁₆ | 20 ⁹ / ₁₆ | | 2 ³ / ₁₆ | | | | | | | 25 ⁵ / ₈ | | |
| 8 | | | 19 ⁹ / ₁₆ | | | | 1 ¹ / ₁₆ | 18 ¹¹ / ₁₆ | 20 ¹³ / ₁₆ | | 1 ³ / ₄ | | | | | | | 26 ⁹ / ₁₆ | | |
| 9 | 3/4 | 9 | 20 ³ / ₁₆ | 8 ⁵ / ₈ | 10 ³ / ₄ | 1 ¹ / ₄ | 1 ⁵ / ₁₆ | 18 ⁷ / ₈ | 21 ³ / ₈ | 9 | 2 ¹¹ / ₁₆ | 1 | 1 ⁵ / ₁₆ | 1 ¹ / ₂ | 1 ¹ / ₄ | 1 ¹ / ₄ | 3/8 | 27 ⁷ / ₁₆ | 1 ³ / ₄ | 5 ¹ / ₂ |
| 10 | | | 22 ⁵ / ₈ | | | | 1 | 21 ³ / ₈ | 23 ⁷ / ₈ | | 2 ³ / ₄ | | | | | | | 29 ⁷ / ₈ | | |
| 11 | | 10 | 18 ¹ / ₄ | | | | 7/8 | 16 ⁷ / ₈ | 19 ³ / ₈ | 12 | 2 ⁵ / ₈ | | | | | | | 25 ¹ / ₂ | | |
| 12 | 1 | 10 | 19 ¹ / ₂ | 8 ⁵ / ₈ | 10 ³ / ₄ | 1 ¹ / ₄ | 5/8 | 17 ⁷ / ₈ | 20 ⁷ / ₈ | 12 | 3 ³ / ₈ | 1 | 1 ¹ / ₄ | 2 | 1 ¹ / ₂ | 1 ⁵ / ₈ | 1/2 | 27 ¹ / ₄ | 2 ¹ / ₄ | 5 ¹ / ₂ |
| 13 | | | 24 ³ / ₄ | | | | 3/4 | 23 ¹ / ₄ | 26 ¹ / ₄ | | 3 ¹ / ₂ | | | | | | | 32 ³ / ₈ | | |
| 14 | 1 ¹ / ₄ | | 24 ⁷ / ₈ | | | | 1/2 | 23 ³ / ₈ | 27 ¹ / ₈ | | 3 ¹ / ₄ | | 1 ¹ / ₂ | 3 | 2 | 2 | 5/8 | 33 ³ / ₈ | 3 | |
| 15 | 1 ¹ / ₄ | 10 | 24 ⁷ / ₈ | | 10 ³ / ₄ | | 1/2 | 23 ³ / ₈ | 27 ¹ / ₈ | 12 | 3 ¹ / ₄ | 1 | 1 ¹ / ₂ | | 2 | 2 | 5/8 | 33 ³ / ₄ | 3 | |
| 16 | 1 ¹ / ₂ | 11 | 29 ⁷ / ₈ | 8 ⁵ / ₈ | 11 ³ / ₈ | 1 ¹⁵ / ₁₆ | 2 | 28 ⁹ / ₁₆ | 32 ¹⁵ / ₁₆ | 7 | 4 ¹ / ₁₆ | 1 ³ / ₈ | 1 ³ / ₄ | 3 | 2 ¹ / ₂ | 2 ³ / ₈ | 3/4 | 38 ⁷ / ₈ | 3 ¹ / ₂ | 5 ¹ / ₂ |
| 17 | 1 ³ / ₄ | 12 | 34 | | | | 2 ¹ / ₈ | 32 ¹³ / ₁₆ | 37 ³ / ₁₆ | | 4 ³ / ₁₆ | | 2 | | | | | 2 ⁵ / ₈ | 3/4 | |
| 18 | 2 | 12 | 33 ³ / ₄ | 12 ³ / ₄ | 15 ¹ / ₈ | 2 ³ / ₄ | 2 ¹ / ₁₆ | 31 ¹ / ₈ | 37 ³ / ₁₆ | 7 | 4 ¹ / ₈ | 2 ¹ / ₄ | 2 ³ / ₈ | 4 | 3 | 2 ⁷ / ₈ | 3/4 | 43 ³ / ₁₆ | 4 ⁹ / ₁₆ | 5 ¹ / ₂ |
| 19 | 2 ¹ / ₄ | 13 | 37 ³ / ₄ | | | | 2 ⁹ / ₁₆ | 35 ¹ / ₂ | 42 ¹ / ₈ | | 4 | | 2 ⁵ / ₈ | | | | | 4 ¹ / ₂ | 3 | |
| 20 | 2 ¹ / ₂ | 14 | 44 ¹ / ₄ | 12 ³ / ₄ | 16 ⁷ / ₈ | 3 ⁵ / ₈ | 2 ¹ / ₁₆ | 42 ¹ / ₈ | 48 ³ / ₄ | 7 | 4 ¹ / ₈ | 2 ³ / ₄ | 2 ⁷ / ₈ | 4 ¹ / ₂ | 4 | 3 ⁵ / ₈ | 1 | 55 ³ / ₁₆ | 5 ⁹ / ₁₆ | 5 ¹ / ₂ |
| 21 | 2 ³ / ₄ | 14 | 49 ³ / ₈ | | | | 2 ¹ / ₁₆ | 45 ¹ / ₁₆ | 52 ¹ / ₁₆ | | 3 ⁵ / ₁₆ | | 2 ³ / ₄ | | | | | 3 ¹ / ₈ | 4 ¹ / ₂ | |
| 22 | 3 | 15 | 62 | | | | 3 ¹ / ₂ | 58 ¹ / ₈ | 66 ¹ / ₈ | | 4 ¹ / ₈ | 3 | 3 ³ / ₈ | 5 | | 3 ⁵ / ₈ | 1 | 73 ¹ / ₈ | 6 ⁵ / ₈ | |

| Hanger Size | Type F | | | | | | | | | | Type G | | | | Weight | | | | | | |
|-------------|------------------|-------------|---------------|-----|----------------|-------------|--------|------------|----------------------------------|----------------------------------|------------|----------------------------|-------|-------|------------|-------|-------|-------|-----|-----|-----|
| | E' Bottom Flange | | Bottom Flange | | Load Col. Dia. | Load Flange | | Length X ■ | | Channel Size (lbs/ft) | Max C-C | Space Between Channels - W | P | Type | | | | | | | |
| | Size Sq. | Bolt Circle | Min | Max | | Bolts | Thick | Dia. | Thick | | | | | Min | Max | A,B,C | D,E | F | G* | | |
| 0 | | | | | | | | | | | | | | | | | | 12 | 12 | 20 | 37 |
| 1 | 7 1/2 | 7 | 8 3/4 | 5/8 | 1/4 | 1.90 | 3 7/8 | 3 1/16 | 14 ³ / ₁₆ | 16 ³ / ₁₆ | C3 x 4.1 | 24 | 5/8 | 1 1/2 | 14 | 14 | 21 | 41 | | | |
| 2 | | | | | | | | | 15 ¹⁵ / ₁₆ | 17 ¹⁵ / ₁₆ | | | | | 16 | 16 | 23 | 45 | | | |
| 3 | 7 1/2 | 7 | 8 3/4 | 3/4 | 1/4 | 2.88 | 5 3/4 | 3 1/16 | 15 ⁵ / ₈ | 17 ⁵ / ₈ | C3 x 4.1 | 30 | 3/4 | 2 | 22 | 21 | 35 | 55 | | | |
| 4 | | | | | | | | | 16 ³ / ₈ | 18 ⁷ / ₈ | | | | | 25 | 24 | 39 | 61 | | | |
| 5 | | | | | | | | | 18 ¹ / ₄ | 20 ¹ / ₄ | | | | | 27 | 26 | 41 | 65 | | | |
| 6 | 9 | 8 | 10 7/8 | 3/4 | 3/8 | 3.50 | 6 3/8 | 1/4 | 18 ³ / ₈ | 20 ³ / ₈ | C3 x 4.1 | 36 | 1 | 2 | 41 | 40 | 62 | 93 | | | |
| 7 | | | | | | | | | 20 ⁵ / ₁₆ | 22 ⁵ / ₁₆ | | | | | 49 | 48 | 72 | 109 | | | |
| 8 | | | | | | | | | 21 ¹ / ₄ | 23 ¹ / ₄ | | | | 61 | 52 | 75 | 133 | | | | |
| 9 | 13 1/4 | 10 1/16 | 16 1/2 | 3/4 | 1/2 | 4.50 | 8 3/8 | 1/2 | 21 ⁷ / ₈ | 23 ³ / ₈ | C4 x 5.4 | 36 | 1 1/4 | 2 | 97 | 94 | 136 | 207 | | | |
| 10 | | | | | | | | | 24 ⁵ / ₁₆ | 26 ⁵ / ₁₆ | | | | | 114 | 108 | 150 | 241 | | | |
| 11 | | | | | | | | | 19 ¹⁵ / ₁₆ | 21 ¹⁵ / ₁₆ | | | | 96 | 95 | 134 | 209 | | | | |
| 12 | 13 1/4 | 10 1/16 | 16 1/2 | 3/4 | 1/2 | 4.50 | 8 3/8 | 1/2 | 21 ³ / ₁₆ | 23 ³ / ₁₆ | C5 x 6.7 | 36 | 1 1/2 | 3 | 108 | 104 | 144 | 223 | | | |
| 13 | | | | | | | | | 26 ⁷ / ₁₆ | 28 ⁷ / ₁₆ | | | | | 144 | 139 | 181 | 305 | | | |
| 14 | | | | | | | | | 26 ⁹ / ₁₆ | 28 ⁹ / ₁₆ | | | | | 153 | 147 | 188 | 323 | | | |
| 15 | 13 1/4 | 10 1/16 | 16 1/2 | 3/4 | 1/2 | 4.50 | 8 3/8 | 1/2 | 26 ⁹ / ₁₆ | 28 ⁹ / ₁₆ | C6 x 10.5 | 36 | 1 1/2 | 3 | 172 | 163 | 201 | 368 | | | |
| 16 | | | | | | | | | 31 ⁷ / ₈ | 33 ⁷ / ₈ | | | | | 218 | 202 | 241 | 462 | | | |
| 17 | | | | | | 2.00 | | | 36 | 38 | C8 x 11.5 | 36 | 2 1/8 | 3 | 273 | 247 | 287 | 572 | | | |
| 18 | 17 1/4 | 15 3/4 | 22 | 3/4 | 5/8 | 2.50 | 12 1/2 | 1/2 | 35 ⁵ / ₁₆ | 37 ⁵ / ₁₆ | | | | | C12 x 20.7 | 42 | 2 3/8 | 3 | 512 | 477 | 550 |
| 19 | | | | | | | | | 39 ¹³ / ₁₆ | 41 ¹³ / ₁₆ | 600 | 548 | 624 | 1,231 | | | | | | | |
| 20 | | | | | | | | | 46 ⁵ / ₁₆ | 48 ⁵ / ₁₆ | 802 | 723 | 807 | 1,633 | | | | | | | |
| 21 | 17 1/4 | 15 3/4 | 22 | 3/4 | 5/8 | 3.00 | 12 1/2 | 1/2 | 51 ⁷ / ₈ | 53 ⁷ / ₈ | C15 x 33.9 | 48 | 3 3/8 | 3 | 940 | 845 | 872 | 1,965 | | | |
| 22 | | | | | | | | | 64 | 66 | | | | | 1,240 | 1,140 | 1,184 | 2,566 | | | |

■ Hanger take-out or installed height. With pipe movement up, cold to hot, installed height should be the mid point between the minimum and maximum "X" dimension, plus thickness of load flange. With pipe movement down, cold to hot installed height should be mid-point between the minimum and maximum "X" dimension, plus the amount of vertical movement and load flange thickness. (Type F only).

* Weight based on 24" center-to-center dimension. See page 180 for Type F roller and guided load column information. Attachment rods and nuts not furnished.



SPRING HANGERS

Triple Spring, Triple Spring-GR

Triple Type A

MIN. = Z
MAX. = Z + 10 1/2"
ROD SIZE "A"

Triple Type B

MIN. = Z
MAX. = Z + 10 1/2"
ROD SIZE "A"

Triple Type C

MIN. = Z
MAX. = Z + 10 1/2"
ROD SIZE "A"

Triple Type D

MIN. = Z
MAX. = Z + 10 1/2"
ROD SIZE "A"

Triple Type E

MUST BE PINNED OR TACKED BY CUSTOMER

ROD SIZE "A"

Triple Type F

LOAD FLANGE

LOAD INDICATOR

LOAD SCALE & NAME PLATE

FOUR SLOTS

Triple Type G

C-C ROD DIMENSION AS SPECIFIED
NOT TO EXCEED C-C MAX

ROD SIZE "A"

MIN = Z
MAX = Z + 3 1/2"

LOAD INDICATOR

LOAD SCALE & NAME PLATE

Triple Type E (continued)

MUST BE PINNED BY CUSTOMER

R.H. TH'DS.

ROD SIZE "A"

COUPLING POSITION AT MAXIMUM LOAD

The Anvil Variable Triple Spring Hanger embodies all of the Fig. B-268 features and is designed to the same exacting specifications. Each basic unit consists of three springs arranged in series within a single casing. A centering guide is provided to assure the permanent alignment of the spring assembly. This hanger is offered in the seven basic types as shown here.

The load table and instructions for sizing and ordering this hanger may be found on page 172 through 175.

Triple Spring, Triple Spring-GR

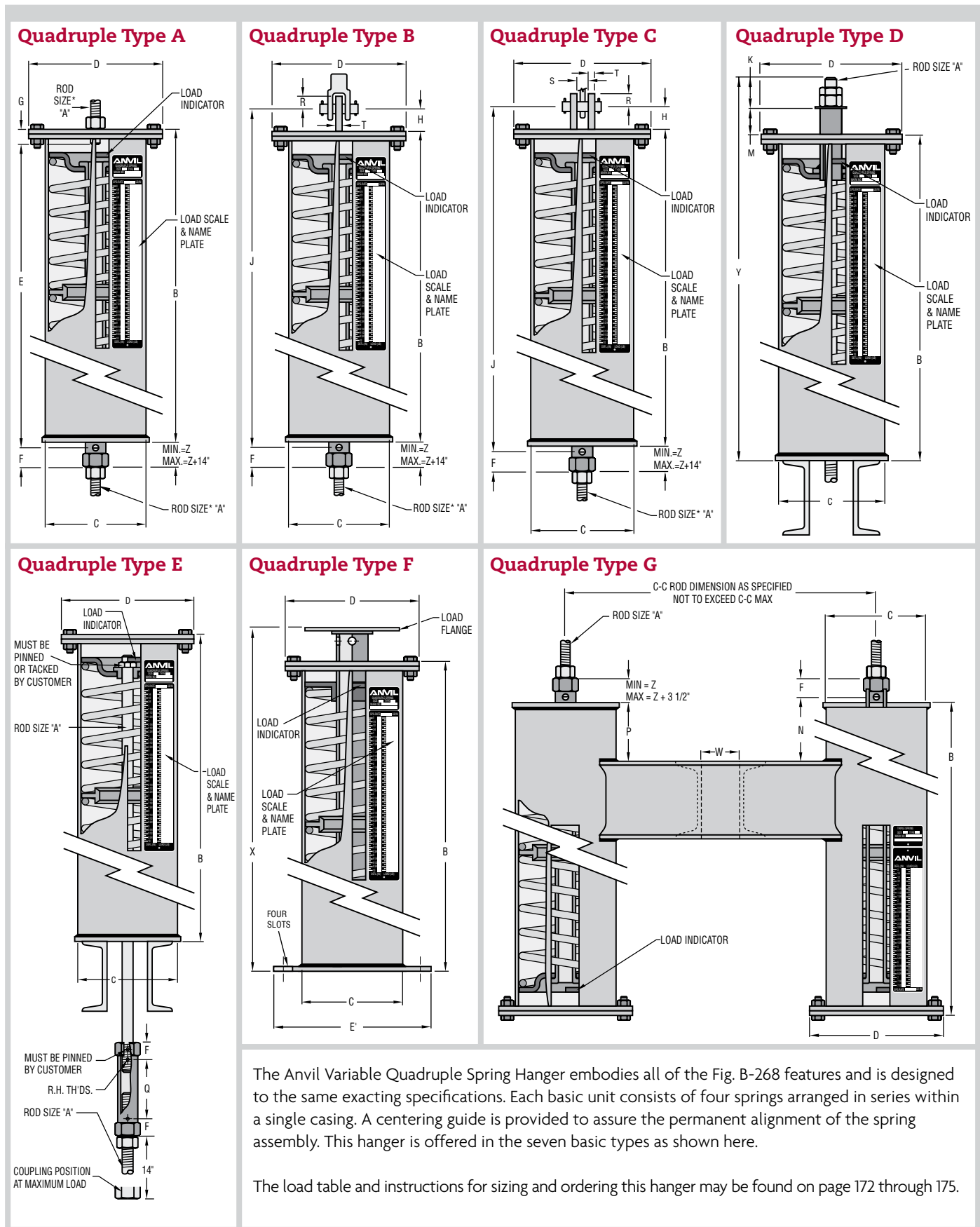
| TRIPLE SPRING: DIMENSIONS (IN) | | | | | | | | | | | | | | | | | | | |
|--------------------------------|--------------------|--------------------|-----------------|---------------|--------------|--------|------------------------|-----------|-----------|----------|-------|----------------|--------|----------|---------------------|----------|--------|----------|----------|
| Hanger Size | General Dimensions | | | | | | Rod Take Out For Types | | | | | Type A | Type D | | Type F | | Type G | | |
| | Rod Size A | R.H. Thread Length | Casing Length B | Casing Dia. C | Min Thread F | Z | A | B & C | D | E | G | Depth Thread G | K | M | Loaded Length Dim X | | P | | |
| | | | | | | | E | J | Y | Q | N | | | | Min | Max | | | |
| 0 | 1/2 | 12 | 19 1/8 | 4 | 1 5/16 | 1 5/16 | 19 1/8 | 20 5/8 | 28 1/8 | 11 1/8 | 1 1/2 | 7/16 | 1 1/4 | 7 3/4 | 20 15/16 | 22 15/16 | 1 1/2 | | |
| 1 | | | 21 3/4 | | | | 23 1/4 | 30 3/4 | 23 3/16 | | | | | | 25 1/2 | 33 | | 23 9/16 | 25 9/16 |
| 2 | | | 24 | | | | 25 15/16 | 27 9/16 | 29 9/16 | | | | | | 31 1/8 | 26 15/16 | | 28 15/16 | |
| 3 | 1/2 | 12 | 21 3/16 | 5 9/16 | 1 5/16 | 1 5/16 | 21 3/16 | 22 1 1/16 | 30 3/16 | 11 1/8 | 2 | 7/16 | 1 1/4 | 7 3/4 | 23 | 25 | 2 | | |
| 4 | | | 23 1/16 | | | | 24 9/16 | 32 1/16 | 23 1/8 | | | | | | 26 7/8 | 26 15/16 | | 28 15/16 | |
| 5 | | | 25 1/8 | | | | 26 5/8 | 34 1/8 | 26 5/16 | | | | | | 28 5/16 | 28 15/16 | | 28 15/16 | |
| 6 | 5/8 | 12 | 25 | 6 5/8 | 1 5/16 | 1 5/16 | 25 | 26 1/2 | 34 3/16 | 11 1/8 | 2 | 5/8 | 1 1/2 | 7 1 1/16 | 26 15/16 | 28 15/16 | 2 | | |
| 7 | | | 27 15/16 | | | | 29 1/16 | 37 1/8 | 27 15/16 | | | | | | 30 13/16 | 38 1/2 | | 29 7/8 | 31 7/8 |
| 8 | | | 29 5/16 | | | | 30 13/16 | 38 1/2 | 29 5/16 | | | | | | 30 13/16 | 38 1/2 | | 31 1/4 | 33 1/4 |
| 9 | 3/4 | 13 | 29 9/16 | 8 5/8 | 1 1/4 | 1 1/4 | 29 9/16 | 31 1/16 | 38 7/8 | 11 1/2 | 3 | 1 | 1 3/4 | 7 9/16 | 31 5/8 | 33 5/8 | 3 | | |
| 10 | | | 33 1/4 | | | | 34 3/4 | 42 9/16 | 33 1/4 | | | | | | 34 3/4 | 42 9/16 | | 35 5/16 | 37 5/16 |
| 11 | | | 26 11/16 | | | | 28 3/16 | 36 | 26 11/16 | | | | | | 28 3/16 | 36 | | 28 3/4 | 30 3/4 |
| 12 | 1 | 13 | 28 9/16 | 8 5/8 | 1 1/4 | 1 1/4 | 28 9/16 | 30 9/16 | 38 3/8 | 11 1/2 | 3 7/8 | 1 | 2 1/4 | 7 9/16 | 30 5/8 | 32 5/8 | 4 | | |
| 13 | | | 36 1/4 | | | | 38 1/4 | 46 1/16 | 36 1/4 | | | | | | 38 1/4 | 46 1/16 | | 38 5/16 | 40 1/16 |
| 14 | | | 36 3/4 | | | | 39 5/8 | 47 5/16 | 36 3/4 | | | | | | 39 5/8 | 47 5/16 | | 38 13/16 | 40 13/16 |
| 15 | 1 1/4 | 14 | 36 5/8 | 8 5/8 | 1 3/8 | 1 1/4 | 36 5/8 | 39 1/2 | 47 3/16 | 10 9/16 | 4 | 1 3/8 | 3 | 7 9/16 | 38 11/16 | 40 11/16 | 4 | | |
| 16 | 1 1/2 | 15 | 44 1/16 | | | | 47 1/16 | 54 5/8 | 11 1/16 | 46 1/8 | | | | | 48 1/8 | | | | |
| 17 | 1 3/4 | | 50 1/4 | | | | 53 1/4 | 61 5/16 | 11 9/16 | 52 5/16 | | | | | 54 5/16 | | | | |
| 18 | 2 | 16 | 49 7/8 | 12 3/4 | 2 3/4 | 2 3/4 | 49 7/8 | 53 7/8 | 60 1 1/16 | 10 7/8 | 4 | 2 1/4 | 4 9/16 | 7 | 51 5/16 | 53 5/16 | 4 | | |
| 19 | 2 1/4 | | 55 7/8 | | | | 60 3/8 | 67 7/8 | 11 7/16 | 58 1/16 | | | | | 60 1/16 | | | | |
| 20 | 2 1/2 | | 65 5/8 | | | | 70 7/8 | 78 3/16 | 11 15/16 | 67 13/16 | | | | | 69 13/16 | | | | |
| 21 | 2 3/4 | 17 | 73 5/16 | 12 3/4 | 3 5/8 | 3 5/8 | 73 5/16 | 76 13/16 | 87 7/8 | 11 | 4 | 2 3/4 | 6 1/4 | 9 5/16 | 75 7/16 | 77 7/16 | 4 | | |
| 22 | 3 | 18 | 91 1/2 | | | | 95 1/2 | 106 7/16 | 11 1/2 | 93 5/8 | | | | | 95 5/8 | | | | |

Attachment rods and nuts not furnished.
See page 180 for Type F roller and guided load column information.

See Fig. B-268 for dimensions not listed

SPRING HANGERS

Quadruple Spring, Quadruple Spring-CR



Quadruple Spring, Quadruple Spring-CR

| QUADRUPLE SPRING: DIMENSIONS (IN) | | | | | | | | | | | | | | | | | |
|-----------------------------------|--------------------|--------------------|-----------------|---------------|--------------|--------|------------------------|-----------|----------|--------|-------|----------------|----------|--------|---------------------|----------|--------|
| Hanger Size | General Dimensions | | | | | | Rod Take Out For Types | | | | | Type A | Type D | | Type F | | Type G |
| | Rod Size A | R.H. Thread Length | Casing Length B | Casing Dia. C | Min Thread F | Z | A | B & C | D | E | G | Depth Thread G | K | M | Loaded Length Dim X | | P |
| | | | | | | | E | J | Y | Q | N | | | | Min | Max | |
| 0 | 1/2 | 16 | 25 1/8 | 4 | 1 5/16 | 1 5/16 | 25 1/8 | 26 5/8 | 37 1/8 | 15 1/8 | 1 1/2 | 7/16 | 1 1/4 | 7 3/4 | 26 15/16 | 28 15/16 | 1 1/2 |
| 1 | | | 28 5/8 | | | | 30 1/8 | 40 5/8 | 30 7/16 | | | | | | 32 7/16 | | |
| 2 | | | 31 1/8 | | | | 33 1/8 | 43 3/8 | 33 7/16 | | | | | | 35 7/16 | | |
| 3 | 1/2 | 16 | 27 7/8 | 5 9/16 | 1 5/16 | 1 5/16 | 27 7/8 | 29 3/8 | 39 7/8 | 15 1/8 | 2 | 7/16 | 1 1/4 | 7 3/4 | 29 11/16 | 31 11/16 | 2 |
| 4 | | | 30 3/8 | | | | 31 7/8 | 42 3/8 | 32 3/16 | | | | | | 34 3/16 | | |
| 5 | | | 33 3/8 | | | | 34 5/8 | 45 1/8 | 34 15/16 | | | | | | 36 15/16 | | |
| 6 | 5/8 | 16 | 32 15/16 | 6 5/8 | 1 5/16 | 1 5/16 | 32 15/16 | 34 7/16 | 45 1/8 | 15 1/8 | 2 | 5/8 | 1 1/2 | 7 9/16 | 34 7/8 | 36 7/8 | 2 |
| 7 | | | 36 7/8 | | | | 38 3/8 | 49 1/16 | 38 13/16 | | | | | | 40 13/16 | | |
| 8 | | | 38 11/16 | | | | 40 3/16 | 50 7/8 | 40 5/8 | | | | | | 42 5/8 | | |
| 9 | 3/4 | 16 | 38 13/16 | 8 5/8 | 1 1/4 | 1 1/4 | 38 13/16 | 40 5/16 | 51 1/8 | 15 1/2 | 3 | 1 | 1 3/4 | 7 1/16 | 40 7/8 | 42 7/8 | 3 |
| 10 | | | 43 3/4 | | | | 45 1/4 | 56 1/16 | 45 13/16 | | | | | | 47 13/16 | | |
| 11 | | 17 | 35 | | | | 35 | 36 1/2 | 47 5/16 | | | | 37 1/16 | | 39 1/16 | | |
| 12 | 1 | 17 | 37 1/2 | 8 5/8 | 1 1/4 | 1 1/4 | 37 1/2 | 39 1/2 | 50 5/16 | 15 1/2 | 3 7/8 | 1 | 2 1/4 | 7 1/16 | 39 9/16 | 41 9/16 | 4 |
| 13 | | | 47 3/4 | | | | 49 3/4 | 60 9/16 | 49 13/16 | | | | 51 13/16 | | | | |
| 14 | | | 1 1/4 | | | | 48 3/8 | 51 1/4 | 61 15/16 | | | | 50 7/16 | | 52 7/16 | | |
| 15 | 1 1/4 | 18 | 48 1/8 | 8 5/8 | 1 3/8 | 1 1/4 | 48 1/8 | 51 | 61 15/16 | 15 1/2 | 4 | 1 3/8 | 3 | 7 1/16 | 50 3/16 | 52 3/16 | 4 |
| 16 | 1 1/2 | | 57 7/8 | | 60 7/8 | | 71 1/16 | 59 15/16 | 61 15/16 | | | | | | | | |
| 17 | 1 3/4 | | 19 | | 66 1/8 | | 69 1/8 | 80 3/16 | 68 3/16 | | | | 70 3/16 | | | | |
| 18 | 2 | 19 | 64 1/8 | 12 3/4 | 2 3/4 | 2 3/4 | 64 1/8 | 68 1/8 | 78 11/16 | 14 7/8 | 4 | 2 1/4 | 4 9/16 | 7 | 66 5/16 | 68 5/16 | 4 |
| 19 | 2 1/4 | | 20 | | | | 73 1/8 | 77 5/8 | 88 1/8 | | | | 75 5/16 | | 77 5/16 | | |
| 20 | 2 1/2 | | 86 1/8 | | | | 90 5/8 | 101 11/16 | 88 5/16 | | | | 90 5/16 | | | | |
| 21 | 2 3/4 | 21 | 95 7/8 | 12 3/4 | 3 5/8 | 3 5/8 | 95 7/8 | 99 3/8 | 113 3/16 | 15 | 4 | 2 3/4 | 6 1/4 | 9 5/16 | 98 | 100 | 4 |
| 22 | 3 | | 120 7/8 | | | | 124 1/8 | 138 7/16 | 122 1/4 | | | | | | 124 1/4 | | |

Attachment rods and nuts not furnished.
See page 180 for Type F roller and guided load column information.

See Fig. B-268 for dimensions not listed

Fig. 868

Angular Motion Spring

Size Range: 000 through 19 available

Design Features:

- Spring rates are equal to values for B-268 load tables
- The variable support has a total allowable travel range of 3½ inches.
- Working range min/max refer to the spring's load table chart.
- Assembly provides 2 inch of field adjustment in either direction.
- Self-aligned bushings permits +/- 5 degree misalignment or angular motion.
- Design virtually eliminates resultant forces and is free of friction forces.
- Allows minimum field welding.
- See catalog for more information in the spring hanger section.

Operating Temperatures:

- All components are suitable for operation of 400°F.
- The spring coils are suitable for operation at 300°F.
- Pipe clamps are suitable for operating piping temperatures as follows:
 - ASTM A 36 Carbon Steel - 650°F
 - ASTM A 516 GR. 65 Carbon Steel - 800°F
 - ASTM A 387 GR. 22 Alloy - 1075°F
 - Note: stainless steel pipe clamps available upon request.

Ordering: Specify figure number, assembly size based on hot (operating) load, cold (theoretical) load or movement and direction, extension piece, rear bracket(s), and pipe clamp size and material.

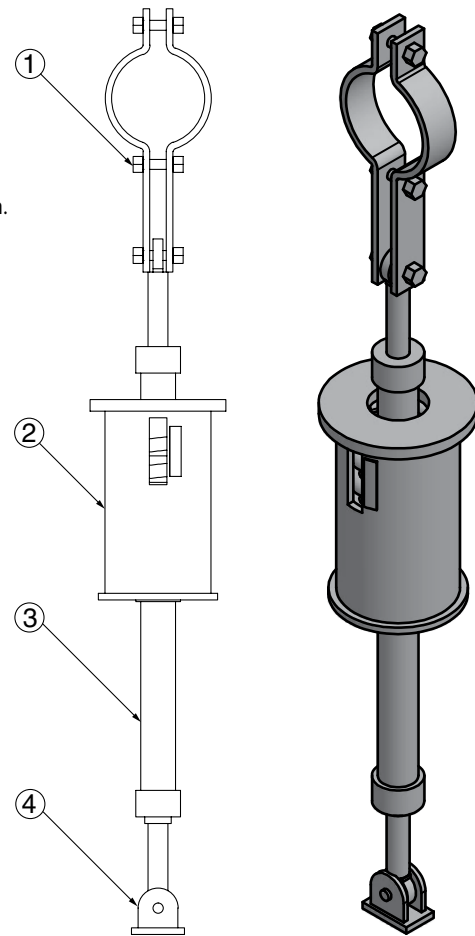
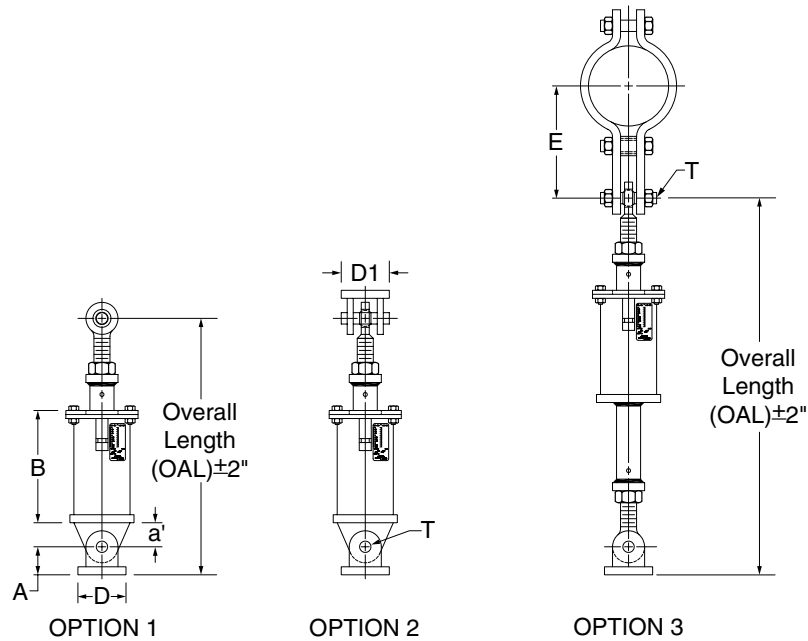


FIG. 868 ANGULAR MOTION SPRING

| | |
|---|---|
| 1 | Pipe Clamp Assembly - "E-Take out Values" |
| 2 | Spring Size determined with hot and cold loads |
| 3 | Extension Piece available - Sizes A, C, 2, 4, and 5 from Figure 211 with selected spring size |
| 4 | Rear Bracket is determined by item 2 |

Fig. 868

Angular Motion Spring (cont.)



| FIG. 868: DIMENSIONS (IN) | | | | | | | | | |
|---------------------------|----------------------------|-------|-------|----------------------------|--------|-------|---------------------------|-------|----------|
| Spring Size | Extension Piece (Fig. 211) | A | a' | B | D | D1 | E | T | OAL Max. |
| 000 - 5 | A | 1 | 3/4 | Refer to B Dimension Table | 2 | 1 1/4 | Refer to E-Take Out Table | 3/8 | 50 1/2 |
| 6 - 13 | C | 2 1/2 | 1 3/4 | | | 2 3/8 | | 3/4 | 80 |
| 14 - 16 | 2 | | 2 7/8 | | 1 | 98 | | | |
| 17 & 18 | 4 | 3 | 2 1/4 | | 3 3/16 | | | 1 1/4 | |
| 19 | 5 | | 2 3/4 | 6 1/8 | 4 1/4 | 1 1/2 | | | |

| B DIMENSIONS (IN) | |
|-------------------|-----------------|
| Spring Size | Casing Length B |
| 000 | 5 5/8 |
| 00 | 7 9/16 |
| 0 | 6 11/16 |
| 1 | 7 9/16 |
| 2 | 8 5/16 |
| 3 | 7 15/16 |
| 4 | |
| 5 | 8 5/8 |
| 6 | 8 13/16 |
| 7 | 10 |
| 8 | |
| 9 | 10 7/16 |
| 10 | 12 1/8 |
| 11 | 10 7/16 |
| 12 | |
| 13 | 13 3/8 |
| 14 | 13 1/4 |
| 15 | |
| 16 | 16 1/16 |
| 17 | 18 1/8 |
| 18 | 18 1/4 |
| 19 | 20 1/2 |

| E-TAKE OUT | | | | | | | | | | |
|------------|--------------------------------------|--------|--------|--------|--------|-----------------------|--------|--------|--------|--------|
| Pipe Size | E-Take Out: Dimensions (in) at 650°F | | | | | E Dimension at 1075°F | | | | |
| | A | C | 2 | 4 | 5 | A | C | 2 | 4 | 5 |
| 3/4 | 2 7/16 | - | - | - | - | 8 | - | - | - | - |
| 1 | 2 9/16 | - | - | - | - | 8 1/8 | - | - | - | - |
| 1 1/4 | 2 11/16 | - | - | - | - | 8 1/4 | - | - | - | - |
| 1 1/2 | 4 1/8 | - | - | - | - | 8 3/8 | - | - | - | - |
| 2 | 5 1/8 | 6 3/8 | 6 3/8 | - | - | 8 5/8 | 9 3/8 | 9 3/8 | - | - |
| 2 1/2 | 5 3/8 | 7 | 7 | - | - | 8 7/8 | 9 3/8 | 9 3/8 | - | - |
| 3 | 5 15/16 | | | - | - | 9 1/8 | 9 3/8 | 9 3/8 | - | - |
| 3 1/2 | 6 3/16 | | | - | - | 9 3/8 | 9 3/8 | 9 3/8 | - | - |
| 4 | 6 1/2 | | | 7 1/4 | 7 1/4 | - | 9 3/8 | 9 3/8 | 9 3/8 | - |
| 5 | 7 3/4 | 7 3/4 | 7 3/4 | 9 3/8 | 10 | 10 1/4 | 10 1/4 | 10 1/4 | - | - |
| 6 | 8 3/8 | 8 3/8 | 8 3/8 | 10 | | 10 3/4 | 10 3/4 | 10 3/4 | 10 3/4 | 11 1/8 |
| 8 | 9 3/8 | 9 3/8 | 9 3/8 | 11 1/4 | | 11 1/4 | 11 3/4 | 11 3/4 | 11 3/4 | 12 3/8 |
| 10 | 10 1/2 | 10 1/2 | 10 1/2 | 12 3/4 | | 12 3/4 | 12 3/4 | 12 3/4 | 12 3/4 | 13 3/8 |
| 12 | - | 11 7/8 | 11 7/8 | 13 3/8 | 13 3/8 | - | 13 3/4 | 13 3/4 | 13 3/4 | 14 3/4 |
| 14 | - | 12 3/8 | 12 3/8 | 14 1/2 | 14 1/2 | - | 14 3/8 | 14 3/8 | 14 3/8 | 15 3/8 |
| 16 | - | 13 3/8 | 13 3/8 | 15 1/4 | 15 1/4 | - | 15 3/8 | 15 3/8 | 15 3/8 | 16 3/8 |
| 18 | - | 14 5/8 | 14 5/8 | 16 3/8 | 16 3/8 | - | 16 3/8 | 16 3/8 | 16 1/2 | 18 |
| 20 | - | 15 3/4 | 15 3/4 | 17 3/4 | 17 3/4 | - | 17 3/8 | 17 3/8 | 17 1/2 | 19 3/8 |
| 24 | - | 18 1/8 | 18 1/8 | 19 7/8 | 19 7/8 | - | 19 3/8 | 19 3/8 | 20 3/8 | 21 1/2 |
| 30 | - | 21 1/4 | 21 1/4 | 23 | 23 | - | 22 3/8 | 22 3/8 | 23 1/2 | 24 1/2 |
| 36 | - | 24 | 24 | 26 1/2 | 26 1/2 | - | 25 3/8 | 25 3/8 | 26 5/8 | 27 1/2 |

CONSTANT SUPPORTS

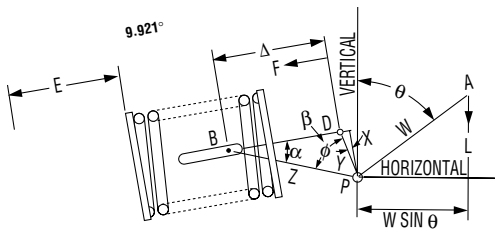
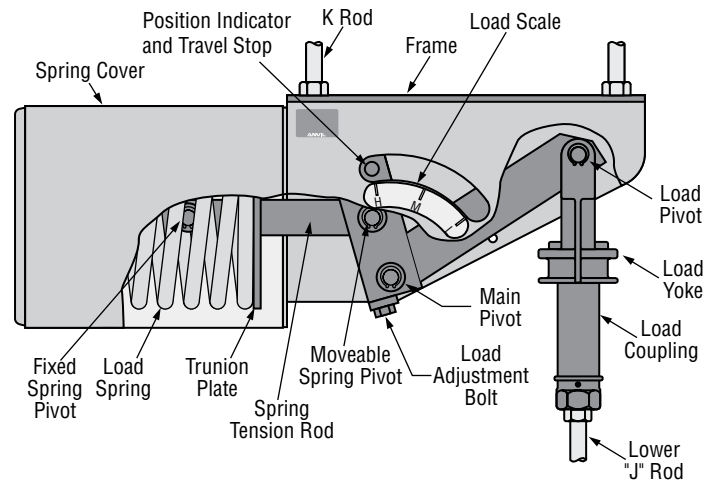
Model R

Mathematically Perfect Pipe Support

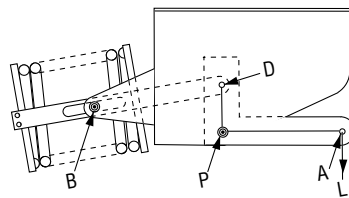
The exclusive geometric design of Anvil Model R Constant Support Hanger assures perfectly constant support through the entire deflection of the pipe load. This counter-balancing of the load and spring moments about the main pivot is obtained by the use of carefully designed compression type load springs, lever, and spring tension rods.

As the lever moves from the high to the low position, the load spring is compressed and the resulting increasing force acting on the decreasing spring moment arm creates a turning moment about the main pivot which is exactly equal and opposite to the turning moment of the load and load moment arm.

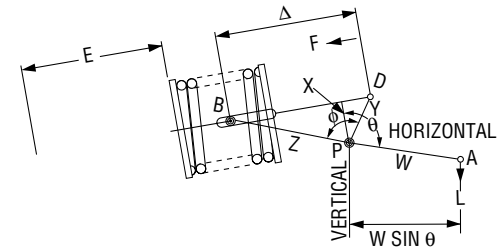
As the lever moves from the low to the high position, the load spring is increasing in length and the resulting decreasing force acting on the increasing spring moment arm creates a turning moment about the main pivot which is exactly equal and opposite to the turning moment of the load and load moment arm.



High Position



Middle Position



Low Position

$$(1) \frac{\sin \alpha}{Y} = \frac{\sin \phi}{\Delta} \quad \sin \beta = \frac{X}{Y}$$

$$\frac{\sin \alpha}{Y} = \frac{\sin \beta}{Z} \quad \sin \alpha = \frac{X}{Z}$$

$$\sin \alpha = \frac{Y \sin \beta}{Z}$$

Substituting in (1), we have (2) $\frac{X}{YZ} = \frac{\sin \phi}{\Delta}$ and (3) $X = \frac{YZ \sin \phi}{\Delta}$

The load "L" is suspended from the lever at point "A" and at any point within the load travel range the moment of the load about the main lever-pivot "P" is equal to the load times its moment arm, thus:

(4) Load moment = $L(W \sin \theta)$, where $(W \sin \theta)$ is the load moment arm

The spring is attached at one of its ends to the fixed pivot "B". The spring's free end is attached by means of a rod to the lever-pivot "D". This spring arrangement provides a spring moment about the main lever-pivot "P" which opposes the load moment and is equal to the spring force "F" times its moment arm; thus:

$$(5) \text{ Spring Moment} = F \left(\frac{YZ \sin \phi}{\Delta} \right),$$

where $\left(\frac{YZ \sin \phi}{\Delta} \right)$ is the spring moment arm

The spring force "F" is equal to the spring constant "K" times the spring deflection "E"; thus:

(6) $F = KE$; Therefore equation (5) may be written as:

$$(7) \text{ Spring Moment} = KE \left(\frac{YZ \sin \phi}{\Delta} \right)$$

To obtain perfect constant support the load moment must always equal the spring moment. Therefore:

$$(8) LW \sin \phi = \left(\frac{KEYZ \sin \phi}{\Delta} \right)$$

By proper design " ϕ " and " θ " are made equal. Therefore, equation (8) maybe written as:

$$(9) LW = \left(\frac{KEYZ}{\Delta} \right)$$

The spring and the rod are so arranged that the spring deflection "E" always equals the distance " Δ " between pivots "B" and "D". Therefore, equation (9) may be written as:

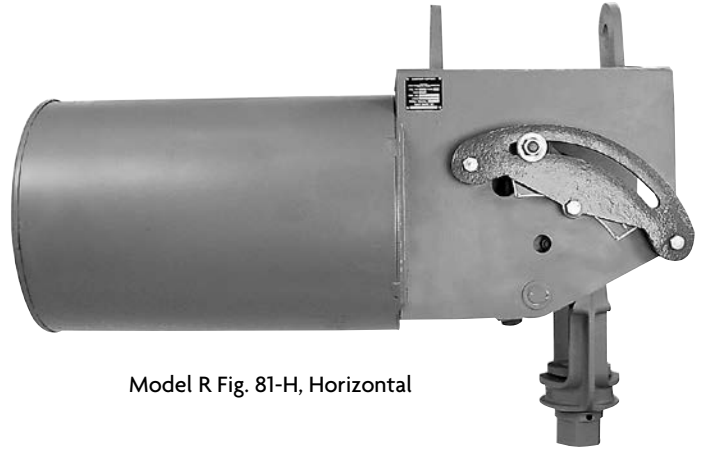
$$(10) LW = KYZ \text{ or, } (11) L = (KYZ)/W$$

Since equation (11) holds true for all positions of the load within its travel range and "K", "Y", "Z", and "W" remain constant it is therefore true that perfect constant support is obtained.

Model R Fig. 80-V, C-80-V Vertical Constant Support Model R Fig. 81-H, C-81-H Horizontal



Model R Fig. 80-V, Vertical



Model R Fig. 81-H, Horizontal

Finish: Standard finish; painted with semi gloss primer. Corrosion resistant; galvanized with coated coil or painted with CZ11 and coated coil.

Recommended Service: When piping stress is critical and pipe is subject to vertical movement in excess of 1/2" due to thermal expansion, and also at locations where it is necessary to avoid any transfer of stress from support or onto critical terminals or connecting equipment.

Approvals: WW-H-171E (Types 52, 58 and 59), ANSI/MSS SP-69 and MSS SP-58 (Types 54, 55 and 56).

Features:

- Because of exclusive geometric design, mathematically perfect constancy of support is maintained throughout the full range of load adjustment.
- Compactness – design provides smaller and more versatile units.
- Increased load and travel capacity.
- Each hanger is individually calibrated before shipment to support the exact load specified.
- All model R constant supports have a wide range of load adjustability. No less than 10% of this adjustability is provided either side of the calibrated load.
- White button marked "C" denotes cold setting of hanger; red button marked "H" denotes hot or operating setting.
- Field load adjustment is made by turning the single load adjustment bolt.
- Covered spring provides protection and good appearance.
- J-rod swings at least 4° from vertical.
- Non-resonant to all vertical vibrations.

Size Range: Anvil Model R constant support hangers are made in two basic designs, 80-V (vertical design) and 81-H (horizontal design). Combined, the 80-V and 81-H constant supports are made in nine different frame sizes and 110 spring sizes to accommodate travels from 1 1/2" to 20" and loads from 27 lbs to 87,500 lbs.

Single rod suspension: Available in Types A, B and C, Fig. 80-V (see page 200 through 202) and Fig. 81-H (see page 208 through 210).

How to select hanger sizes: Determine the total load to be supported by the hanger as well as the actual travel – that is, the actual vertical movement of the pipe at the point of hanger location. Refer to the Load-Travel table for constant support hangers (see page 196 through 199) and select a size hanger which will accommodate the known load and actual travel. It must be noted that the travel shown in the table is a total travel – that is, the maximum vertical movement which the hanger will accommodate. The total travel of the hanger should always be greater than the calculated travel of pipe line to allow for some discrepancy between calculated travel and actual travel.

It is suggested that the total travel for constant supports should be equal to "actual travel" plus 1" or 20% whichever is greater.

How to determine type: After the size of the constant support is determined, consideration of available room for suspending the pipe and hanger will indicate whether a vertical (80-V series, page 200 - 207) or horizontal (81-H series, page 208 - 214) hanger is desirable.

How to determine design: After the hanger size and design are determined, the type of constant support to be used depends upon the physical installation required by the suspension problem, i.e., whether the hanger is to be installed above, between or below steel members (see line cuts referring to Types A, B, C, etc.). It will be noted that the Type F is made in horizontal design only and the type G is made in the vertical design only. **Special constant support hangers can be fabricated for unusual conditions.**

J-rod and K-hole diameter: Tapping or drilling for standard rod size will be furnished as shown in the J-rod and K-hole selection charts unless otherwise specified. Upper attachments, turnbuckles and clamps should be tapped to agree with the rod as shown in the selection chart. Standard rod diameters are based on the load to be carried by the upper rod which includes the weight of the hanger assembly as well as the pipe line. Tapped connections for hanger rod sizes 3" and smaller are UNC-Thread Series, Class 2 fit. 3 1/4" and large rod tappings are 8UN Series Threads.

Model R

(Continued)

Ordering: Specify:

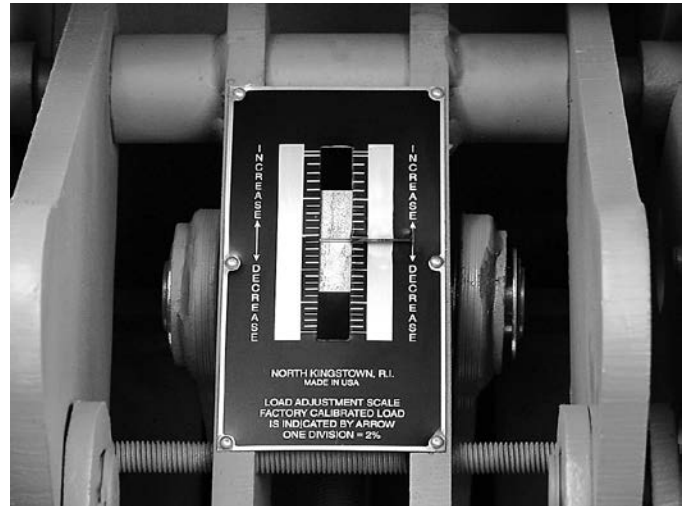
- (1) Hanger size number
- (2) Figure number
- (3) Type
- (4) Name of hanger
- (5) Loads to be supported (pounds)
- (6) Total travel (inches)
- (7) Actual travel (inches)
- (8) Direction of movement "cold to hot"
- (9) Customer's hanger mark.
- (10) When ordering Type G, specify C-C rod dimension as well as load per spring and total load.
- (11) For Types A, B, C, Fig. 81-H when required specify "for single rod suspension."
- (12) Constant Support Hangers are also available corrosion-resistant as figures C-80-V and C-81-H.

Installation:

- (1) Securely attach the hanger to the building structure at a point where the load coupling is directly over the desired point of attachment to the pipe in the operating position.
- (2) Make certain that the moving parts of the hanger will be unobstructed.
- (3) Attach the lower J-rod between the pipe attachment and the load coupling. Make certain that the lower J-rod has enough thread engagement before taking up the load. A sight hole is provided for this.
- (4) Turn the load coupling, as you would a turnbuckle, until the travel indicator rotates to the desired cold setting (white button) marked "C" indicated on the position scale. If the constant support incorporates a travel stop see below.
- (5) After the line is in operation, check hanger for indicated hot setting. If necessary, make adjustment by turning the load coupling to bring the indicator to the hot position (red button) marked "H". No other adjustment is normally required since the load as calibrated at the factory is equal to the load specified to be supported.

Adjustment: When the hanger is installed, its supporting force should be in balance with the portion of the piping weight assigned to it. Each hanger is individually calibrated before shipment to support the exact load specified. All model "R" Constant Supports have a wide range of load adjustability. Special instructions for field recalibration of individual hangers may be obtained from Anvil representatives. No less than 10% adjustability is provided either side of the calibrated load for plus or minus field load adjustment. The percentage increase or decrease from the factory calibrated load should be carefully calculated. The calibrated load setting of each hanger is indicated by a die-stamp on the load adjustment scale. Load adjustments should be made from this reference point, with each division on the patented scale equal to 2% except sizes 84-110 where each division is valued at 1%. The load adjustment is made by turning the single load adjustment bolt. For example, a calibrated load of 3,000 pounds revised to 2,760 pounds is a decrease of 240 pounds. $240/3,000 = 8\%$. By turning the load adjusting bolt the arrow moves in the "Decrease" direction four divisions.

Note: Field Recalibration of load does not decrease total travel.



Load adjustment scale shown applies to size 1 through 83 only. The load adjustment scale for sizes 84 through 110, 1 division equals 1%.

Travel stop: The functional design of the Constant Support Hanger permits the incorporation of a travel stop that will lock the hanger against upward or downward movement for temporary conditions of underload or overload, such as may exist during erection, hydrostatic test or chemical clean-out. Anvil Constant Supports are designed for hydrostatic test load of at least 2 times the normal operating load for the Constant Support. The travel stop for sizes 19 - 110 consists of two plates, with matched serrations, attached to the hanger frame with two or more cap screws and with a socketed piece which engages the position indicator. It is installed at the factory to hold the hanger in the "cold" position. A series of serrations can be engaged to lock the hanger at any position along the total travel range. The travel stop, which is furnished only when specified, is painted red. The stop must be removed before the piping system is put into operation, but not before the hanger is installed and fully loaded. The travel stop is released by removing the cap screws. A tag marked "Caution" and containing instructions for removal of the travel stop is attached to the hanger.

Note: See installation procedures PE-217-80 for a travel stop description on sizes 1-18.



Model R

(Continued)

Model R lifting lugs:

To help alleviate the problem of lifting large size Constant Supports into position for installation, this product is available with lifting lugs (if requested) on sizes ten and larger.

Lifting Lugs (Figure 81-H): Not available on Type F.

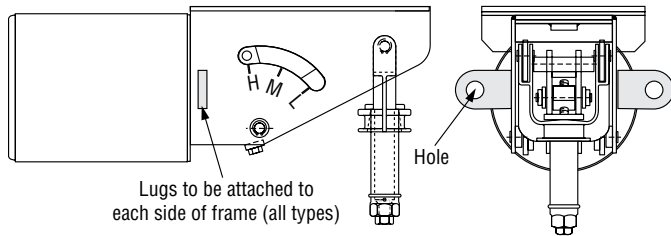
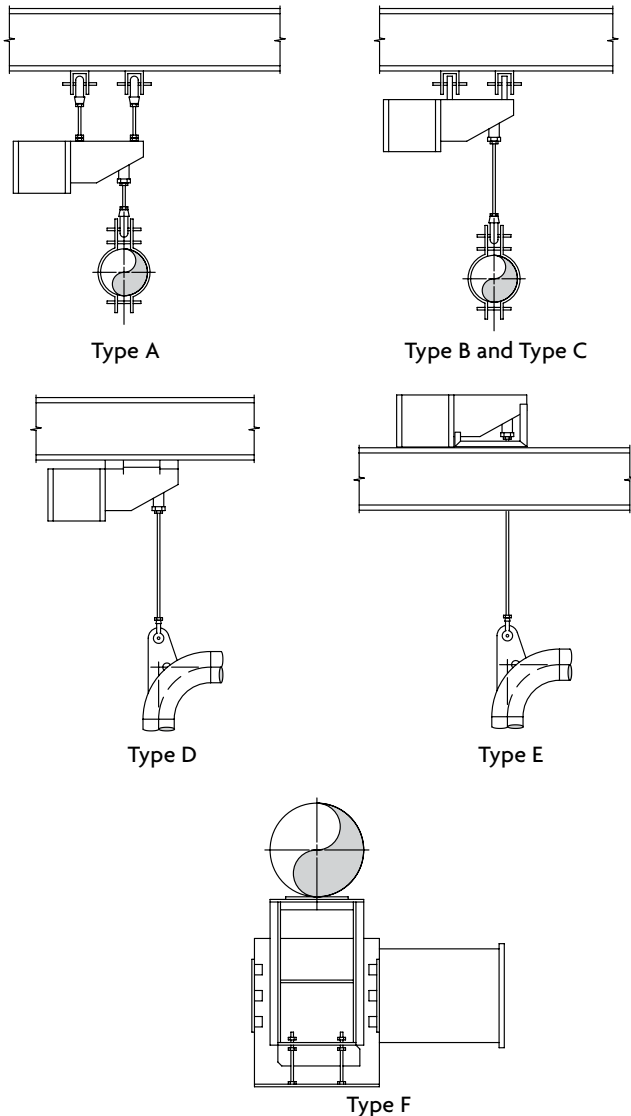


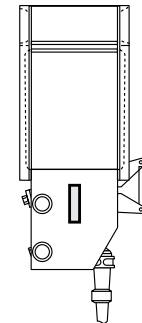
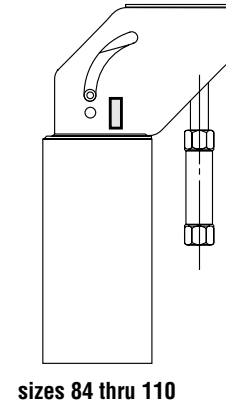
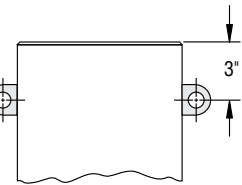
Fig. 81-H (Horizontal): Typical Applications



Lifting Lugs (Fig 80-V):

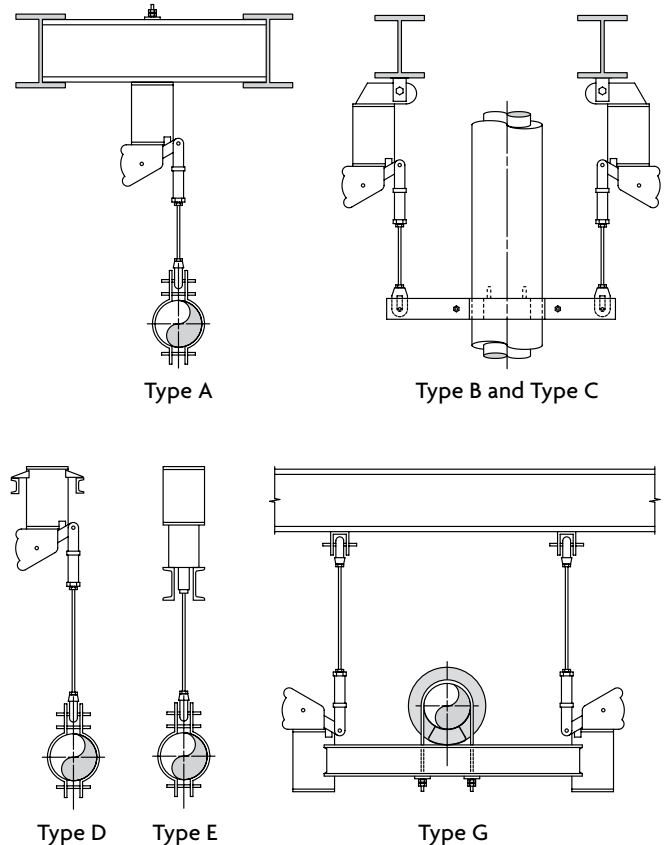
LUGS TO BE 90° FROM CHANNEL ON TYPE D

Types A, B, C, D, & E
sizes 10 thru 63



sizes 64 thru 83
Lugs to be attached to each side of frame and will need stabilizing rigging when being lifted

Fig. 80V (Vertical): Typical Applications



CONSTANT SUPPORTS

| Hanger Size No. | TOTAL TRAVEL* (IN); LOAD (LBS) SEE NOTES ON PAGE 199 | | | | | | | | | | | | | | |
|-----------------|--|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|-------|-------|
| | 1½ | 2 | 2½ | 3 | 3½ | 4 | 4½ | 5 | 5½ | 6 | 6½ | 7 | 7½ | 8 | 8½ |
| 1 | 144 | 108 | 86 | 72 | 62 | 54 | 48 | 43 | 39 | 36 | 33 | 31 | 29 | 27 | |
| | 173 | 130 | 104 | 87 | 74 | 65 | 58 | 52 | 47 | 43 | 40 | 37 | 35 | 33 | |
| 2 | 204 | 153 | 122 | 102 | 87 | 77 | 68 | 61 | 56 | 51 | 47 | 44 | 41 | 38 | |
| 3 | 233 | 175 | 140 | 117 | 100 | 88 | 78 | 70 | 64 | 58 | 54 | 50 | 47 | 44 | |
| 4 | 280 | 210 | 168 | 140 | 120 | 105 | 93 | 84 | 76 | 70 | 65 | 60 | 56 | 53 | |
| 5 | 327 | 245 | 196 | 163 | 140 | 123 | 109 | 98 | 89 | 82 | 75 | 70 | 65 | 61 | |
| 6 | 373 | 280 | 224 | 187 | 160 | 140 | 124 | 112 | 102 | 93 | 86 | 80 | 75 | 70 | |
| 7 | 451 | 338 | 270 | 225 | 193 | 169 | 150 | 135 | 123 | 113 | 104 | 97 | 90 | 85 | |
| 8 | 527 | 395 | 316 | 263 | 226 | 198 | 176 | 158 | 144 | 132 | 122 | 113 | 105 | 99 | |
| 9 | 600 | 450 | 360 | 300 | 257 | 225 | 200 | 180 | 164 | 150 | 138 | 129 | 120 | 113 | |
| 10 | 727 | 545 | 436 | 363 | 311 | 273 | 242 | 218 | 198 | 182 | 168 | 156 | 145 | 136 | |
| 11 | 851 | 638 | 510 | 425 | 365 | 319 | 284 | 255 | 232 | 213 | 196 | 182 | 170 | 160 | |
| 12 | 977 | 733 | 586 | 489 | 419 | 367 | 326 | 293 | 267 | 244 | 226 | 209 | 195 | 183 | |
| 13 | 1,177 | 883 | 706 | 589 | 505 | 442 | 392 | 353 | 321 | 294 | 272 | 252 | 235 | 221 | |
| 14 | 1,373 | 1,030 | 824 | 687 | 589 | 515 | 458 | 412 | 375 | 343 | 317 | 294 | 275 | 258 | |
| 15 | 1,573 | 1,180 | 944 | 787 | 674 | 590 | 524 | 472 | 429 | 393 | 363 | 337 | 315 | 295 | |
| 16 | 1,893 | 1,420 | 1,136 | 947 | 811 | 710 | 631 | 568 | 516 | 473 | 437 | 406 | 379 | 355 | |
| 17 | 2,217 | 1,663 | 1,330 | 1,109 | 950 | 832 | 739 | 665 | 605 | 554 | 512 | 475 | 443 | 416 | |
| 18 | 2,540 | 1,905 | 1,524 | 1,270 | 1,089 | 953 | 847 | 762 | 693 | 635 | 586 | 544 | 508 | 476 | |
| 19 | | 2,025 | 1,620 | 1,350 | 1,157 | 1,013 | 900 | 810 | 736 | 675 | 623 | 579 | 540 | 506 | 448 |
| | | | | | | | | | | | | | | | 476 |
| 20 | | 2,145 | 1,716 | 1,430 | 1,226 | 1,073 | 953 | 858 | 780 | 715 | 660 | 613 | 572 | 536 | 505 |
| 21 | | 2,335 | 1,868 | 1,557 | 1,334 | 1,168 | 1,038 | 934 | 849 | 778 | 718 | 667 | 623 | 584 | 549 |
| 22 | | 2,525 | 2,020 | 1,683 | 1,443 | 1,263 | 1,122 | 1,010 | 918 | 842 | 777 | 721 | 673 | 631 | 594 |
| 23 | | 2,710 | 2,168 | 1,807 | 1,549 | 1,355 | 1,204 | 1,080 | 985 | 903 | 834 | 775 | 723 | 678 | 638 |
| 24 | | 2,910 | 2,328 | 1,940 | 1,663 | 1,455 | 1,293 | 1,164 | 1,058 | 970 | 895 | 831 | 776 | 728 | 685 |
| 25 | | 3,110 | 2,488 | 2,073 | 1,777 | 1,555 | 1,382 | 1,244 | 1,131 | 1,037 | 957 | 889 | 829 | 778 | 732 |
| 26 | | 3,310 | 2,648 | 2,207 | 1,891 | 1,655 | 1,471 | 1,324 | 1,204 | 1,103 | 1,018 | 946 | 883 | 828 | 779 |
| 27 | | 3,630 | 2,904 | 2,420 | 2,074 | 1,815 | 1,613 | 1,452 | 1,320 | 1,210 | 1,117 | 1,037 | 968 | 908 | 854 |
| 28 | | 3,950 | 3,160 | 2,633 | 2,257 | 1,975 | 1,756 | 1,580 | 1,436 | 1,317 | 1,215 | 1,129 | 1,053 | 988 | 929 |
| 29 | | 4,270 | 3,416 | 2,847 | 2,440 | 2,135 | 1,898 | 1,708 | 1,553 | 1,423 | 1,314 | 1,220 | 1,139 | 1,068 | 1,005 |
| 30 | | 4,535 | 3,628 | 3,023 | 2,591 | 2,268 | 2,016 | 1,814 | 1,649 | 1,512 | 1,395 | 1,296 | 1,209 | 1,134 | 1,067 |
| 31 | | 4,795 | 3,836 | 3,197 | 2,740 | 2,398 | 2,131 | 1,918 | 1,744 | 1,598 | 1,475 | 1,370 | 1,279 | 1,199 | 1,128 |
| 32 | | 5,060 | 4,048 | 3,373 | 2,891 | 2,530 | 2,249 | 2,024 | 1,840 | 1,687 | 1,557 | 1,446 | 1,349 | 1,265 | 1,191 |
| 33 | | 5,295 | 4,236 | 3,530 | 3,026 | 2,648 | 2,353 | 2,118 | 1,925 | 1,765 | 1,629 | 1,513 | 1,412 | 1,324 | 1,246 |
| 34 | | 5,525 | 4,420 | 3,683 | 3,157 | 2,763 | 2,456 | 2,210 | 2,009 | 1,842 | 1,700 | 1,579 | 1,473 | 1,381 | 1,300 |
| 35 | | | 4,696 | 3,913 | 3,354 | 2,935 | 2,609 | 2,348 | 2,135 | 1,957 | 1,806 | 1,677 | 1,565 | 1,468 | 1,381 |
| 36 | | | 4,968 | 4,140 | 3,549 | 3,105 | 2,760 | 2,484 | 2,258 | 2,070 | 1,911 | 1,774 | 1,656 | 1,553 | 1,461 |
| 37 | | | 5,240 | 4,367 | 3,743 | 3,275 | 2,911 | 2,620 | 2,382 | 2,183 | 2,015 | 1,871 | 1,747 | 1,638 | 1,541 |
| 38 | | | 5,616 | 4,680 | 4,011 | 3,510 | 3,120 | 2,808 | 2,553 | 2,340 | 2,160 | 2,006 | 1,872 | 1,755 | 1,652 |
| 39 | | | 5,988 | 4,990 | 4,277 | 3,743 | 3,327 | 2,994 | 2,722 | 2,495 | 2,303 | 2,139 | 1,996 | 1,871 | 1,761 |
| 40 | | | 6,360 | 5,300 | 4,543 | 3,975 | 3,533 | 3,180 | 2,891 | 2,650 | 2,446 | 2,271 | 2,120 | 1,988 | 1,871 |
| 41 | | | 6,976 | 5,813 | 4,983 | 4,360 | 3,876 | 3,488 | 3,171 | 2,907 | 2,683 | 2,491 | 2,325 | 2,180 | 2,052 |
| 42 | | | 7,588 | 6,323 | 5,420 | 4,743 | 4,216 | 3,794 | 3,449 | 3,162 | 2,919 | 2,710 | 2,529 | 2,371 | 2,232 |
| 43 | | | 8,200 | 6,833 | 5,857 | 5,125 | 4,556 | 4,100 | 3,727 | 3,417 | 3,154 | 2,929 | 2,733 | 2,563 | 2,412 |
| 44 | | | 8,724 | 7,270 | 6,231 | 5,453 | 4,847 | 4,362 | 3,965 | 3,635 | 3,355 | 3,116 | 2,908 | 2,726 | 2,566 |
| 45 | | | 9,284 | 7,737 | 6,631 | 5,803 | 5,158 | 4,642 | 4,220 | 3,868 | 3,571 | 3,316 | 3,095 | 2,901 | 2,731 |
| 46 | | | 9,760 | 8,133 | 6,971 | 6,100 | 5,422 | 4,880 | 4,436 | 4,067 | 3,754 | 3,486 | 3,253 | 3,050 | 2,871 |
| 47 | | | 10,376 | 8,647 | 7,411 | 6,485 | 5,764 | 5,188 | 4,716 | 4,323 | 3,991 | 3,706 | 3,459 | 3,243 | 3,052 |
| 48 | | | 10,988 | 9,157 | 7,848 | 6,868 | 6,104 | 5,494 | 4,995 | 4,578 | 4,226 | 3,924 | 3,663 | 3,434 | 3,232 |
| 49 | | | 11,600 | 9,667 | 8,286 | 7,250 | 6,444 | 5,800 | 5,273 | 4,833 | 4,462 | 4,143 | 3,867 | 3,625 | 3,412 |
| 50 | | | | 10,367 | 8,886 | 7,775 | 6,911 | 6,220 | 5,655 | 5,183 | 4,785 | 4,443 | 4,147 | 3,888 | 3,659 |
| 51 | | | | 11,067 | 9,486 | 8,300 | 7,378 | 6,640 | 6,036 | 5,533 | 5,108 | 4,743 | 4,427 | 4,150 | 3,906 |
| 52 | | | | 11,847 | 10,154 | 8,885 | 7,898 | 7,108 | 6,462 | 5,923 | 5,468 | 5,077 | 4,739 | 4,443 | 4,181 |
| 53 | | | | 12,623 | 10,820 | 9,468 | 8,415 | 7,574 | 6,886 | 6,311 | 5,826 | 5,410 | 5,049 | 4,734 | 4,455 |
| 54 | | | | 13,400 | 11,486 | 10,050 | 8,933 | 8,040 | 7,309 | 6,700 | 6,185 | 5,743 | 5,360 | 5,025 | 4,730 |
| 55 | | | | 14,713 | 12,611 | 11,035 | 9,809 | 8,828 | 8,026 | 7,356 | 6,791 | 6,306 | 5,885 | 5,518 | 5,193 |
| 56 | | | | 16,023 | 13,734 | 12,018 | 10,682 | 9,614 | 8,740 | 8,011 | 7,396 | 6,867 | 6,409 | 6,009 | 5,655 |
| 57 | | | | 17,333 | 14,857 | 13,000 | 11,555 | 10,400 | 9,455 | 8,666 | 8,000 | 7,429 | 6,933 | 6,500 | 6,118 |
| 58 | | | | 18,423 | 15,791 | 13,818 | 12,282 | 11,054 | 10,049 | 9,211 | 8,503 | 7,896 | 7,369 | 6,809 | 6,503 |
| 59 | | | | 19,510 | 16,723 | 14,633 | 13,007 | 11,706 | 10,642 | 9,755 | 9,005 | 8,362 | 7,804 | 7,316 | 6,886 |
| 60 | | | | 20,600 | 17,657 | 15,450 | 13,733 | 12,360 | 11,236 | 10,300 | 9,508 | 8,829 | 8,240 | 7,725 | 7,271 |
| 61 | | | | 21,890 | 18,763 | 16,418 | 14,593 | 13,134 | 11,940 | 10,945 | 10,103 | 9,382 | 8,756 | 8,209 | 7,726 |
| 62 | | | | 23,176 | 19,665 | 17,383 | 15,451 | 13,906 | 12,642 | 11,588 | 10,697 | 9,933 | 9,270 | 8,691 | 8,180 |
| 63 | | | | 24,463 | 20,968 | 18,348 | 16,309 | 14,678 | 13,344 | 12,231 | 11,291 | 10,484 | 9,785 | 9,174 | 8,634 |
| "B" (avg. in.) | 1⅜ | 1⅞ | 2¼ | 2¾ | 3¼ | 3⅝ | 4⅛ | 4⅝ | 5⅛ | 5½ | 6 | 6½ | 6⅞ | 7⅜ | 7⅞ |

Table Continued on Facing Page

Shading in gray indicates this item is available upon request.

CONSTANT SUPPORTS

| Hanger Size No. | TOTAL TRAVEL* (IN); LOAD (LBS) SEE NOTES ON PAGE 199 | | | | | | | | | | | | | | | |
|-----------------|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|
| | 9 | 9½ | 10 | 10½ | 11 | 11½ | 12 | 12½ | 13 | 13½ | 14 | 14½ | 15 | 15½ | 16 | |
| 1 | | | | | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | |
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| 8 | | | | | | | | | | | | | | | | |
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| 16 | | | | | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | | | | |
| 19 | 423 | 401 | 381 | | | | | | | | | | | | | |
| | 450 | 426 | 405 | | | | | | | | | | | | | |
| 20 | 477 | 452 | 429 | | | | | | | | | | | | | |
| 21 | 519 | 492 | 467 | | | | | | | | | | | | | |
| 22 | 561 | 532 | 505 | | | | | | | | | | | | | |
| 23 | 602 | 571 | 542 | | | | | | | | | | | | | |
| 24 | 647 | 613 | 582 | | | | | | | | | | | | | |
| 25 | 691 | 655 | 622 | | | | | | | | | | | | | |
| 26 | 736 | 697 | 662 | | | | | | | | | | | | | |
| 27 | 807 | 764 | 726 | | | | | | | | | | | | | |
| 28 | 878 | 832 | 790 | | | | | | | | | | | | | |
| 29 | 949 | 899 | 854 | | | | | | | | | | | | | |
| 30 | 1,008 | 955 | 907 | | | | | | | | | | | | | |
| 31 | 1,066 | 1,009 | 959 | | | | | | | | | | | | | |
| 32 | 1,124 | 1,065 | 1,012 | | | | | | | | | | | | | |
| 33 | 1,177 | 1,115 | 1,059 | | | | | | | | | | | | | |
| 34 | 1,228 | 1,163 | 1,105 | | | | | | | | | | | | | |
| 35 | 1,304 | 1,236 | 1,174 | 1,053 | 1,005 | 962 | 922 | 885 | 851 | 819 | 790 | | | | | |
| | | | | 1,118 | 1,067 | 1,021 | 978 | 939 | 903 | 870 | 838 | | | | | |
| 36 | 1,380 | 1,307 | 1,242 | 1,183 | 1,129 | 1,080 | 1,035 | 994 | 955 | 920 | 887 | | | | | |
| 37 | 1,456 | 1,379 | 1,310 | 1,248 | 1,191 | 1,139 | 1,092 | 1,048 | 1,008 | 970 | 936 | | | | | |
| 38 | 1,560 | 1,478 | 1,404 | 1,337 | 1,276 | 1,221 | 1,170 | 1,123 | 1,080 | 1,040 | 1,003 | | | | | |
| 39 | 1,663 | 1,576 | 1,497 | 1,426 | 1,361 | 1,302 | 1,247 | 1,198 | 1,151 | 1,109 | 1,069 | | | | | |
| 40 | 1,767 | 1,674 | 1,590 | 1,514 | 1,445 | 1,383 | 1,325 | 1,272 | 1,223 | 1,178 | 1,136 | | | | | |
| 41 | 1,938 | 1,836 | 1,744 | 1,661 | 1,585 | 1,516 | 1,453 | 1,395 | 1,341 | 1,292 | 1,246 | | | | | |
| 42 | 2,108 | 1,997 | 1,897 | 1,807 | 1,724 | 1,649 | 1,581 | 1,518 | 1,459 | 1,405 | 1,355 | | | | | |
| 43 | 2,278 | 2,158 | 2,050 | 1,952 | 1,863 | 1,782 | 1,708 | 1,640 | 1,577 | 1,518 | 1,464 | | | | | |
| 44 | 2,423 | 2,296 | 2,181 | 2,077 | 1,983 | 1,896 | 1,817 | 1,745 | 1,678 | 1,615 | 1,558 | | | | | |
| 45 | 2,579 | 2,443 | 2,321 | 2,210 | 2,110 | 2,018 | 1,934 | 1,857 | 1,785 | 1,719 | 1,658 | | | | | |
| 46 | 2,711 | 2,568 | 2,440 | 2,324 | 2,218 | 2,122 | 2,033 | 1,952 | 1,877 | 1,807 | 1,743 | | | | | |
| 47 | 2,882 | 2,730 | 2,594 | 2,470 | 2,358 | 2,255 | 2,162 | 2,075 | 1,995 | 1,921 | 1,853 | | | | | |
| 48 | 3,052 | 2,891 | 2,747 | 2,616 | 2,497 | 2,389 | 2,289 | 2,198 | 2,113 | 2,035 | 1,962 | | | | | |
| 49 | 3,222 | 3,053 | 2,900 | 2,762 | 2,636 | 2,522 | 2,417 | 2,320 | 2,231 | 2,148 | 2,071 | | | | | |
| 50 | 3,456 | 3,274 | 3,110 | 2,962 | 2,827 | 2,704 | 2,592 | 2,488 | 2,392 | 2,304 | 2,221 | 2,001 | 1,934 | 1,871 | 1,813 | |
| | | | | | | | | | | | | 2,145 | 2,073 | 2,006 | 1,944 | |
| 51 | 3,689 | 3,495 | 3,320 | 3,162 | 3,018 | 2,887 | 2,767 | 2,656 | 2,554 | 2,459 | 2,371 | 2,289 | 2,213 | 2,142 | 2,075 | |
| 52 | 3,949 | 3,741 | 3,554 | 3,384 | 3,231 | 3,090 | 2,962 | 2,843 | 2,734 | 2,632 | 2,538 | 2,451 | 2,369 | 2,293 | 2,221 | |
| 53 | 4,208 | 3,986 | 3,787 | 3,606 | 3,442 | 3,293 | 3,156 | 3,030 | 2,913 | 2,805 | 2,705 | 2,612 | 2,524 | 2,443 | 2,367 | |
| 54 | 4,467 | 4,231 | 4,020 | 3,828 | 3,654 | 3,495 | 3,350 | 3,216 | 3,092 | 2,978 | 2,871 | 2,772 | 2,680 | 2,593 | 2,513 | |
| 55 | 4,904 | 4,646 | 4,414 | 4,203 | 4,012 | 3,838 | 3,678 | 3,531 | 3,395 | 3,269 | 3,152 | 3,044 | 2,942 | 2,847 | 2,759 | |
| 56 | 5,341 | 5,060 | 4,807 | 4,518 | 4,370 | 4,180 | 4,006 | 3,846 | 3,698 | 3,561 | 3,433 | 3,315 | 3,204 | 3,101 | 3,004 | |
| 57 | 5,778 | 5,474 | 5,200 | 4,952 | 4,727 | 4,521 | 4,333 | 4,160 | 4,000 | 3,852 | 3,714 | 3,586 | 3,466 | 3,355 | 3,250 | |
| 58 | 6,141 | 5,818 | 5,527 | 5,263 | 5,024 | 4,806 | 4,606 | 4,422 | 4,251 | 4,094 | 3,947 | 3,811 | 3,684 | 3,565 | 3,454 | |
| 59 | 6,503 | 6,161 | 5,853 | 5,574 | 5,320 | 5,089 | 4,877 | 4,682 | 4,502 | 4,335 | 4,180 | 4,036 | 3,902 | 3,776 | 3,658 | |
| 60 | 6,867 | 6,505 | 6,180 | 5,885 | 5,618 | 5,374 | 5,150 | 4,944 | 4,754 | 4,578 | 4,414 | 4,262 | 4,120 | 3,987 | 3,863 | |
| 61 | 7,297 | 6,912 | 6,567 | 6,254 | 5,969 | 5,710 | 5,472 | 5,254 | 5,051 | 4,864 | 4,690 | 4,529 | 4,378 | 4,236 | 4,104 | |
| 62 | 7,725 | 7,319 | 6,953 | 6,621 | 6,320 | 6,046 | 5,794 | 5,562 | 5,348 | 5,150 | 4,965 | 4,795 | 4,635 | 4,485 | 4,346 | |
| 63 | 8,154 | 7,725 | 7,339 | 6,989 | 6,671 | 6,381 | 6,116 | 5,871 | 5,645 | 5,436 | 5,242 | 5,061 | 4,892 | 4,734 | 4,587 | |
| "B" (avg. in.) | 8¼ | 8¾ | 9¼ | 9⅝ | 10⅞ | 10⅝ | 11 | 11½ | 12 | 12¾ | 12⅞ | 13¾ | 13⅞ | 14¼ | 14¾ | |

Table Continued on Facing Page

Shading in gray indicates this item is available upon request.



CONSTANT SUPPORTS

| Hanger Size No. | TOTAL TRAVEL* (IN); LOAD (LBS) SEE NOTES ON PAGE 199 | | | | | | | | | | | | | | | | |
|-------------------------|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | 4 | 4½ | 5 | 5½ | 6 | 6½ | 7 | 7½ | 8 | 8½ | 9 | 9½ | 10 | 10½ | 11 | 11½ | 12 |
| 64 | 19,225 | 17,089 | 15,380 | 13,982 | 12,816 | 11,831 | 10,986 | 10,253 | 9,613 | 9,047 | 8,544 | 8,094 | 7,690 | 7,323 | 6,990 | 6,686 | 6,408 |
| 65 | 20,100 | 17,866 | 16,080 | 14,618 | 13,400 | 12,370 | 11,486 | 10,720 | 10,050 | 9,459 | 8,933 | 8,463 | 8,040 | 7,657 | 7,308 | 6,991 | 6,700 |
| 66 | 22,068 | 19,615 | 17,654 | 16,049 | 14,711 | 13,580 | 12,610 | 11,769 | 11,034 | 10,385 | 9,808 | 9,291 | 8,827 | 8,406 | 8,024 | 7,675 | 7,356 |
| 67 | 24,033 | 21,362 | 19,226 | 17,478 | 16,021 | 14,790 | 13,733 | 12,817 | 12,016 | 11,310 | 10,681 | 10,119 | 9,613 | 9,154 | 8,738 | 8,359 | 8,011 |
| 68 | 26,000 | 23,111 | 20,800 | 18,909 | 17,333 | 16,000 | 14,857 | 13,866 | 13,000 | 12,236 | 11,555 | 10,947 | 10,400 | 9,904 | 9,454 | 9,043 | 8,666 |
| 69 | 27,635 | 24,564 | 22,108 | 20,098 | 18,423 | 17,007 | 15,792 | 14,738 | 13,818 | 13,005 | 12,282 | 11,635 | 11,054 | 10,527 | 10,048 | 9,611 | 9,211 |
| 70 | 29,268 | 26,015 | 23,414 | 21,286 | 19,511 | 18,011 | 16,725 | 15,609 | 14,632 | 13,773 | 13,008 | 12,323 | 11,707 | 11,149 | 10,642 | 10,179 | 9,755 |
| 71 | 30,900 | 27,466 | 24,720 | 22,473 | 20,599 | 19,016 | 17,657 | 16,480 | 15,450 | 14,542 | 13,733 | 13,010 | 12,360 | 11,770 | 11,235 | 10,747 | 10,300 |
| 72 | 32,835 | 29,186 | 26,268 | 23,880 | 21,889 | 20,207 | 18,763 | 17,512 | 16,418 | 15,452 | 14,593 | 13,825 | 13,134 | 12,508 | 11,939 | 11,420 | 10,945 |
| 73 | 34,768 | 30,904 | 27,814 | 25,286 | 23,177 | 21,396 | 19,868 | 18,542 | 17,384 | 16,362 | 15,452 | 14,639 | 13,907 | 13,244 | 12,641 | 12,092 | 11,589 |
| 74 | 36,700 | 32,622 | 29,360 | 26,691 | 24,466 | 22,585 | 20,972 | 19,573 | 18,350 | 17,271 | 16,311 | 15,452 | 14,680 | 13,980 | 13,344 | 12,764 | 12,233 |
| 75 | 38,800 | 34,489 | 31,040 | 28,218 | 25,866 | 23,878 | 22,172 | 20,693 | 19,400 | 18,259 | 17,244 | 16,336 | 15,520 | 14,780 | 14,108 | 13,495 | 12,933 |
| 76 | 40,900 | 36,355 | 32,720 | 29,746 | 27,266 | 25,170 | 23,372 | 21,813 | 20,450 | 19,248 | 18,178 | 17,221 | 16,360 | 15,580 | 14,871 | 14,225 | 13,633 |
| 77 | 43,000 | 38,222 | 34,400 | 31,273 | 28,666 | 26,462 | 24,572 | 22,933 | 21,500 | 20,236 | 19,111 | 18,105 | 17,200 | 16,380 | 15,635 | 14,955 | 14,333 |
| 78 | 45,335 | 40,297 | 36,268 | 32,971 | 30,222 | 27,899 | 25,906 | 24,178 | 22,668 | 21,335 | 20,149 | 19,088 | 18,134 | 17,269 | 16,484 | 15,768 | 15,111 |
| 79 | 47,668 | 42,371 | 38,134 | 34,668 | 31,779 | 29,335 | 27,239 | 25,422 | 23,834 | 22,432 | 21,185 | 20,070 | 19,067 | 18,158 | 17,332 | 16,579 | 15,889 |
| 80 | 50,000 | 44,444 | 40,000 | 36,364 | 33,332 | 30,770 | 28,572 | 26,666 | 25,000 | 23,530 | 22,222 | 21,052 | 20,000 | 19,046 | 18,180 | 17,390 | 16,666 |
| 81 | 52,500 | 46,666 | 42,000 | 38,182 | 35,000 | 32,309 | 30,000 | 27,999 | 26,250 | 24,707 | 23,333 | 22,105 | 21,000 | 19,998 | 19,089 | 18,260 | 17,500 |
| 82 | 55,000 | 48,888 | 44,000 | 40,000 | 36,665 | 33,847 | 31,429 | 29,333 | 27,500 | 25,883 | 24,444 | 23,157 | 22,000 | 20,951 | 20,000 | 19,129 | 18,333 |
| 83 | 57,500 | 51,111 | 46,000 | 41,819 | 38,332 | 35,386 | 32,858 | 30,666 | 28,750 | 27,060 | 25,555 | 24,210 | 23,000 | 21,903 | 20,907 | 20,000 | 19,166 |
| 84 | | | 49,200 | 44,728 | 40,998 | 37,847 | 35,144 | 32,799 | 30,750 | 28,942 | 27,333 | 25,894 | 24,600 | 23,427 | 22,361 | 21,390 | 20,500 |
| 85 | | | 52,400 | 47,637 | 43,665 | 40,309 | 37,429 | 34,932 | 32,750 | 30,824 | 29,111 | 27,578 | 26,200 | 24,950 | 23,816 | 22,781 | 21,832 |
| 86 | | | 55,400 | 50,364 | 46,165 | 42,616 | 39,572 | 36,932 | 34,625 | 32,589 | 30,777 | 29,157 | 27,700 | 26,379 | 25,179 | 24,085 | 23,082 |
| 87 | | | 58,400 | 53,091 | 48,665 | 44,924 | 41,715 | 38,932 | 36,500 | 34,354 | 32,444 | 30,736 | 29,200 | 27,807 | 26,543 | 25,389 | 24,332 |
| 88 | | | 61,400 | 55,819 | 51,165 | 47,232 | 43,858 | 40,932 | 38,375 | 36,119 | 34,111 | 32,315 | 30,700 | 29,236 | 27,906 | 26,694 | 25,582 |
| 89 | | | 66,000 | 60,000 | 54,998 | 50,771 | 47,144 | 43,999 | 41,250 | 38,825 | 36,666 | 34,736 | 33,000 | 31,426 | 29,997 | 28,694 | 27,500 |
| 90 | | | | | 61,331 | 56,617 | 52,572 | 49,065 | 46,000 | 43,295 | 40,888 | 38,736 | 36,800 | 35,045 | 33,451 | 31,998 | 30,665 |
| 91 | | | | | 67,164 | 62,002 | 57,573 | 53,732 | 50,375 | 47,413 | 44,777 | 42,420 | 40,300 | 38,378 | 36,633 | 35,041 | 33,582 |
| 92 | | | | | 73,500 | 67,848 | 63,001 | 58,799 | 55,125 | 51,884 | 49,000 | 46,420 | 44,100 | 41,996 | 40,087 | 38,345 | 36,749 |
| 93 | | | | | 80,830 | 74,617 | 69,287 | 64,665 | 60,625 | 57,060 | 53,888 | 51,051 | 48,500 | 46,187 | 44,087 | 42,171 | 40,415 |
| 94 | | | | | 87,500 | 81,540 | 75,716 | 70,665 | 66,250 | 62,355 | 58,888 | 55,788 | 53,000 | 50,472 | 48,177 | 46,084 | 44,165 |
| 95 | | | | | | | 78,930 | 73,665 | 69,063 | 65,002 | 61,388 | 58,156 | 55,250 | 52,615 | 50,222 | 48,040 | 46,040 |
| 96 | | | | | | | 82,145 | 76,665 | 71,875 | 67,649 | 63,888 | 60,525 | 57,500 | 54,757 | 52,268 | 50,000 | 47,915 |
| 97 | | | | | | | 85,360 | 79,665 | 74,688 | 70,296 | 66,388 | 62,893 | 59,750 | 56,900 | 54,313 | 51,953 | 49,790 |
| 98 | | | | | | | 87,500 | 82,665 | 77,500 | 72,943 | 68,888 | 65,261 | 62,000 | 59,043 | 56,358 | 53,909 | 51,665 |
| 99 | | | | | | | | 85,998 | 80,625 | 75,884 | 71,666 | 67,893 | 64,500 | 61,423 | 58,631 | 56,083 | 53,748 |
| 100 | | | | | | | | 87,500 | 83,750 | 78,826 | 74,444 | 70,524 | 67,000 | 63,804 | 60,903 | 58,257 | 55,831 |
| 101 | | | | | | | | | 86,875 | 81,767 | 77,221 | 73,156 | 69,500 | 66,185 | 63,176 | 60,430 | 57,914 |
| 102 | | | | | | | | | 87,500 | 84,708 | 80,000 | 75,787 | 72,000 | 68,566 | 65,448 | 62,604 | 60,000 |
| 103 | | | | | | | | | | 87,500 | 83,610 | 79,210 | 75,250 | 71,661 | 68,402 | 65,430 | 62,706 |
| 104 | | | | | | | | | | | 87,221 | 82,629 | 78,500 | 74,756 | 71,357 | 68,256 | 65,414 |
| 105 | | | | | | | | | | | 87,500 | 86,050 | 81,750 | 77,851 | 74,311 | 71,082 | 68,122 |
| 106 | | | | | | | | | | | | 87,500 | 85,000 | 80,946 | 77,265 | 73,908 | 70,831 |
| 107 | | | | | | | | | | | | | 87,500 | 84,469 | 80,628 | 77,125 | 73,914 |
| 108 | | | | | | | | | | | | | | 87,500 | 83,992 | 80,342 | 77,000 |
| 109 | | | | | | | | | | | | | | | 87,446 | 83,646 | 80,163 |
| 110 | | | | | | | | | | | | | | | 87,500 | 86,950 | 83,330 |
| "B" dim Sizes 64 to 83 | 3¾ | 4⅛ | 4⅝ | 5 | 5½ | 6 | 6½ | 6⅞ | 7⅓ | 7⅞ | 8¼ | 8¾ | 9¼ | 9⅝ | 10⅞ | 10⅞ | 11 |
| "B" dim Sizes 84 to 110 | | | 4⅜ | 4⅞ | 5 | 5⅝ | 5⅞ | 6¼ | 6⅝ | 7⅞ | 7½ | 7⅞ | 8⅞ | 8¾ | 9⅝ | 9⅞ | 10 |

Table Continued on Facing Page

Shading in gray indicates this item is available upon request.



CONSTANT SUPPORTS

| Hanger Size No. | TOTAL TRAVEL* (IN); LOAD (LBS) | | | | | | | | | | | | | | | |
|-------------------------|--------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | 12½ | 13 | 13½ | 14 | 14½ | 15 | 15½ | 16 | 16½ | 17 | 17½ | 18 | 18½ | 19 | 19½ | 20 |
| 64 | 6,152 | 5,915 | 5,696 | 5,492 | 5,303 | 5,126 | 4,961 | 4,806 | | | | | | | | |
| 65 | 6,432 | 6,184 | 5,955 | 5,742 | 5,544 | 5,359 | 5,187 | 5,025 | | | | | | | | |
| 66 | 7,062 | 6,790 | 6,538 | 6,304 | 6,087 | 5,884 | 5,694 | 5,517 | | | | | | | | |
| 67 | 7,690 | 7,394 | 7,120 | 6,966 | 6,629 | 6,408 | 6,201 | 6,008 | | | | | | | | |
| 68 | 8,320 | 8,000 | 7,703 | 7,428 | 7,172 | 6,933 | 6,709 | 6,500 | | | | | | | | |
| 69 | 8,843 | 8,503 | 8,188 | 7,895 | 7,623 | 7,369 | 7,131 | 6,909 | | | | | | | | |
| 70 | 9,366 | 9,005 | 8,671 | 8,361 | 8,073 | 7,804 | 7,552 | 7,317 | | | | | | | | |
| 71 | 9,888 | 9,507 | 9,155 | 8,828 | 8,523 | 8,239 | 7,973 | 7,725 | | | | | | | | |
| 72 | 10,507 | 10,103 | 9,728 | 9,380 | 9,057 | 8,755 | 8,473 | 8,209 | | | | | | | | |
| 73 | 11,126 | 10,697 | 10,301 | 9,932 | 9,590 | 9,270 | 8,971 | 8,692 | | | | | | | | |
| 74 | 11,744 | 11,292 | 10,873 | 10,484 | 10,123 | 9,786 | 9,470 | 9,175 | | | | | | | | |
| 75 | 12,416 | 11,938 | 11,496 | 11,084 | 10,703 | 10,346 | 10,012 | 9,700 | | | | | | | | |
| 76 | 13,088 | 12,584 | 12,118 | 11,684 | 11,282 | 10,906 | 10,554 | 10,225 | | | | | | | | |
| 77 | 13,760 | 13,230 | 12,740 | 12,284 | 11,861 | 11,466 | 11,096 | 10,750 | | | | | | | | |
| 78 | 14,507 | 13,949 | 13,432 | 12,951 | 12,505 | 12,088 | 11,698 | 11,334 | | | | | | | | |
| 79 | 15,254 | 14,666 | 14,123 | 13,618 | 13,149 | 12,710 | 12,300 | 11,917 | | | | | | | | |
| 80 | 16,000 | 15,384 | 14,814 | 14,284 | 13,792 | 13,332 | 12,902 | 12,500 | | | | | | | | |
| 81 | 16,800 | 16,153 | 15,555 | 14,998 | 14,482 | 14,000 | 13,547 | 13,125 | | | | | | | | |
| 82 | 17,600 | 16,922 | 16,295 | 15,712 | 15,171 | 14,665 | 14,192 | 13,750 | | | | | | | | |
| 83 | 18,400 | 17,692 | 17,036 | 16,427 | 15,861 | 15,332 | 14,837 | 14,375 | | | | | | | | |
| 84 | 19,680 | 18,922 | 18,221 | 17,569 | 16,964 | 16,398 | 15,869 | 15,375 | | | | | | | | |
| 85 | 20,960 | 20,153 | 19,406 | 18,712 | 18,068 | 17,465 | 16,902 | 16,375 | | | | | | | | |
| 86 | 22,160 | 21,307 | 20,517 | 19,783 | 19,102 | 18,465 | 17,869 | 17,313 | | | | | | | | |
| 87 | 23,360 | 22,461 | 21,628 | 20,855 | 20,136 | 19,465 | 18,837 | 18,250 | | | | | | | | |
| 88 | 24,560 | 23,614 | 22,739 | 21,926 | 21,171 | 20,465 | 19,805 | 19,188 | | | | | | | | |
| 89 | 26,400 | 25,384 | 24,443 | 23,569 | 22,757 | 21,998 | 21,288 | 20,626 | | | | | | | | |
| 90 | 29,440 | 28,307 | 27,258 | 26,283 | 25,377 | 24,531 | 23,740 | 23,000 | | | | | | | | |
| 91 | 32,240 | 31,000 | 29,850 | 28,782 | 27,791 | 26,864 | 25,998 | 25,188 | | | | | | | | |
| 92 | 35,280 | 33,922 | 32,665 | 31,496 | 30,411 | 29,397 | 28,449 | 27,563 | | | | | | | | |
| 93 | 38,800 | 37,306 | 35,924 | 34,639 | 33,446 | 32,330 | 31,287 | 30,313 | | | | | | | | |
| 94 | 42,400 | 40,768 | 39,257 | 37,583 | 36,549 | 35,330 | 34,190 | 33,125 | | | | | | | | |
| 95 | 44,200 | 42,498 | 40,924 | 39,460 | 38,100 | 36,830 | 35,642 | 34,531 | 32,119 | 31,175 | 30,285 | 29,442 | 28,647 | 27,894 | 27,179 | 26,500 |
| 96 | 46,000 | 44,230 | 42,590 | 41,067 | 39,652 | 38,330 | 37,093 | 35,938 | 34,845 | 33,822 | 32,856 | 31,941 | 31,080 | 30,262 | 29,486 | 28,750 |
| 97 | 47,800 | 45,960 | 44,257 | 42,673 | 41,204 | 39,829 | 39,545 | 37,344 | 36,209 | 35,145 | 34,141 | 33,191 | 32,295 | 31,446 | 30,640 | 29,875 |
| 98 | 49,600 | 47,690 | 45,923 | 44,280 | 42,755 | 41,329 | 40,000 | 38,750 | 37,572 | 36,468 | 35,427 | 34,441 | 33,511 | 32,631 | 31,794 | 31,000 |
| 99 | 51,600 | 49,613 | 47,775 | 46,066 | 44,479 | 42,996 | 41,609 | 40,313 | 39,087 | 37,939 | 36,855 | 35,830 | 34,862 | 33,946 | 33,076 | 32,250 |
| 100 | 53,600 | 51,536 | 49,627 | 47,851 | 46,203 | 44,662 | 43,221 | 41,875 | 40,602 | 39,409 | 38,284 | 37,219 | 36,214 | 35,262 | 34,358 | 33,500 |
| 101 | 55,600 | 53,459 | 51,479 | 49,637 | 47,927 | 46,329 | 44,834 | 43,438 | 42,117 | 40,880 | 39,712 | 38,607 | 37,565 | 36,578 | 35,640 | 34,750 |
| 102 | 57,600 | 56,382 | 53,330 | 51,422 | 49,651 | 47,995 | 46,447 | 45,000 | 43,632 | 42,350 | 41,141 | 39,996 | 38,916 | 37,894 | 36,922 | 36,000 |
| 103 | 60,200 | 57,882 | 55,738 | 53,744 | 51,892 | 50,162 | 48,544 | 47,031 | 45,602 | 44,262 | 42,998 | 41,801 | 40,673 | 39,604 | 38,588 | 37,625 |
| 104 | 62,800 | 60,382 | 58,145 | 56,065 | 54,134 | 52,328 | 50,640 | 49,063 | 47,571 | 46,174 | 44,855 | 43,607 | 42,429 | 41,315 | 40,255 | 39,250 |
| 105 | 65,400 | 62,882 | 60,552 | 58,386 | 56,375 | 54,495 | 52,737 | 51,094 | 49,541 | 48,085 | 46,712 | 45,412 | 44,186 | 43,025 | 41,921 | 40,875 |
| 106 | 68,000 | 65,382 | 62,960 | 60,707 | 58,616 | 56,661 | 54,834 | 53,125 | 51,510 | 50,000 | 48,569 | 47,218 | 45,943 | 44,736 | 43,588 | 42,500 |
| 107 | 70,960 | 68,228 | 65,700 | 63,350 | 61,168 | 59,127 | 57,220 | 55,438 | 53,752 | 52,173 | 50,683 | 49,273 | 47,942 | 46,683 | 45,485 | 44,350 |
| 108 | 73,920 | 71,074 | 68,441 | 65,992 | 63,719 | 61,594 | 59,607 | 57,750 | 55,994 | 54,350 | 52,797 | 51,328 | 49,942 | 48,630 | 47,383 | 46,200 |
| 109 | 76,960 | 74,000 | 71,255 | 68,706 | 66,340 | 64,127 | 62,059 | 60,125 | 58,297 | 56,585 | 54,969 | 53,439 | 52,000 | 50,630 | 49,331 | 48,100 |
| 110 | 80,000 | 76,920 | 74,070 | 71,420 | 68,960 | 66,660 | 64,510 | 62,500 | 60,600 | 58,820 | 57,140 | 55,550 | 54,050 | 52,630 | 51,280 | 50,000 |
| "B" dim Sizes 64 to 83 | 11½ | 12 | 12¾ | 12⅞ | 13¾ | 13⅞ | 14¼ | 14¾ | - | - | - | - | - | - | - | - |
| "B" dim Sizes 84 to 110 | 10¾ | 10⅞ | 11⅞ | 11⅞ | 12⅞ | 12½ | 12⅞ | 13⅞ | 13⅞ | 14⅞ | 14⅞ | 14⅞ | 15⅞ | 15¾ | 16⅞ | 16⅞ |

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Shading in gray indicates this item is available upon request.

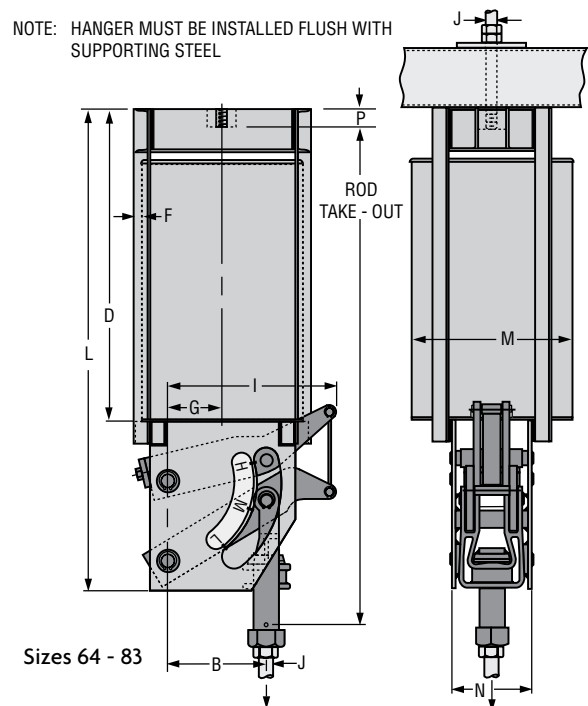
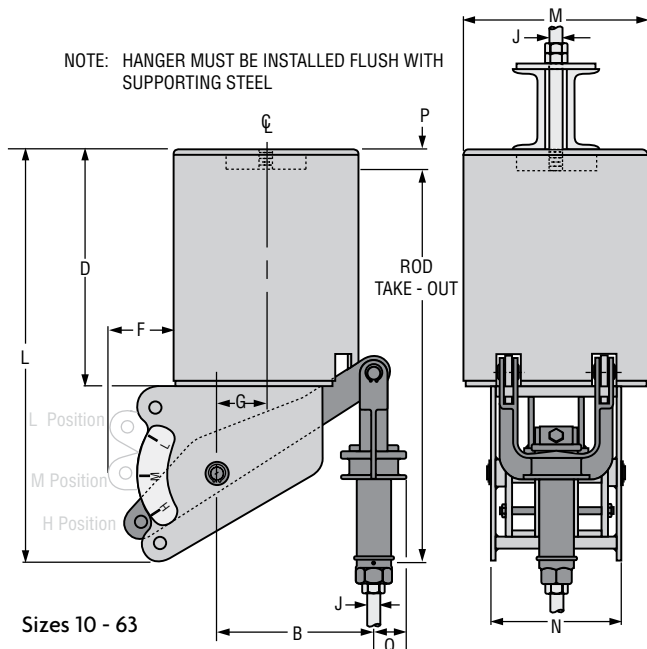
- (1) * Note: Total travel equals actual travel plus 1" or 20% (whichever is greater), rounded up to nearest ½" as applicable.
- (2) Constant supports are readily available for travel and load not listed in this table. Dimensions and lug locations may vary from those shown on the following pages.
- (3) For Type F Upthrust see page 213 for standard travel and sizes.
- (4) Fig. 80-V are not available for sizes 1 thru 9.



CONSTANT SUPPORTS

Fig. 80-V Type A

Model R



Type A of the figure 80-V vertical design model R Constant Support Hanger is designed for attachment to its supporting member by screwing a rod into a tapped hole in the top cap of hanger a distance equal to the "P" dimension plus $\frac{3}{8}$ ". Sight holes are provided near the top of the casing to allow visible inspection for correct thread engagement of upper hanger rod.

Notes: See load travel tables, page 196 through 199 for "B" dimension. For weights see page 215. Location of travel indicator and contour of side plate may vary from that shown.

FIG. 80-V, TYPE A: DIMENSIONS (IN)

| Hanger Sizes | L | D | F | G | I | Dia. M | N | P | Q | Total Travel TT | Factors | J-rod | | |
|--------------|-----------------------------|------------------|------------------|-----------------|------------------|-------------------|-------------------|-----------------|-----------------|--|---|----------------------|-----------------|-----------------|
| | | | | | | | | | | | | Min Thd Length | Rod Dia. | |
| | | | | | | | | | | | | | Min | Max |
| 1 - 9 | Available in Fig. 81-H only | | | | | | | | | | | | | |
| 10 - 18 | 18 $\frac{7}{8}$ | 8 $\frac{7}{8}$ | 2 | 1 $\frac{1}{2}$ | • | 8 $\frac{5}{8}$ | 6 $\frac{7}{16}$ | $\frac{7}{8}$ | 1 $\frac{3}{8}$ | 5 or less 5 $\frac{1}{2}$ or more | 16 $\frac{15}{16}$ 19 $\frac{1}{4}$ | 1 $\frac{3}{4}$ + TT | $\frac{1}{2}$ | $\frac{3}{4}$ |
| 19 - 34 | 28 $\frac{1}{2}$ | 16 | 2 $\frac{1}{8}$ | 2 $\frac{5}{8}$ | • | 12 $\frac{3}{4}$ | 8 $\frac{9}{16}$ | 1 $\frac{1}{8}$ | 1 $\frac{5}{8}$ | 5 or less 5 $\frac{1}{2}$ or more | 27 $\frac{15}{16}$ 30 $\frac{1}{16}$ | 2 $\frac{3}{8}$ + TT | $\frac{1}{2}$ | 1 $\frac{1}{4}$ |
| 35 - 49 | 32 $\frac{3}{4}$ | 18 $\frac{1}{4}$ | 4 $\frac{3}{4}$ | 3 $\frac{3}{4}$ | • | 14 | 9 $\frac{13}{16}$ | 1 $\frac{1}{2}$ | 2 $\frac{1}{2}$ | 6 or less 6 $\frac{1}{2}$ or more | 32 $\frac{3}{8}$ 37 | 3 $\frac{1}{4}$ + TT | $\frac{1}{2}$ | 1 $\frac{3}{4}$ |
| 50 - 63 | 46 $\frac{7}{8}$ | 28 $\frac{3}{8}$ | 8 $\frac{5}{16}$ | 5 $\frac{7}{8}$ | • | 18 | 11 $\frac{1}{4}$ | 2 | 3 | 11 or less 11 $\frac{1}{2}$ or more | 46 $\frac{1}{2}$ 51 $\frac{3}{4}$ | 4 $\frac{1}{4}$ + TT | $\frac{3}{4}$ | 2 $\frac{1}{4}$ |
| 64 - 74 | 67 $\frac{1}{2}$ | 44 $\frac{1}{4}$ | 1 $\frac{3}{16}$ | 7 $\frac{1}{2}$ | 25 $\frac{3}{8}$ | 22 $\frac{3}{16}$ | 11 | 2 $\frac{1}{2}$ | - | 10 $\frac{1}{2}$ or less 11 or more | 77 $\frac{3}{8}$ 77 $\frac{3}{4}$ | 5 $\frac{3}{4}$ + TT | 1 $\frac{1}{4}$ | 2 $\frac{3}{4}$ |
| 75 - 83 | 69 $\frac{1}{2}$ | 46 $\frac{1}{4}$ | 1 $\frac{1}{2}$ | 7 $\frac{1}{2}$ | 25 $\frac{3}{8}$ | 27 $\frac{3}{16}$ | 11 | 3 | - | 10 $\frac{1}{2}$ or less 11 or more | 78 $\frac{3}{16}$ 78 $\frac{3}{16}$ | 5 $\frac{3}{4}$ + TT | 1 $\frac{1}{2}$ | 3 $\frac{1}{4}$ |
| 84-110 | See page 207 | | | | | | | | | | | | | |

Rod take-out = (factor) - (TT / 2), for lever in high position.

• "I" dimension for sizes 10 through 63 equals "B" + "Q" Note: See the size selection chart (page 196 through 199) for the "B" dimension.

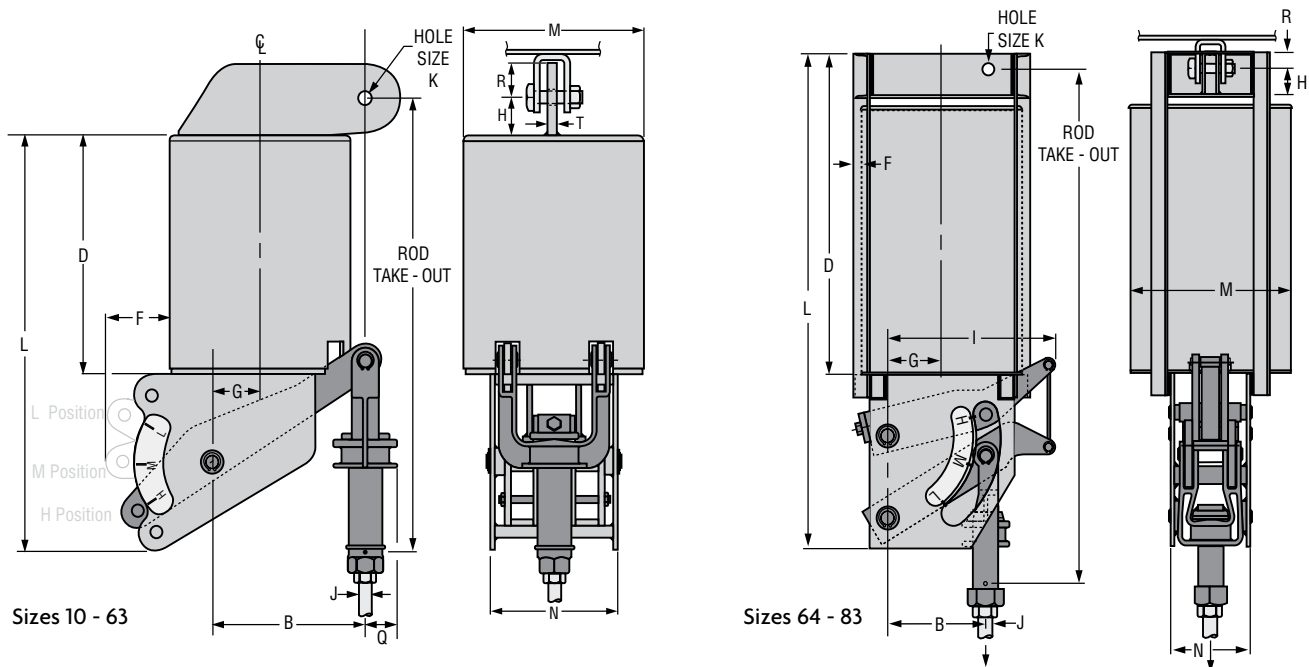
J-ROD SELECTION CHART

| Load (lbs) | 0 800 | 801 1,500 | 1,501 2,540 | 2,541 4,000 | 4,001 6,100 | 6,101 9,400 | 9,401 13,400 | 13,401 18,300 | 18,301 24,700 | 24,701 31,000 | 31,001 39,000 | 39,001 48,000 | 48,001 58,000 |
|------------|---------------|---------------|----------------|----------------|-----------------|-----------------|-----------------|------------------|------------------|------------------|------------------|------------------|-------------------|
| J Rod Size | $\frac{1}{2}$ | $\frac{5}{8}$ | $\frac{3}{4}$ | 1 | 1 $\frac{1}{4}$ | 1 $\frac{1}{2}$ | 1 $\frac{3}{4}$ | 2 | 2 $\frac{1}{4}$ | 2 $\frac{1}{2}$ | 2 $\frac{3}{4}$ | 3 | 3 $\frac{1}{4}$ * |

* 3 $\frac{1}{4}$ is furnished with 4 UNC series thread.

Fig. 80-V Type B

Model R



Type B is furnished with a single lug for attachment to the building structure. The lug permits use of a figure 66* welded beam attachment, a figure 299 clevis or a pair of angles for attachment where headroom is limited.

Notes: See load travel tables, page 196 through 199 for "B" dimension. For weights see page 215. Location of travel indicator and contour of side plate may vary from that shown.

FIG. 80-V, TYPE B: DIMENSIONS (IN)

| Hanger Size | L | D | F | G | H | I | Dia. M | N | Q | R | T | Total Travel TT | Factors | J-rod | | |
|-------------|--------------------------------|--------------------------------|--------------------------------|-------------------------------|-------------------------------|--------------------------------|---------------------------------|---------------------------------|-------------------------------|---|-------------------------------|--|---|------------------------------------|-------------------------------|-------------------------------|
| | | | | | | | | | | | | | | Min Thd Length | Rod Dia. Min Max | |
| 1-9 | Available in Fig. 81-H only | | | | | | | | | | | | | | | |
| 10-18 | 18 ⁷ / ₈ | 8 ⁷ / ₈ | 2 | 1 ¹ / ₂ | 1 ¹ / ₂ | • | 8 ⁵ / ₈ | 6 ⁷ / ₁₆ | 1 ³ / ₈ | 1 ¹ / ₂ | 3 ⁸ / ₈ | 5 or less 5 ¹ / ₂ or more | 19 ⁵ / ₁₆ 21 ⁵ / ₈ | 1 ³ / ₄ + TT | 1/2 | 3/4 |
| 19-34 | 28 ¹ / ₂ | 16 | 2 ¹ / ₈ | 2 ⁵ / ₈ | 2 | • | 12 ³ / ₄ | 8 ⁹ / ₁₆ | 1 ⁵ / ₈ | 1 ¹ / ₂ | 5 ⁸ / ₈ | 5 or less 5 ¹ / ₂ or more | 31 ¹ / ₁₆ 33 ³ / ₁₆ | 2 ⁵ / ₈ + TT | 1/2 | 1 ¹ / ₄ |
| 35-49 | 32 ³ / ₄ | 18 ¹ / ₄ | 4 ³ / ₄ | 3 ³ / ₄ | 3 | • | 14 | 9 ¹³ / ₁₆ | 2 ¹ / ₂ | 1 ¹ / ₄ K-hole & smaller, 1 ¹ / ₂ 1 ³ / ₈ K-hole and larger, 2 | 3 ⁴ / ₄ | 6 or less 6 ¹ / ₂ or more | 36 ⁷ / ₈ 41 ¹ / ₂ | 3 ³ / ₄ + TT | 1/2 | 1 ¹ / ₄ |
| 50-63 | 46 ⁷ / ₈ | 28 ³ / ₈ | 8 ⁵ / ₁₆ | 5 ⁵ / ₈ | 4 | • | 18 | 11 ¹ / ₄ | 3 | 1 ¹⁵ / ₁₆ K-hole, 1 ¹ / ₂ 1 ¹ / ₈ thru 1 ¹ / ₂ K-hole, 2 1 ³ / ₄ K-hole and larger, 3 | 1 | 11 or less 11 ¹ / ₂ or more | 52 ¹ / ₂ 57 ³ / ₄ | 4 ¹ / ₄ + TT | 3/4 | 2 ¹ / ₄ |
| 64-74 | 68 | 37 ¹ / ₄ | 1 ³ / ₁₆ | 7 ¹ / ₂ | 4 ¹ / ₂ | 25 ³ / ₈ | 22 ³ / ₁₆ | 11 | 3 ³ / ₄ | 1 ¹ / ₂ K-hole, 2 1 ³ / ₄ K-hole and larger, 3 | 2 | 10 ¹ / ₂ or less 11 or more | 77 ¹ / ₄ 77 ³ / ₈ | 5 ³ / ₄ + TT | 1 ¹ / ₄ | 2 ³ / ₄ |
| 75-83 | 69 ¹ / ₂ | 38 | 1 ¹ / ₂ | 7 ¹ / ₂ | 3 ⁵ / ₈ | 25 ³ / ₈ | 27 ³ / ₁₆ | 11 | | 3 ³ / ₄ | 2 ¹ / ₂ | 10 ¹ / ₂ or less 11 or more | 77 ¹⁵ / ₁₆ 78 ¹ / ₁₆ | 5 ³ / ₄ + TT | 1 ¹ / ₂ | 3 ³ / ₄ |
| 84-110 | See page 207 | | | | | | | | | | | | | | | |

Rod take-out = (factor) - (TT / 2), for lever in high position. • "I" dimension for sizes 10 through 63 equals "B" + "Q"

* For constant support sizes 50-63 and 64-74 where 1¹/₄" rod is required, check the "R" dimensions versus the Fig. 66 welded beam attachment dimensions for compatibility.

Note: See the size selection chart (page 196 through 199) for the "B" dimension. K hole center line location is determined by the formula of "B - G = K Center Line".

J-ROD SELECTION CHART

| Load (lbs) | 0 800 | 801 1,500 | 1,501 2,540 | 2,541 4,000 | 4,001 6,100 | 6,101 9,400 | 9,401 13,400 | 13,401 18,300 | 18,301 24,700 | 24,701 31,000 | 31,001 39,000 | 39,001 48,000 | 48,001 58,000 |
|------------|----------|--------------|----------------|----------------|----------------|----------------|-----------------|------------------|------------------|------------------|------------------|------------------|------------------|
| J-Rod Size | 1/2 | 5/8 | 3/4 | 1 | 1 1/4 | 1 1/2 | 1 3/4 | 2 | 2 1/4 | 2 1/2 | 2 3/4 | 3 | 3 1/4* |
| K-Hole | 1 1/16 | 1 3/16 | 1 5/16 | 1 1/4 | 1 1/2 | 1 3/4 | 2 | 2 3/8 | 2 5/8 | 2 7/8 | 3 1/8 | 3 3/8 | 3 5/8 |

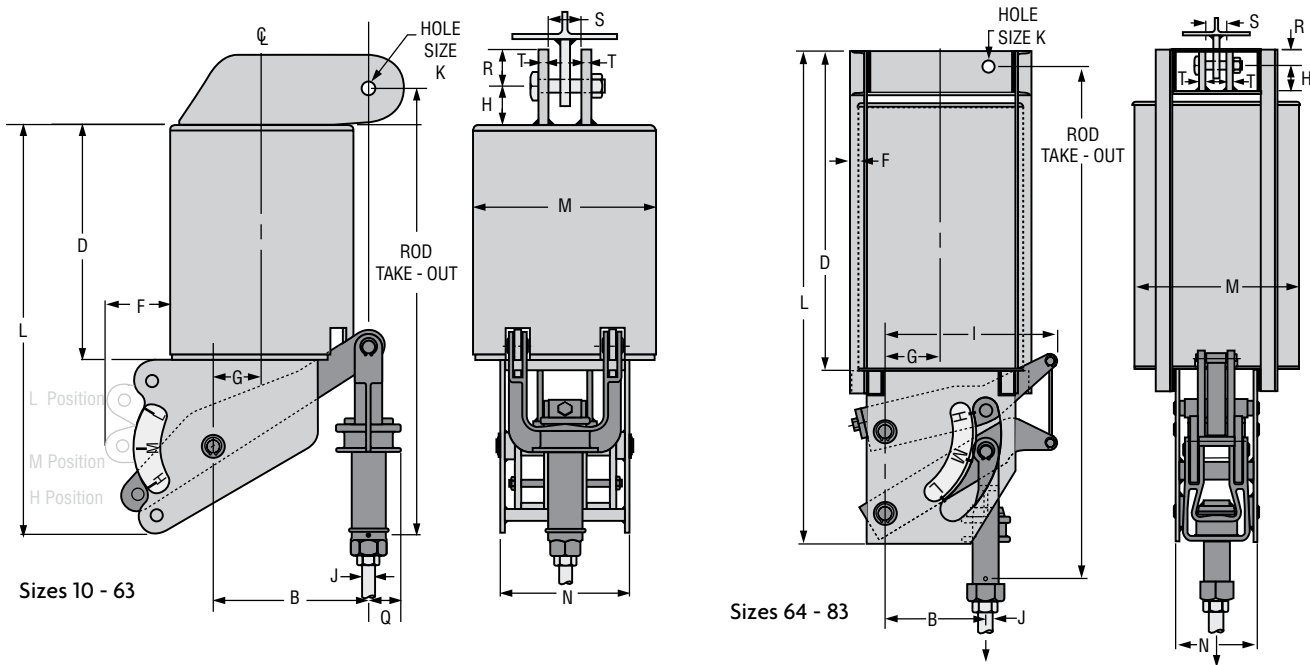
* 3¹/₄" is furnished with 4 UNC series thread.



CONSTANT SUPPORTS

Fig. 80-V Type C

Model R



Type C is furnished with a pair of lugs for attachment to the building structure. These lugs permit the use of an eye rod or a single plate for attachment where headroom is limited.

Notes: See load travel tables, page 196 through 199 for "B" dimension. For weights see page 215. Location of travel indicator and contour of side plate may vary from that shown.

FIG. 80-V, TYPE C: DIMENSIONS (IN)

| Hanger Size | L | D | F | G | H | I | Dia. M | N | Q | R | T | Total Travel TT | Factors | J-rod | | |
|-------------|--------------------------------|--------------------------------|--------------------------------|-------------------------------|-------------------------------|--------------------------------|---------------------------------|---------------------------------|-------------------------------|---|-------------------------------|--|---|------------------------------------|-------------------------------|---------------------------------|
| | | | | | | | | | | | | | | Min | Thd Length | Rod Dia. Max |
| 1-9 | Available in Fig. 81-H only | | | | | | | | | | | | | | | |
| 10-18 | 18 ⁷ / ₈ | 8 ⁷ / ₈ | 2 | 1 ¹ / ₂ | 1 ¹ / ₂ | • | 8 ⁵ / ₈ | 6 ⁷ / ₁₆ | 1 ³ / ₈ | 1 ¹ / ₂ | 3 ³ / ₈ | 5 or less 5 ¹ / ₂ or more | 19 ⁵ / ₁₆ 21 ⁵ / ₈ | 1 ³ / ₄ + TT | 1 ¹ / ₂ | 3 ³ / ₄ |
| 19-34 | 28 ¹ / ₂ | 16 | 2 ¹ / ₈ | 2 ⁵ / ₈ | 2 | • | 12 ³ / ₄ | 8 ⁹ / ₁₆ | 1 ⁵ / ₈ | 1 ¹ / ₂ | 5 ¹ / ₈ | 5 or less 5 ¹ / ₂ or more | 31 ¹ / ₁₆ 33 ³ / ₁₆ | 2 ³ / ₈ + TT | 1 ¹ / ₂ | 1 ¹ / ₄ |
| 35-49 | 32 ³ / ₄ | 18 ¹ / ₄ | 4 ³ / ₄ | 3 ³ / ₄ | 3 | • | 14 | 9 ¹³ / ₁₆ | 2 ¹ / ₂ | 1 ¹ / ₄ K-hole & smaller, 1 ¹ / ₂ 1 ¹ / ₈ K-hole and larger, 2 | 3 ³ / ₄ | 6 or less 6 ¹ / ₂ or more | 36 ³ / ₈ 41 ¹ / ₂ | 3 ¹ / ₄ + TT | 1 ¹ / ₂ | 1 ³ / ₄ |
| 50-63 | 46 ⁷ / ₈ | 28 ³ / ₈ | 8 ⁵ / ₁₆ | 5 ⁷ / ₈ | 4 | • | 18 | 11 ¹ / ₄ | 3 | 1 ¹⁵ / ₁₆ K-hole, 1 ¹ / ₂ 1 ¹ / ₈ thru 1 ³ / ₈ K-hole, 2 1 ¹ / ₂ K-hole and larger, 3 | 1 | 11 or less 11 ¹ / ₂ or more | 52 ¹ / ₂ 57 ³ / ₄ | 4 ¹ / ₄ + TT | 3 ³ / ₄ | 2 ¹ / ₄ |
| 64-74 | 68 | 36 ³ / ₄ | 1 ³ / ₁₆ | 7 ¹ / ₂ | 5 | 25 ³ / ₈ | 22 ³ / ₁₆ | 11 | 3 ³ / ₄ | 3 | 1 ¹ / ₂ | 10 ¹ / ₂ or less 11 or more | 77 ¹ / ₄ 77 ³ / ₈ | 5 ³ / ₄ + TT | 1 ¹ / ₄ | 2 ³ / ₄ |
| 75-83 | 69 ¹ / ₂ | 37 ¹ / ₄ | 1 ¹ / ₂ | 7 ¹ / ₂ | 6 ¹ / ₄ | 25 ³ / ₈ | 27 ¹ / ₁₆ | 11 | 3 ³ / ₄ | 3 ³ / ₄ | 1 | 10 ¹ / ₂ or less 11 or more | 77 ¹⁵ / ₁₆ 78 ¹ / ₁₆ | 5 ³ / ₄ + TT | 1 ¹ / ₂ | 3 ³ / ₄ * |
| 84-110 | See page 207 | | | | | | | | | | | | | | | |

Rod take-out = (factor) - (TT / 2), for lever in high position. • "I" dimension for sizes 10 through 63 equals "B" + "Q"

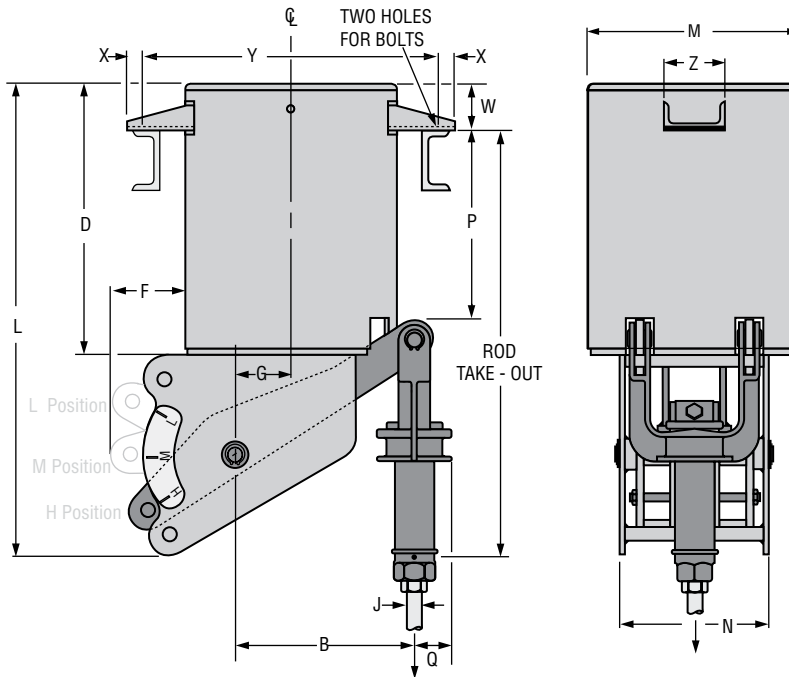
Note: See the size selection chart (page 196 through 199) for the "B" dimension. K hole center line location is determined by the formula of "B - G = K Center Line".

| Load (lbs) | 0 800 | 801 1,500 | 1,501 2,540 | 2,541 4,000 | 4,001 6,100 | 6,101 9,400 | 9,401 13,400 | 13,401 18,300 | 18,301 24,700 | 24,701 31,000 | 31,001 39,000 | 39,001 48,000 | 48,001 58,000 |
|-------------|---------------------------------|---------------------------------|---------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|---------------------------------|
| J-Rod Size | 1 ¹ / ₂ | 5 ⁵ / ₈ | 3 ³ / ₄ | 1 | 1 ¹ / ₄ | 1 ¹ / ₂ | 1 ³ / ₄ | 2 | 2 ¹ / ₄ | 2 ¹ / ₂ | 2 ³ / ₄ | 3 | 3 ¹ / ₄ * |
| K-Hole Size | 1 ¹¹ / ₁₆ | 1 ¹³ / ₁₆ | 1 ¹⁵ / ₁₆ | 1 ¹ / ₄ | 1 ¹ / ₂ | 1 ³ / ₄ | 2 | 2 ³ / ₈ | 2 ⁵ / ₈ | 2 ⁷ / ₈ | 3 ¹ / ₈ | 3 ³ / ₈ | 3 ⁵ / ₈ |
| S | 7 ⁷ / ₈ | 1 ¹ / ₁₆ | 1 ¹ / ₄ | 1 ¹ / ₈ | 2 | 2 ³ / ₈ | 2 ⁵ / ₈ | 2 ⁷ / ₈ | 3 ¹ / ₈ | 3 ³ / ₈ | 3 ⁵ / ₈ | 3 ⁷ / ₈ | 4 ¹ / ₈ |

* 3¹/₄" is furnished with 4 UNC series thread.

Fig. 80-V Type D

Model R



Type D rests on top of structural steel while most of the Constant Support itself hangs between or below the supporting beams. The depth of the beam is limited by the “P” dimension. Dimension “P” can be varied on special order, however, “P” dimension shown is maximum for the hanger.

Notes: See load travel tables, page 196 through 199 for “B” dimension. For weights see page 215. Location of travel indicator and contour of side plate may vary from that shown.

FIG. 80-V: DIMENSIONS (IN)

| Hanger Sizes | L | D | F | G | Dia. M | N | Q | P | W | X | Y | Z | Bracket Hole Dia. | Total Travel TT | Factors | J-Rod | | |
|--------------|--------------------------------|--------------------------------|--------------------------------|-------------------------------|--------------------------------|--------------------------------|-------------------------------|---------------------------------|-------------------------------|-------------------------------|--------------------------------|---|-------------------------------|--|--|------------------------------------|----------|-------------------------------|
| | | | | | | | | | | | | | | | | Min Thd Length | Min Dia. | Max Dia. |
| 1-9 | Available in Fig. 81-H only | | | | | | | | | | | | | | | | | |
| 10-18 | 18 ⁷ / ₈ | 8 ⁷ / ₈ | 2 | 1 ¹ / ₂ | 8 ⁵ / ₈ | 6 ⁷ / ₁₆ | 1 ³ / ₈ | 4 ¹⁵ / ₁₆ | 2 ³ / ₈ | 1 ¹ / ₂ | 10 ³ / ₄ | 3 | 3/4 | 5 or less 5 ¹ / ₂ or more | 15 ¹ / ₂ 17 ³ / ₁₆ | 1 ³ / ₄ + TT | 1/2 | 3/4 |
| 19-34 | 28 ¹ / ₂ | 16 | 2 ¹ / ₂ | 2 ⁵ / ₈ | 12 ³ / ₄ | 8 ⁹ / ₁₆ | 1 ³ / ₈ | 12 ¹ / ₂ | 2 ³ / ₈ | 1 ¹ / ₂ | 14 ⁷ / ₈ | 3 | 7/8 | 5 or less 5 ¹ / ₂ or more | 26 ¹¹ / ₁₆ 28 ¹³ / ₁₆ | 2 ³ / ₈ + TT | 1/2 | 1 ¹ / ₄ |
| 35-49 | 32 ³ / ₄ | 18 ¹ / ₄ | 4 ³ / ₄ | 3 ³ / ₄ | 14 | 9 ³ / ₁₆ | 2 ¹ / ₂ | 13 ¹ / ₄ | 2 ⁵ / ₈ | 2 | 16 ³ / ₄ | 4 | 1 ¹ / ₈ | 6 or less 6 ¹ / ₂ or more | 31 ¹ / ₄ 35 ⁷ / ₈ | 3 ¹ / ₄ + TT | 1/2 | 1 ³ / ₄ |
| 50-63 | 46 ⁷ / ₈ | 28 ¹ / ₈ | 8 ⁵ / ₁₆ | 5 ⁷ / ₈ | 18 | 11 ¹ / ₄ | 3 | 24 ¹ / ₂ | 2 ⁷ / ₈ | 3 | 21 | 6 | 1 ³ / ₈ | 11 or less 11 ¹ / ₂ or more | 45 ⁹ / ₁₆ 50 ⁷ / ₈ | 4 ¹ / ₄ + TT | 3/4 | 2 ¹ / ₄ |
| 64-83 | Available in Fig. 81-H only. | | | | | | | | | | | | | | | | | |
| 84-110 | Not Available | | | | | | | | | | | | | | | | | |

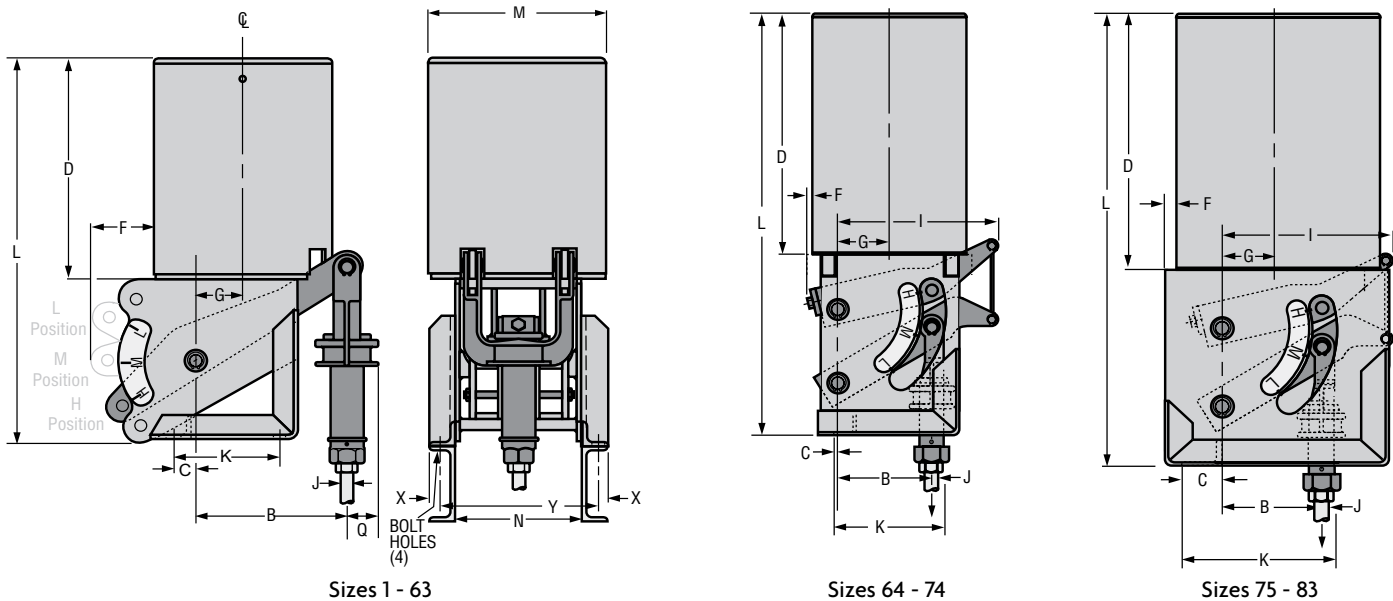
*Rod take-out = (factor) - (TT / 2), for lever in high position. • “I” dimension for sizes 10 through 63 equals “B” + “Q”
Note: See the size selection chart (page 196 through 199) for the “B” dimension.

| Load (lbs) | 0 800 | 801 1,500 | 1,501 2,540 | 2,541 4,000 | 4,001 6,100 | 6,101 9,400 | 9,401 13,400 | 13,401 18,300 | 18,301 24,700 |
|------------|----------|--------------|----------------|----------------|----------------|----------------|-----------------|------------------|------------------|
| J Rod Size | 1/2 | 5/8 | 3/4 | 1 | 1 1/4 | 1 1/2 | 1 3/4 | 2 | 2 1/4 |

CONSTANT SUPPORTS

Fig. 80-V Type E

Model R



Type E rests on top flange of structural steel and the constant support itself is entirely above the supporting beams. If the rod takeout does not exceed the depth of the supporting steel and the rod coupling must extend below the steel, specify the depth of the supporting steel. Increase the rod take-out by the depth of the steel.

Notes: See load travel tables, page 196 through 199 for "B" dimension. For weights see page 215. Location of travel indicator and contour of side plate may vary from that shown.

FIG. 80-V, TYPE E: DIMENSIONS (IN)

| Hanger Size | L | C | D | F | G | I | K | Dia. M | X | Y | N | Q | Angle Size | Bracket Hole Dia. | Total Travel TT | Factors | J-Rod | | |
|-------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|-------------------------------|--------------------------------|----------------------------------|---------------------------------|--------------------------------|----------------------------------|---------------------------------|-------------------------------|---|-------------------------------|--|--|--|------------------------------------|-------------------------------|
| | | | | | | | | | | | | | | | | | Min Thd Length | Rod Dia Min | Max |
| 1-9 | Available in Fig. 81-H Only | | | | | | | | | | | | | | | | | | |
| 10-18 | 18 ⁷ / ₈ | 1 ¹ / ₂ | 8 ⁷ / ₈ | 2 | 1 ¹ / ₂ | • | 4 ⁵ / ₁₆ | 8 ⁵ / ₈ | 5 ⁸ / ₈ | 8 ¹⁵ / ₁₆ | 6 ⁷ / ₁₆ | 1 ³ / ₈ | 1 ¹ / ₂ x 2 x 1/4 | 3/4 | 5 or less 5 ¹ / ₂ or more | 1 ⁷ / ₁₆ 3 ³ / ₄ | 1 ³ / ₄ + TT | 1/2 | 3/4 |
| 19-34 | 28 ¹ / ₂ | 1 ³ / ₁₆ | 16 | 2 ¹ / ₈ | 2 ⁵ / ₈ | • | 6 ¹¹ / ₁₆ | 12 ³ / ₄ | 5 ⁸ / ₈ | 11 ³ / ₁₆ | 8 ⁹ / ₁₆ | 1 ⁵ / ₈ | 1 ¹ / ₂ x 2 ¹ / ₂ x 1/4 | 3/4 | 5 or less 5 ¹ / ₂ or more | 2 ¹³ / ₁₆ 4 ¹⁵ / ₁₆ | 2 ³ / ₈ + TT | 1/2 | 1 ¹ / ₄ |
| 35-49 | 32 ³ / ₄ | 1 ⁷ / ₈ | 18 ¹ / ₄ | 4 ³ / ₄ | 3 ³ / ₄ | • | 8 ⁵ / ₁₆ | 14 | 1 ³ / ₁₆ | 13 ⁵ / ₁₆ | 9 ¹³ / ₁₆ | 2 ¹ / ₂ | 3 x 2 x 3/8 | 7/8 | 6 or less 6 ¹ / ₂ or more | 2 ¹ / ₂ 7 ¹ / ₈ | 3 ¹ / ₄ + TT | 1/2 | 1 ³ / ₄ |
| 50-63 | 46 ⁷ / ₈ | 3 ³ / ₄ | 28 ¹ / ₈ | 8 ⁵ / ₁₆ | 5 ⁷ / ₈ | • | 12 ¹³ / ₁₆ | 18 | 1 ⁵ / ₁₆ | 14 ¹¹ / ₁₆ | 11 ¹ / ₄ | 3 | 3 x 3 x 3/8 | 1 ³ / ₈ | 11 or less 11 ¹ / ₂ or more | 1 ⁵ / ₈ 7 | 4 ¹ / ₄ + TT | 3/4 | 2 ¹ / ₄ |
| 64-74 | 62 | 3/8 | 35 ³ / ₄ | 3/8 | 7 ¹ / ₂ | 25 ³ / ₈ | 15 ³ / ₄ | 22 ³ / ₁₆ | 1 ⁹ / ₁₆ | 14 ¹⁵ / ₁₆ | 11 | 3 | 3 ¹ / ₂ x 3 ¹ / ₂ x 1/2 | | 1 ⁵ / ₈ | 10 ¹ / ₂ or less 11 or more | 9 ¹ / ₈ 9 ¹ / ₄ | 5 ³ / ₄ + TT | 1 ¹ / ₄ |
| 75-83 | 62 ¹ / ₂ | 5 ¹ / ₄ | 35 ³ / ₄ | 1 ¹ / ₂ | 7 ¹ / ₂ | 25 ³ / ₈ | 25 ³ / ₈ | 27 ³ / ₁₆ | 1 ¹ / ₄ | 15 ¹ / ₂ | 11 | 3 | 4 x 4 x 3/8 | 1 ⁵ / ₈ | 10 ¹ / ₂ or less 11 or more | 8 ³ / ₄ 8 ⁷ / ₈ | 5 ³ / ₄ + TT | 1 ¹ / ₂ | 3 ³ / ₄ |
| 84-110 | Not Available | | | | | | | | | | | | | | | | | | |

Rod take-out = (factor) - (TT / 2), for lever in high position. Rod take-out is measured from the bottom of the supporting angles to the center of the load coupling site hole.
 • "I" dimension for sizes 10 through 63 equals "B" + "Q" Note: See the size selection chart (page 196 through 199) for the "B" dimension.

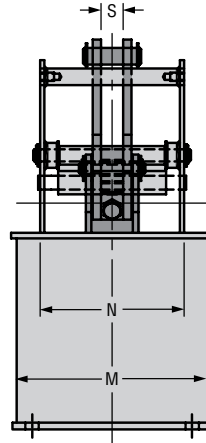
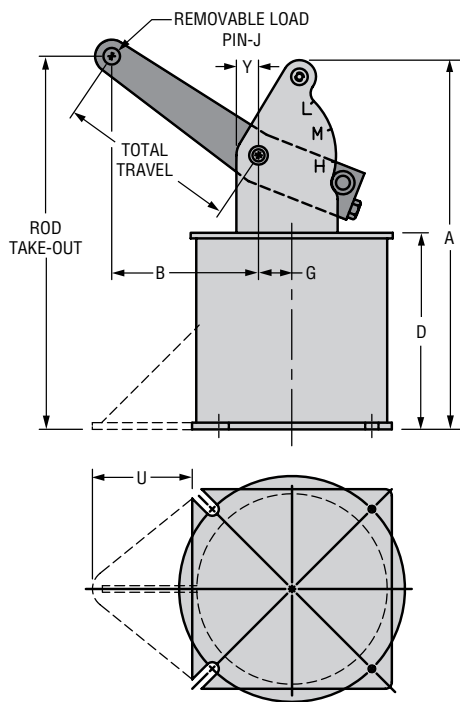
J-ROD SELECTION CHART

| Load (lbs) | 0 800 | 801 1,500 | 1,501 2,540 | 2,541 4,000 | 4,001 6,100 | 6,101 9,400 | 9,401 13,400 | 13,401 18,300 | 18,301 24,700 | 24,701 31,000 | 31,001 39,000 | 39,001 48,000 | 48,001 58,000 |
|------------|----------|--------------|----------------|----------------|----------------|----------------|-----------------|------------------|------------------|------------------|------------------|------------------|------------------|
| J Rod Size | 1/2 | 5/8 | 3/4 | 1 | 1 1/4 | 1 1/2 | 1 3/4 | 2 | 2 1/4 | 2 1/2 | 2 3/4 | 3 | 3 1/4* |

* 3 1/4" is furnished with 4 UNC series thread.

Fig. 80-V Type F

Model R



**FIG. 80-V, TYPE F:
TOTAL TRAVEL (IN)**

| Hanger Size | Total Travel | U |
|-------------|--------------|-----|
| 10-18 | 1½ - 4½ | – |
| | 5 - 8 | 5 |
| 19-34 | 2 - 6½ | – |
| | 7 - 10 | 7¼ |
| 35-49 | 2½ - 6 | – |
| | 6½ - 9 | 7 |
| | 9½ - 14 | 11½ |
| 50-63 | 3 - 6½ | – |
| | 7 - 10 | 8½ |
| | 10½ - 16 | 14 |

Type F is for support of piping or equipment from below. It has a base flange for fastening to the floor or to beams. The load arm is furnished with a removable load pin. The intermediate strut which runs from the load arm to the piping is not furnished and must be ordered separately, designed to the specific requirement.

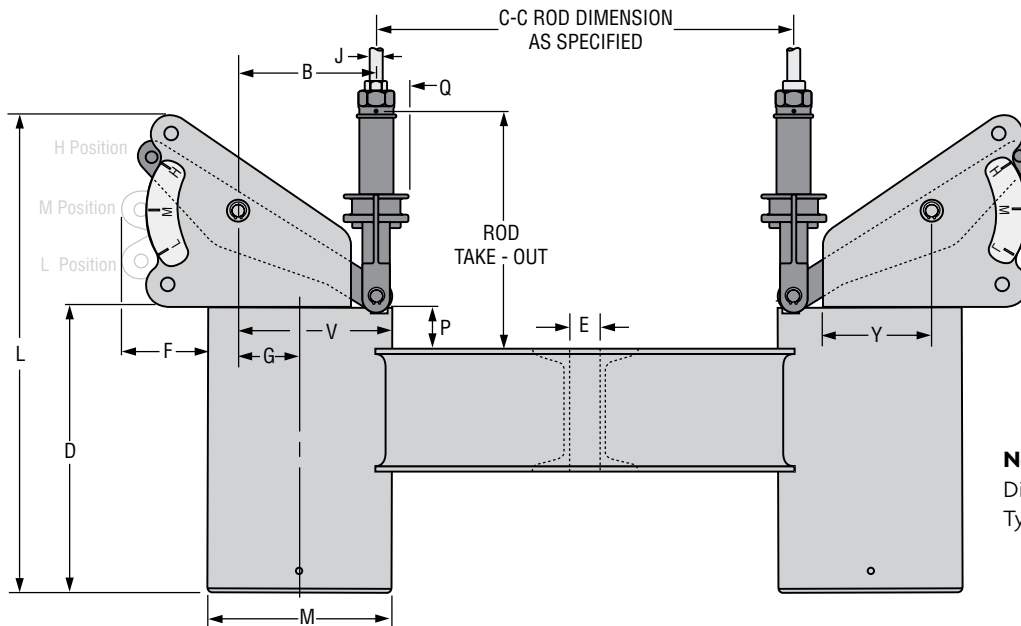
Note: See load travel table for “B” dimension.

FIG. 80-V, TYPE F: DIMENSIONS (IN)

| Hanger Size | A | D | G | M | N | S | Y | Bottom Flange Square | Bottom Flange Bolt Circle | Flange Hole and Slot Dia. | Flange Thickness | Factor | Total Travel | J Dia. |
|-------------|---------------|----------------------------------|---------------------------------|-----|--------------------------------|--------------------------------|----|----------------------|---------------------------|---------------------------|------------------|--------|--------------|-------------------------------|
| 1-9 | Not Available | | | | | | | | | | | | | |
| 10-18 | 16⅝ | 8¾ | 1½ | 8⅝ | 6¼ | 1 | 1 | 9 | 10 | 7/16 | ¼ | 12⅝ | 5½ or less | ¾ |
| | | | | | | | | | | | | | 6 or more | ½ |
| 19-34 | 25⅜ | 14 ¹¹ / ₁₆ | 2⅝ | 12¾ | 8⅝ | 1 ⁵ / ₁₆ | 1 | 13¼ | 15 | 5/8 | 3/8 | 20⅝ | 4 or less | 1 ¹ / ₈ |
| | | | | | | | | | | | | | 4½ or more | 7/8 |
| 35-49 | 32⅝ | 18½ | 3 ¹¹ / ₁₆ | 14 | 9 ⁵ / ₁₆ | 2¼ | 1½ | 14½ | 17 | 7/8 | 5/8 | 25½ | 7 or less | 1½ |
| | | | | | | | | | | | | | 7½ or more | 1⅝ |
| 50-63 | 48¾ | 28⅝ | 5⅞ | 18 | 11¼ | 2¼ | 1⅝ | 18½ | 21 | 1 | ¾ | 38½ | 8 or less | 2 |
| | | | | | | | | | | | | | 8½ or more | 1½ |
| 64-110 | Not Available | | | | | | | | | | | | | |

Fig. 80-V Type G

Model R



Note: For orientation of "N" Dimension, see Fig. 80-V Type D on page 203.

Type G is a complete trapeze assembly. The hanger consists of two vertical type Constant Support units plus a pair of channels, back-to-back, welded at each end to the hanger casing. In sizing a Type G hanger, it must be remembered that each standard spring unit carries one-half of the total pipe load. Furthermore, the weights of the hanger itself must be considered as part of the overall load. Therefore, using one-half the total pipe load, select the required hanger size from the Load Travel Table and add one-half the weight of the size hanger selected to one-half the total pipe load. If the load now exceeds the maximum load at the required total travel for the hanger size selected, it is necessary to go to the next larger hanger. If the pipe line is designed so as not to be centered on the channel, one

spring of the trapeze will carry a heavier load than the other and care must be taken in sizing the individual hanger units. The center-to-center rod dimension must be specified when ordering. The minimum C-C dimension can be determined as follows:

$$B \text{ plus } Q > Y: (\text{O.D. of pipe covering}) + 2Q.$$

$$B \text{ plus } Q < Y: (\text{O.D. of pipe covering}) + 2(Y - B).$$

Note: If U-bolt is used to fasten pipe to channels, C-C of U-bolt tangents plus one washer plate width cannot be greater than C-C of the hanger rods minus 2 (V minus B). See load travel tables, page 196 through 199 for "B" dimension.

For weights see page 215. Location of travel indicator and contour of side plate may vary from that shown.

FIG. 80-V, TYPE G: DIMENSIONS (IN)

| Hanger Size | L | D | E | F | G | Dia M | N | P | Q | V | Y | Channel Size (lbs/ft) | C - C | Total Travel TT | Factors | J-Rod | | |
|-------------|--------------------------------|--------------------------------|-------------------------------|--------------------------------|-------------------------------|--------------------------------|---------------------------------|--------------------------------|-------------------------------|---------------------------------|----------------------------------|-----------------------|-------|--|--|------------------------------------|--------------|-------------------------------|
| | | | | | | | | | | | | | | | | Min Thread Length | Min Rod Dia. | Max Rod Dia. |
| 1-9 | Not available | | | | | | | | | | | | | | | | | |
| 10-18 | 18 ⁷ / ₈ | 8 ⁷ / ₈ | 1 | 2 | 1 ¹ / ₂ | 8 ⁵ / ₁₆ | 6 ⁷ / ₁₆ | 2 ⁹ / ₁₆ | 1 ³ / ₈ | 5 ¹³ / ₁₆ | 6 ⁵ / ₈ | 4 @ 5.4 | 30 | 5 or less 5 ¹ / ₂ or more | 11 ¹¹ / ₁₆ 14 | 1 ³ / ₄ + TT | 1/2 | 3/4 |
| 19-34 | 28 ¹ / ₂ | 16 | 1 ¹ / ₄ | 2 ¹ / ₈ | 2 ⁵ / ₈ | 12 ³ / ₄ | 8 ⁹ / ₁₆ | 3 ⁹ / ₁₆ | 1 ⁵ / ₈ | 9 | 9 ⁵ / ₈ | 6 @ 10.5 | 42 | 5 or less 5 ¹ / ₂ or more | 16 ¹³ / ₁₆ 18 ³ / ₄ | 2 ³ / ₈ + TT | 1/2 | 1 ¹ / ₄ |
| 35-49 | 32 ³ / ₄ | 18 ¹ / ₄ | 1 ¹ / ₂ | 4 ¹ / ₄ | 3 ³ / ₄ | 14 | 9 ¹³ / ₁₆ | 3 ³ / ₁₆ | 2 ¹ / ₂ | 10 ³ / ₄ | 11 ¹ / ₁₆ | 10 @ 15.3 | 48 | 6 or less 6 ¹ / ₂ or more | 19 ¹ / ₄ 23 ³ / ₈ | 3 ¹ / ₄ + TT | 1/2 | 1 ³ / ₄ |
| 50-63 | 46 ⁷ / ₈ | 28 ³ / ₈ | 2 ¹ / ₈ | 8 ⁵ / ₁₆ | 5 ⁷ / ₈ | 18 | 11 ¹ / ₄ | 4 | 3 | 14 ³ / ₄ | 10 ¹⁵ / ₁₆ | 12 @ 20.7 | 48 | 11 or less 11 ¹ / ₂ or more | 24 ⁵ / ₈ 30 | 4 ¹ / ₄ + TT | 3/4 | 2 ¹ / ₄ |
| 64-110 | Not available | | | | | | | | | | | | | | | | | |

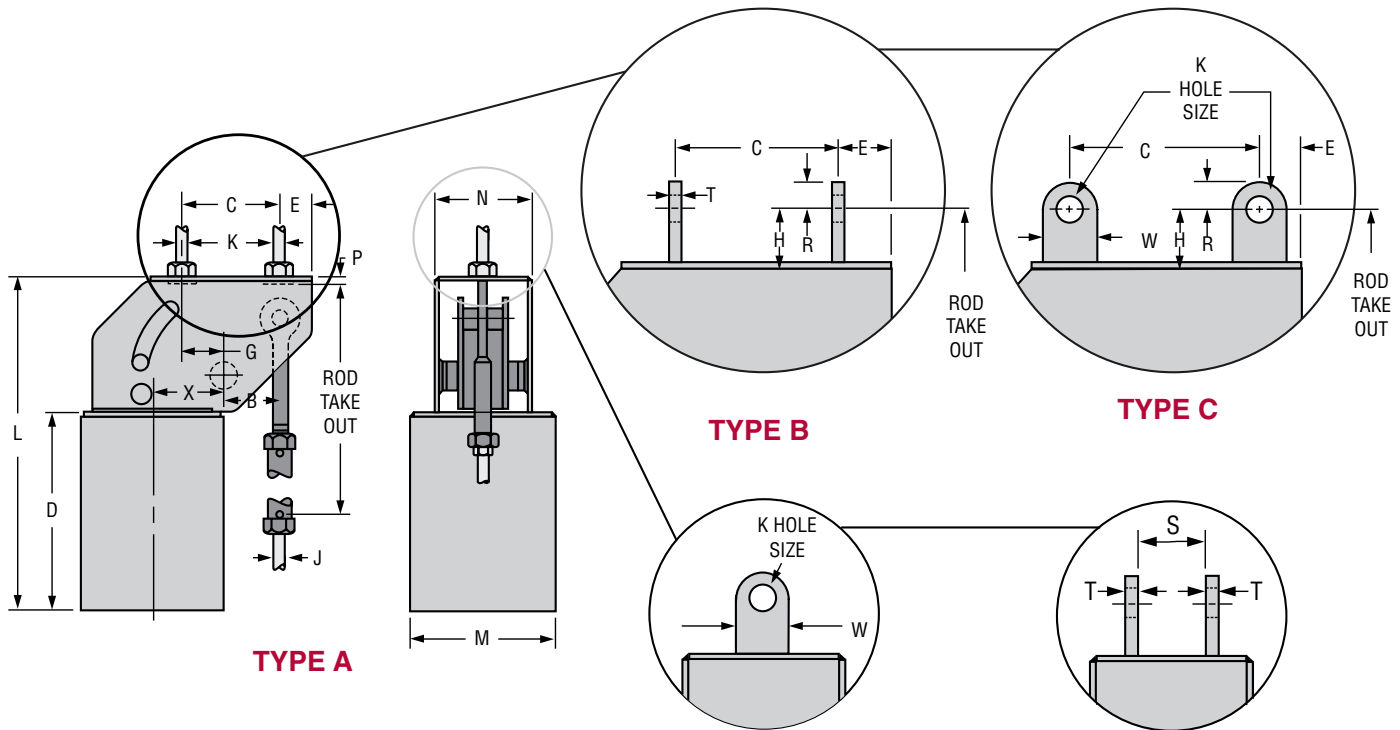
Rod take-out = (factor) - (TT / 2), for lever in high position.

Note: See the size selection chart (see page 196 through 199) for the "B" dimension.

| Load (lbs) | 0 800 | 801 1,500 | 1,501 2,540 | 2,541 4,000 | 4,001 6,100 | 6,101 9,400 | 9,401 13,400 | 13,401 18,300 | 18,301 24,700 |
|------------|----------|--------------|----------------|----------------|-------------------------------|-------------------------------|-------------------------------|------------------|-------------------------------|
| J Rod Size | 1/2 | 5/8 | 3/4 | 1 | 1 ¹ / ₄ | 1 ¹ / ₂ | 1 ³ / ₄ | 2 | 2 ¹ / ₄ |

Fig. 80-V Types A, B and C

Model R, Sizes 84 to 110



Note: "B" Dimensions is a function of total travel ("G" + "B" should not be assumed as equal to "C" Dimension)

Types A, B, and C sizes 84 through 110, for large loads and long travels, provide for basically the same methods of upper attachment as sizes 10 to 83 shown Type A on page 200, Type B page 201 and Type C see page 202.

Notes: See load travel tables, page 196 through 199 for "B" dimension. For weights see page 215.

FIG. 80-V, TYPES A,B,C SIZES 84 TO 110: DIMENSIONS (IN)

| Hanger Sizes | L | C | | D | E | | G | | H | M | N | P | X | Total Travel TT | Factor | | J - Rod | | |
|--------------|-----|------------|--------|-----|------------|--------|--------|------------|---|----|-----|----|-----|-----------------|-------------------|----------|---------|----|----|
| | | Type A & B | Type C | | Type A & B | Type C | Type A | Type B & C | | | | | | | Min Thread Length | Rod Dia. | | | |
| | | Min | Max | | | | | | | | | | | | | | | | |
| 84-94 | 78¾ | 16 | 15 | 49¾ | 4 | 4½ | 1½ | 1 | 6 | 24 | 10½ | 3 | 12 | 9½ or less | 45¾ | 54¾ | 10 | 2 | 3¾ |
| | | | | | | | | | | | | | | 10 or more | 55½ | 64½ | 13 | | |
| 95-110 | 100 | 24 | 23 | 64 | 4 | 4½ | 7½ | 7 | 6 | 24 | 11½ | 3½ | 13½ | 14 or less | 51⅛ | 60⅝ | 12 | 2½ | 3¾ |
| | | | | | | | | | | | | | | 14½ or more | 60⅞ | 69⅞ | 15 | | |

*Rod take-out = (factor) - (.75 x TT), for Lever in high position
 Note: See the size selection chart (page 196 through 199) for the "B" dimension.

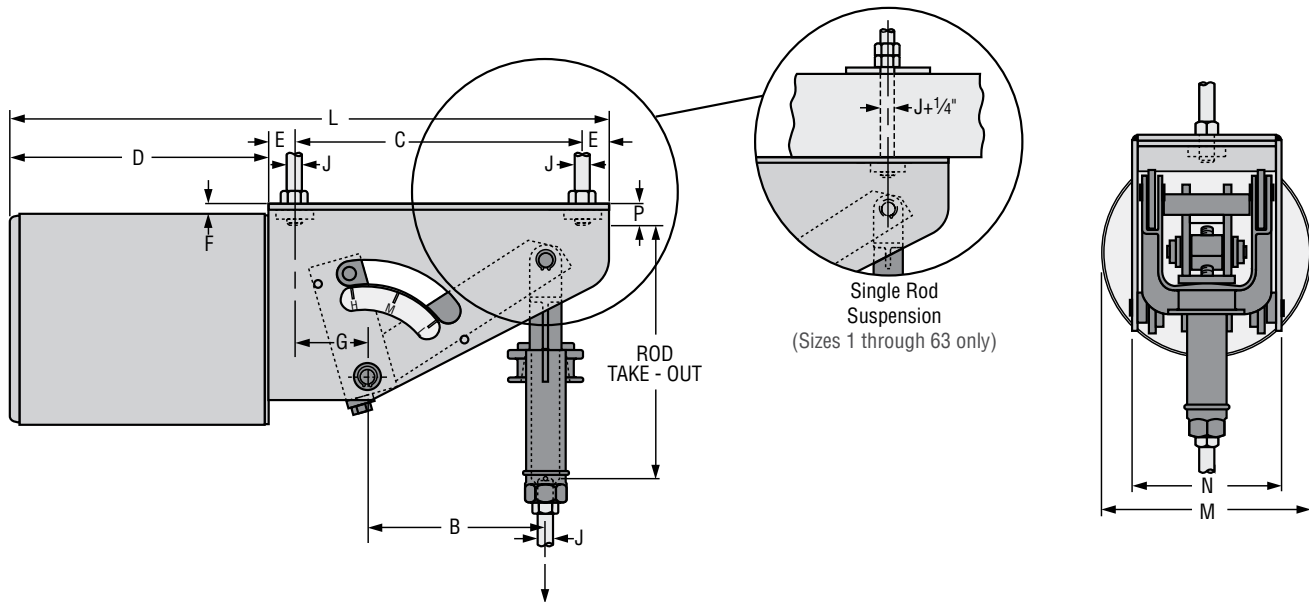
| Load (lbs) | 14,376 18,300 | 18,301 24,700 | 24,701 31,000 | 31,001 39,000 | 39,001 48,000 | 48,001 58,000 | 58,001 69,000 | 69,001 87,500 |
|------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| J & K-Rods | 2 | 2¼ | 2½ | 2¾ | 3 | 3¼* | 3½* | 3¾* |
| K-Hole | 2⅝ | 2⅞ | 2⅞ | 3⅛ | 3⅜ | 3⅝ | 3⅞ | 4⅞ |
| R | 3 | 3 | 4 | 4 | 4 | 4½ | 4½ | 4½ |
| S | 2⅞ | 3⅞ | 3⅞ | 3⅞ | 3⅞ | 4⅞ | 4⅞ | 4⅞ |
| T (Type B) | ¾ | ¾ | 1 | 1 | 1 | 1 | 1½ | 1¾ |
| T (Type C) | | | | | | | 1¼ | 1¼ |
| W | 6 | 6 | 8 | 8 | 8 | 9 | 9 | 9 |

*¾ and larger is furnished with 4 UNC series thread.

CONSTANT SUPPORTS

Fig. 81-H Type A

Model R



Type A of the Figure 81- H Horizontal Design Model R Constant Support Hanger is designed for attaching to its supporting member by screwing two rods into tapped holes in the top of the hanger from a distance equal to the “P” dimension plus $\frac{3}{8}$ ”. Sizes 1 to 9 are furnished with swivel eye and turnbuckle instead of yoke and coupling.

Notes: Also available for single rod suspension as indicated above. When ordering specify “ for single rod suspension”. See load travel tables, page 196 through 199 for “B” dimension. For weights see page 215. Location of travel indicator and contour of side plate may vary from that shown.

FIG. 81-H TYPE A: DIMENSIONS (IN)

| Hanger Sizes | D | E | F | G | M | N | P | Total Travel TT | L | C | Factors | J-Rod | | |
|--------------|-------------------|-------------------|------------------|-------------------|--------------------|------------------|------------------|--------------------------|--------------------|------------------|--------------------|----------------------|-----------------|-----------------|
| | | | | | | | | | | | | Min Thread Length | Rod Dia. | |
| | | | | | | | | | | | | | Min | Max |
| 1-9 | 8 $\frac{1}{4}$ | 1 | $\frac{7}{8}$ | 2 | 6 $\frac{1}{8}$ | 4 $\frac{1}{8}$ | 1 $\frac{3}{16}$ | 4 or less | 16 $\frac{1}{4}$ | 6 | 12 $\frac{3}{4}$ | 1 $\frac{3}{4}$ + TT | $\frac{1}{2}$ | $\frac{1}{2}$ |
| | | | | | | | | 4 $\frac{1}{2}$ or more | 20 $\frac{1}{4}$ | 10 | 15 $\frac{5}{16}$ | | | |
| 10-18 | 8 $\frac{7}{16}$ | 1 | $\frac{1}{2}$ | 2 $\frac{9}{16}$ | 8 $\frac{5}{16}$ | 6 $\frac{7}{16}$ | 1 $\frac{1}{16}$ | 5 or less | 18 $\frac{7}{16}$ | 8 | 10 $\frac{7}{8}$ | 1 $\frac{3}{4}$ + TT | $\frac{1}{2}$ | $\frac{3}{4}$ |
| | | | | | | | | 5 $\frac{1}{2}$ or more | 21 $\frac{7}{16}$ | 11 | 13 $\frac{1}{4}$ | | | |
| 19-34 | 14 $\frac{7}{16}$ | 1 $\frac{1}{4}$ | $\frac{5}{8}$ | 3 $\frac{3}{8}$ | 12 $\frac{7}{16}$ | 8 $\frac{9}{16}$ | 1 $\frac{1}{8}$ | 5 or less | 26 $\frac{15}{16}$ | 10 | 16 $\frac{3}{4}$ | 2 $\frac{3}{8}$ + TT | $\frac{1}{2}$ | 1 $\frac{1}{4}$ |
| | | | | | | | | 5 $\frac{1}{2}$ or more | 31 $\frac{1}{16}$ | 14 $\frac{1}{8}$ | 18 $\frac{1}{8}$ | | | |
| 35-49 | 17 $\frac{7}{16}$ | 1 $\frac{3}{4}$ | 1 $\frac{1}{16}$ | 4 $\frac{3}{4}$ | 13 $\frac{3}{4}$ | 9 $\frac{3}{16}$ | 1 $\frac{3}{8}$ | 6 or less | 31 $\frac{9}{16}$ | 11 | 21 $\frac{1}{8}$ | 3 $\frac{1}{4}$ + TT | $\frac{1}{2}$ | 1 $\frac{3}{4}$ |
| | | | | | | | | 6 $\frac{1}{2}$ or more | 39 $\frac{9}{16}$ | 19 | 25 $\frac{3}{4}$ | | | |
| 50-63 | 26 $\frac{3}{16}$ | 1 $\frac{11}{16}$ | 1 $\frac{5}{16}$ | 7 $\frac{11}{16}$ | 17 $\frac{11}{16}$ | 11 $\frac{1}{4}$ | 1 $\frac{3}{4}$ | 8 or less | 45 $\frac{9}{16}$ | 16 | 24 $\frac{15}{16}$ | 4 $\frac{1}{4}$ + TT | $\frac{3}{4}$ | 2 $\frac{1}{4}$ |
| | | | | | | | | 8 $\frac{1}{2}$ to 11 | 53 $\frac{9}{16}$ | 24 | 24 $\frac{15}{16}$ | | | |
| | | | | | | | | 11 $\frac{1}{2}$ or more | 53 $\frac{9}{16}$ | 24 | 30 $\frac{1}{4}$ | | | |
| 64-74 | 35 $\frac{3}{4}$ | 3 | 3 $\frac{3}{4}$ | 5 $\frac{1}{4}$ | 22 $\frac{3}{16}$ | 11 | 3 $\frac{7}{16}$ | 10 $\frac{1}{2}$ or less | 57 $\frac{1}{2}$ | 15 $\frac{3}{4}$ | 34 $\frac{7}{16}$ | 5 $\frac{3}{4}$ + TT | 1 $\frac{1}{4}$ | 2 $\frac{3}{4}$ |
| | | | | | | | | 11 or more | 63 | 21 $\frac{1}{4}$ | 34 $\frac{9}{16}$ | | | |
| 75-83 | 35 $\frac{3}{4}$ | 3 $\frac{3}{4}$ | 3 $\frac{5}{8}$ | 5 | 27 $\frac{3}{16}$ | 11 | 4 $\frac{1}{4}$ | 10 $\frac{1}{2}$ or less | 57 $\frac{1}{2}$ | 15 $\frac{3}{4}$ | 36 $\frac{1}{2}$ | 5 $\frac{3}{4}$ + TT | 1 $\frac{1}{2}$ | 3 $\frac{1}{4}$ |
| | | | | | | | | 11 or more | 63 | 20 $\frac{3}{4}$ | 36 $\frac{5}{8}$ | | | |
| 84-110 | See page 214 | | | | | | | | | | | | | |

*Rod take-out = (factor)-(TT / 2) for lever in high position.

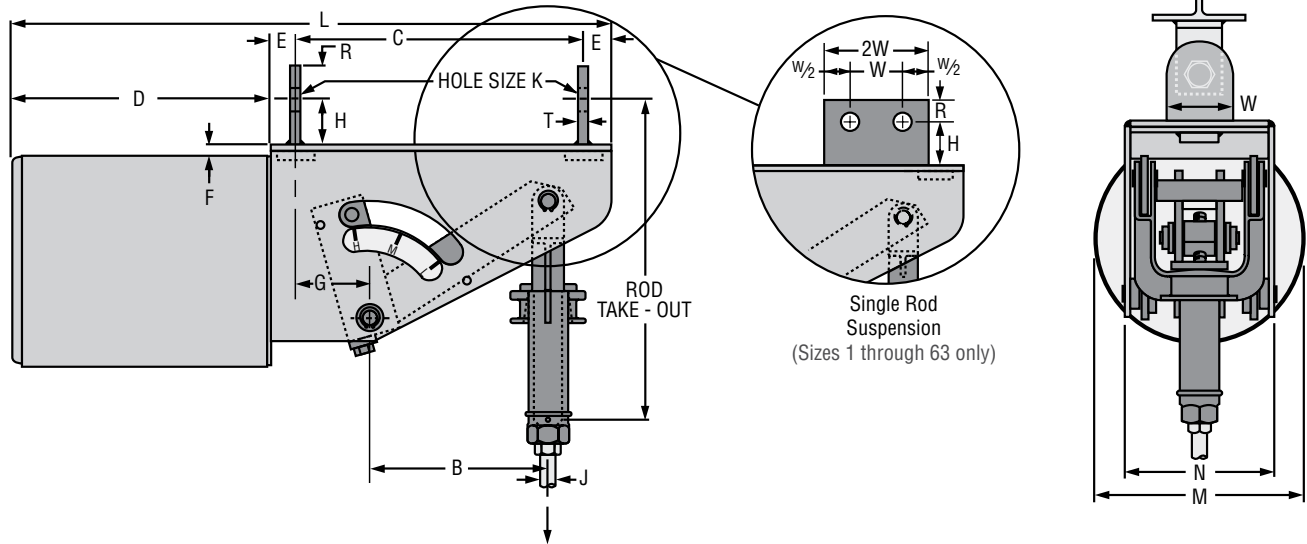
J-ROD SELECTION CHART

| Load (lbs) | 0 800 | 801 1,500 | 1,501 2,540 | 2,541 4,000 | 4,001 6,100 | 6,101 9,400 | 9,401 13,400 | 13,401 18,300 | 18,301 24,700 | 24,701 31,000 | 31,001 39,000 | 39,001 48,000 | 48,001 58,000 |
|------------|---------------|---------------|----------------|----------------|-----------------|-----------------|-----------------|------------------|------------------|------------------|------------------|------------------|-------------------|
| Rod Size | $\frac{1}{2}$ | $\frac{5}{8}$ | $\frac{3}{4}$ | 1 | 1 $\frac{1}{4}$ | 1 $\frac{1}{2}$ | 1 $\frac{3}{4}$ | 2 | 2 $\frac{1}{4}$ | 2 $\frac{1}{2}$ | 2 $\frac{3}{4}$ | 3 | 3 $\frac{1}{4}$ * |

* 3 $\frac{1}{4}$ " is furnished with 4 UNC series thread.

Fig. 81-H Type B

Model R



Type B is furnished with two lugs – one at each end of the hanger frame. These lugs permit use of Fig. 66 welded beam attachments, clevises or angle clips for attachment where headroom is limited. Sizes 1 to 9 are furnished with swivel eye and turnbuckle instead of yoke and coupling.

Notes: Also available for single rod suspension as indicated above. When ordering specify “for single rod suspension.” See load travel tables, page 196 through 199 for “B” dimension. For weights see page 215. Location of travel indicator and contour of side plate may vary from that shown.

FIG. 81-H TYPE B: DIMENSIONS (IN)

| Hanger Sizes | D | E | F | G | H | M | N | Total Travel TT | L | C | Factors | J-Rod | | |
|--------------|----------------------------------|-------------------------------|--------------------------------|--------------------------------|-------------------------------|---------------------------------|---------------------------------|--|----------------------------------|--------------------------------|----------------------------------|------------------------------------|-------------------------------|----------------------------------|
| | | | | | | | | | | | | Min Thd Length | Rod Dia. | |
| | | | | | | | | | | | | | Min | Max |
| 1 - 9 | 8 ¹ / ₄ | 1 ¹ / ₄ | 7 ⁷ / ₈ | 1 ³ / ₄ | 1 ¹ / ₂ | 6 ¹ / ₈ | 4 ¹ / ₈ | 4 or less | 16 ¹ / ₄ | 5 ¹ / ₂ | 14 ⁵ / ₈ | 1 ³ / ₄ + TT | 1/2 | 1/2 |
| | | | | | | | | 4 ¹ / ₂ or more | 20 ¹ / ₄ | 9 ¹ / ₂ | 17 ³ / ₁₆ | | | |
| 10 - 18 | 8 ⁷ / ₁₆ | 1 ¹ / ₄ | 1/2 | 2 ⁵ / ₁₆ | 1 ¹ / ₂ | 8 ⁵ / ₁₆ | 6 ⁷ / ₁₆ | 5 or less | 18 ¹ / ₁₆ | 7 ¹ / ₂ | 13 ¹ / ₁₆ | 1 ³ / ₄ + TT | 1/2 | 3/4 |
| | | | | | | | | 5 ¹ / ₂ or more | 21 ¹ / ₁₆ | 10 ¹ / ₂ | 15 ¹ / ₁₆ | | | |
| 19 - 34 | 14 ⁷ / ₁₆ | 1 ³ / ₈ | 5/8 | 3 ³ / ₄ | 2 | 12 ⁷ / ₁₆ | 8 ⁹ / ₁₆ | 5 or less | 26 ¹⁵ / ₁₆ | 9 ³ / ₄ | 19 ⁷ / ₈ | 2 ³ / ₈ + TT | 1/2 | 1 ¹ / ₄ |
| | | | | | | | | 5 ¹ / ₂ or more | 31 ¹ / ₁₆ | 13 ³ / ₈ | 22 | | | |
| 35 - 49 | 16 ¹³ / ₁₆ | 2 | 1 ¹ / ₁₆ | 4 ¹ / ₂ | 3 | 13 ³ / ₄ | 9 ¹³ / ₁₆ | 6 or less | 31 ¹ / ₁₆ | 10 ¹ / ₂ | 25 ⁵ / ₈ | 3 ¹ / ₄ + TT | 1/2 | 1 ³ / ₄ |
| | | | | | | | | 6 ¹ / ₂ or more | 39 ⁹ / ₁₆ | 18 ¹ / ₂ | 30 ¹ / ₈ | | | |
| 50 - 63 | 26 ³ / ₁₆ | 3 | 1 ⁵ / ₁₆ | 6 ³ / ₈ | 4 | 17 ³ / ₈ | 11 ¹ / ₄ | 8 or less | 45 ⁵ / ₁₆ | 13 ³ / ₈ | 30 ¹¹ / ₁₆ | 4 ¹ / ₄ + TT | 3/4 | 2 ¹ / ₄ |
| | | | | | | | | 8 ¹ / ₂ to 11 | 53 ³ / ₁₆ | 21 ³ / ₈ | 30 ¹¹ / ₁₆ | | | |
| 64 - 74 | 35 ³ / ₄ | 3 ³ / ₄ | 3 ³ / ₄ | 5 | 4 ¹ / ₂ | 22 ³ / ₁₆ | 11 | 11 ¹ / ₂ or more | 53 ³ / ₁₆ | 21 ³ / ₈ | 36 | 5 ³ / ₄ + TT | 1 ¹ / ₄ | 2 ³ / ₄ |
| | | | | | | | | 10 ¹ / ₂ or less | 57 ¹ / ₂ | 15 ¹ / ₄ | 42 ³ / ₈ | | | |
| 75 - 83 | 35 ³ / ₄ | 3 ¹ / ₂ | 3 ⁵ / ₈ | 4 ³ / ₄ | 5 | 27 ³ / ₁₆ | 11 | 10 ¹ / ₂ or less | 57 ¹ / ₂ | 14 ³ / ₄ | 45 ³ / ₄ | 5 ³ / ₄ + TT | 1 ¹ / ₂ | 3 ¹ / ₄ ** |
| | | | | | | | | 11 or more | 63 | 20 ¹ / ₄ | 45 ⁷ / ₈ | | | |
| 84 - 110 | See page 214 | | | | | | | | | | | | | |

* Rod take-out = (factor) - (TT / 2), for lever in high position.

J-ROD AND K-HOLE SELECTION CHART

| Load (lbs) | 0 800 | 801 1,500 | 1,501 2,540 | 2,541 4,000 | 4,001 6,100 | 6,101 9,400 | 9,401 13,400 | 13,401 18,300 | 18,301 24,700 | 24,701 31,000 | 31,001 39,000 | 39,001 48,000 | 48,001 58,000 |
|-------------|--------------------------------|--------------------------------|--------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|----------------------------------|
| J-rod | 1/2 | 5/8 | 3/4 | 1 | 1 ¹ / ₄ | 1 ¹ / ₂ | 1 ³ / ₄ | 2 | 2 ¹ / ₄ | 2 ¹ / ₂ | 2 ³ / ₄ | 3 | 3 ¹ / ₄ ** |
| K-Hole Size | 1 ¹ / ₁₆ | 1 ³ / ₁₆ | 1 ⁵ / ₁₆ | 1 ¹ / ₄ | 1 ¹ / ₂ | 1 ³ / ₄ | 2 | 2 ³ / ₈ | 2 ⁵ / ₈ | 2 ⁷ / ₈ | 3 ¹ / ₈ | 3 ³ / ₈ | 3 ⁵ / ₈ |
| R | 1 ¹ / ₄ | 1 ¹ / ₄ | 1 ¹ / ₄ | 1 ¹ / ₂ | 2 | 2 ¹ / ₂ | 2 ¹ / ₂ | 3 | 3 | 4 | 4 | 4 | 4 ¹ / ₂ |
| T | 1/4* | 1/4* | 3/8 | 1/2 | 5/8 | 3/4 | 3/4 | 3/4 | 3/4 | 1 | 1 | 1 | 1 |
| W | 2 ¹ / ₂ | 2 ¹ / ₂ | 2 ¹ / ₂ | 3 | 4 | 5 | 5 | 6 | 6 | 8 | 8 | 8 | 9 |

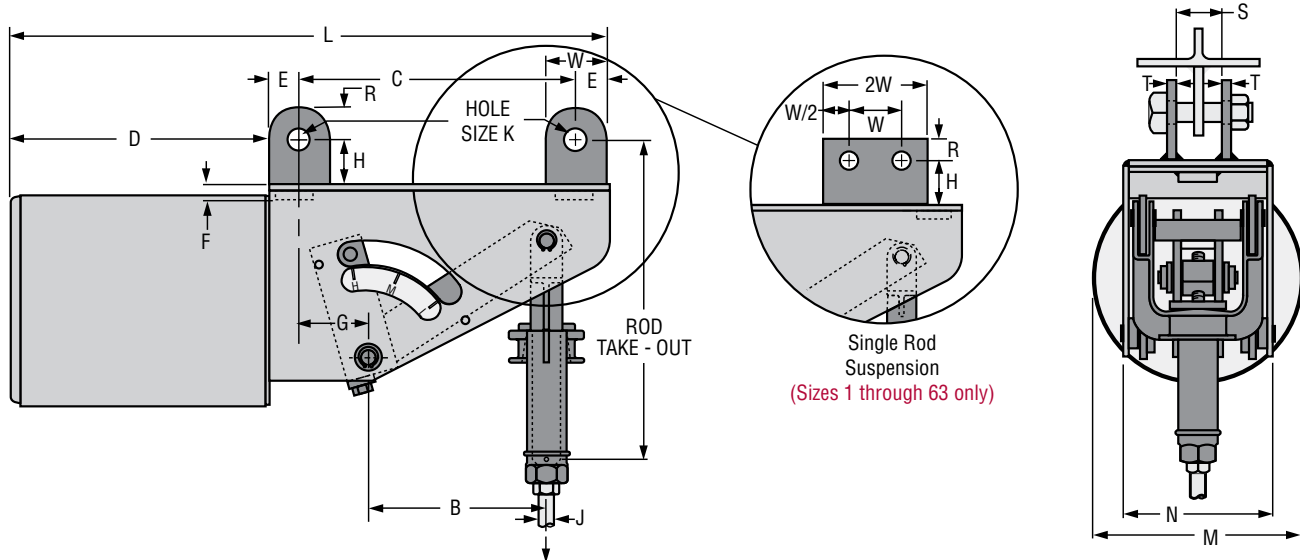
* 3/8" for single rod suspension ** 3/4" is furnished with 4 UNC series thread.



CONSTANT SUPPORTS

Fig. 81-H Type C

Model R



Type C is furnished with two pair of lugs, one pair of lugs at each of the hanger frame. These lugs permit the use of two eye rods or two single plates for attachment where headroom is limited. Sizes 1 to 9 are furnished with swivel eye and turnbuckle instead of yoke and coupling.

Notes: Also available for single rod suspension as indicated above. When ordering specify "for single rod suspension." See load travel tables, page 196 through 199 for "B" dimension. For weights see page 215. Location of travel indicator and contour of side plate may vary from that shown.

FIG. 81-H TYPE C: DIMENSIONS (INCHES)

| Hanger Sizes | D | E | F | G | H | M | N | Total Travel TT | L | C | Factors | J-Rod | | |
|--------------|---------------------------------|-------------------------------|--------------------------------|--------------------------------|-------------------------------|----------------------------------|---------------------------------|--|----------------------------------|--------------------------------|----------------------------------|------------------------------------|-------------------------------|-------------------------------|
| | | | | | | | | | | | | Min Thd Length | Rod Dia. | |
| | | | | | | | | | | | | Min | Max | |
| 1 - 9 | 8 ¹ / ₄ | 1 ¹ / ₄ | 7 ⁷ / ₈ | 1 ³ / ₄ | 1 ¹ / ₂ | 6 ⁵ / ₈ | 4 ¹ / ₈ | 4 or less | 16 ¹ / ₄ | 5 ¹ / ₂ | 14 ³ / ₈ | 1 ³ / ₄ + TT | 1/2 | 1/2 |
| | | | | | | | | 4 ¹ / ₂ or more | 20 ³ / ₄ | 9 ¹ / ₂ | 17 ³ / ₁₆ | | | |
| 10 - 18 | 8 ⁷ / ₁₆ | 1 ¹ / ₄ | 1/2 | 2 ⁵ / ₁₆ | 1 ¹ / ₂ | 8 ⁵ / ₁₆ | 6 ⁷ / ₁₆ | 5 or less | 18 ¹ / ₁₆ | 7 ¹ / ₂ | 13 ¹ / ₁₆ | 1 ³ / ₄ + TT | 1/2 | 3/4 |
| | | | | | | | | 5 ¹ / ₂ or more | 21 ¹ / ₁₆ | 10 ¹ / ₂ | 15 ³ / ₁₆ | | | |
| 19 - 34 | 14 ⁷ / ₁₆ | 2 | 5/8 | 3 ³ / ₈ | 2 | 12 ⁷ / ₁₆ | 8 ⁹ / ₁₆ | 5 or less | 26 ¹⁵ / ₁₆ | 8 ¹ / ₂ | 19 ⁷ / ₈ | 2 ³ / ₈ + TT | 1/2 | 1 ¹ / ₄ |
| | | | | | | | | 5 ¹ / ₂ or more | 31 ¹ / ₁₆ | 12 ⁵ / ₈ | 22 | | | |
| 35 - 49 | 17 ¹ / ₁₆ | 2 ¹ / ₂ | 1 ¹ / ₁₆ | 4 | 3 | 13 ³ / ₄ | 9 ¹³ / ₁₆ | 6 or less | 31 ¹ / ₁₆ | 9 ¹ / ₂ | 25 ⁵ / ₈ | 3 ¹ / ₄ + TT | 1/2 | 1 ³ / ₄ |
| | | | | | | | | 6 ¹ / ₂ or more | 39 ⁹ / ₁₆ | 17 ¹ / ₂ | 30 ⁷ / ₈ | | | |
| 50 - 63 | 26 ³ / ₁₆ | 3 | 1 ⁵ / ₁₆ | 6 ³ / ₈ | 4 | 17 ¹¹ / ₁₆ | 11 ¹ / ₄ | 8 or less | 45 ⁵ / ₁₆ | 13 ³ / ₈ | 30 ¹¹ / ₁₆ | 4 ¹ / ₄ + TT | 3/4 | 2 ¹ / ₄ |
| | | | | | | | | 8 ¹ / ₂ to 11 | 53 ³ / ₁₆ | 21 ³ / ₈ | 30 ¹¹ / ₁₆ | | | |
| | | | | | | | | 11 ¹ / ₂ or more | 53 ³ / ₁₆ | 21 ³ / ₈ | 36 | | | |
| 64 - 74 | 35 ³ / ₄ | 4 | 3 ¹ / ₄ | 4 ¹ / ₄ | 4 ¹ / ₂ | 22 ³ / ₁₆ | 11 | 10 ¹ / ₂ or less | 57 ¹ / ₂ | 13 ³ / ₄ | 42 ³ / ₈ | 5 ³ / ₄ + TT | 1 ¹ / ₄ | 2 ³ / ₄ |
| | | | | | | | | 11 or more | 63 | 19 ¹ / ₄ | 42 ¹ / ₂ | | | |
| 75 - 83 | 35 ³ / ₄ | 4 ¹ / ₂ | 3 ⁵ / ₈ | 3 ³ / ₄ | 5 | 27 ³ / ₁₆ | 11 | 10 ¹ / ₂ or less | 57 ¹ / ₂ | 12 ³ / ₄ | 45 ³ / ₄ | 5 ³ / ₄ + TT | 1 ¹ / ₂ | 3 ¹ / ₄ |
| | | | | | | | | 11 or more | 63 | 18 ¹ / ₄ | 45 ³ / ₄ | | | |
| 84 - 110 | See page 214 | | | | | | | | | | | | | |

* Rod take-out = (factor) - (TT / 2), for lever in high position.

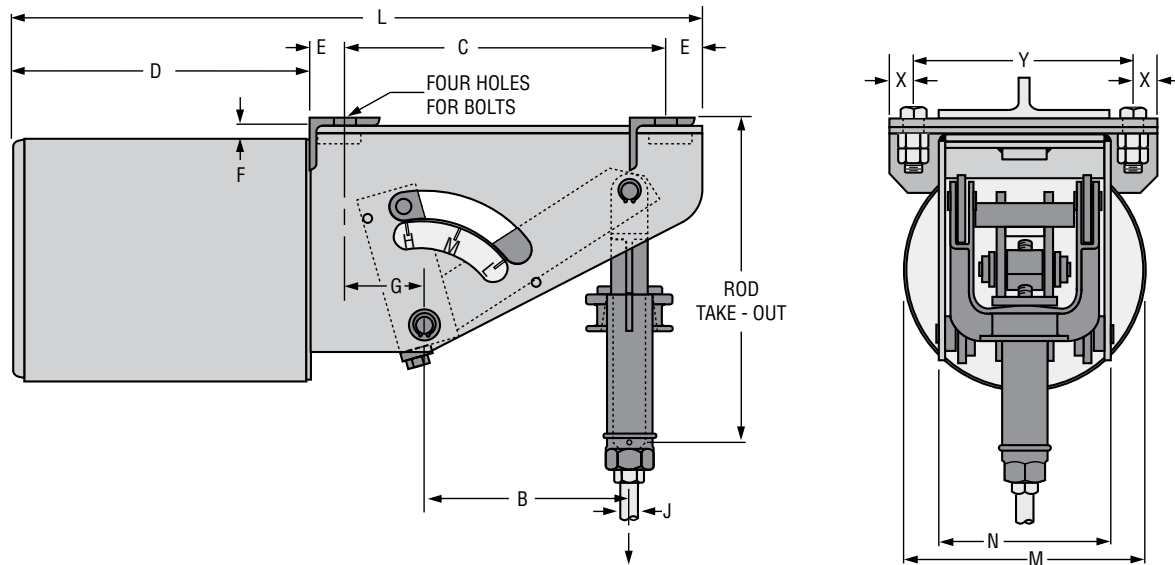
J-ROD AND K-HOLE SELECTION CHART

| Load (lbs) | 0 800 | 801 1,500 | 1,501 2,540 | 2,541 4,000 | 4,001 6,100 | 6,101 9,400 | 9,401 13,400 | 13,401 18,300 | 18,301 24,700 | 24,701 31,000 | 31,001 39,000 | 39,001 48,000 | 48,001 58,000 |
|-------------|--------------------------------|--------------------------------|--------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|----------------------------------|
| J-Rod | 1/2 | 5/8 | 3/4 | 1 | 1 ¹ / ₄ | 1 ¹ / ₂ | 1 ³ / ₄ | 2 | 2 ¹ / ₄ | 2 ¹ / ₂ | 2 ³ / ₄ | 3 | 3 ¹ / ₄ ** |
| K-Hole Size | 1 ¹ / ₁₆ | 1 ³ / ₁₆ | 1 ⁵ / ₁₆ | 1 ¹ / ₄ | 1 ¹ / ₂ | 1 ³ / ₄ | 2 | 2 ³ / ₈ | 2 ⁵ / ₈ | 2 ⁷ / ₈ | 3 ¹ / ₈ | 3 ³ / ₈ | 3 ⁵ / ₈ |
| R | 1 ¹ / ₄ | 1 ¹ / ₄ | 1 ¹ / ₄ | 1 ¹ / ₂ | 2 | 2 ¹ / ₂ | 2 ¹ / ₂ | 3 | 3 | 4 | 4 | 4 | 4 ¹ / ₂ |
| S | 7/8 | 1 ¹ / ₁₆ | 1 ¹ / ₄ | 1 ⁵ / ₈ | 2 | 2 ¹ / ₈ | 2 ¹ / ₈ | 2 ¹ / ₈ | 3 ¹ / ₈ | 3 ³ / ₈ | 3 ⁵ / ₈ | 3 ⁷ / ₈ | 4 ¹ / ₈ |
| T | 1/4* | 1/4* | 3/8 | 1/2 | 5/8 | 3/4 | 3/4 | 3/4 | 3/4 | 1 | 1 | 1 | 1 |
| W | 2 ¹ / ₂ | 2 ¹ / ₂ | 2 ¹ / ₂ | 3 | 4 | 5 | 5 | 6 | 6 | 8 | 8 | 8 | 9 |

* 3/8" for single rod suspension ** 3¹/₄" is furnished with 4 UNC series thread.

Fig. 81-H Type D

Model R



Type D may be bolted directly under steel. Sizes 1 to 9 are furnished with swivel eye and turnbuckle instead of yoke and coupling.

Notes: See load travel tables, page 196 through 199 for "B" dimension. For weights see page 215. Location of travel indicator and contour of side plate may vary from that shown.

FIG. 81-H TYPE D: DIMENSIONS (INCHES)

| Hanger Sizes | D | E | F | G | M | N | X | Y | Angle Size | Bracket Hole Dia. | Total Travel TT | L | C | Factors | J-Rod | | |
|--------------|---------------------------------|-------------------------------|-------------------------------|--------------------------------|----------------------------------|--------------------------------|-------------------------------|---------------------------------|---------------------|--------------------------------|---------------------------------------|----------------------------------|--------------------------------|----------------------------------|------------------------------------|----------|-------|
| | | | | | | | | | | | | | | | Min Thd Length | Rod Dia. | |
| | | | | | | | | | | | | | | | | Min | Max |
| 1 - 9 | 8 ³ / ₄ | 1 | 7 ¹ / ₈ | 2 | 6 ¹ / ₈ | 4 ¹ / ₈ | 3 ¹ / ₄ | 5 ⁵ / ₈ | 2 x 2 x 1/4 | 9 ¹ / ₁₆ | 4 or less | 16 ¹ / ₄ | 6 | 13 ³ / ₈ | 1 ³ / ₄ + TT | 1/2 | 1/2 |
| | | | | | | | | | | | 4 ¹ / ₂ or more | 20 ¹ / ₄ | 10 | 15 ¹⁵ / ₁₆ | | | |
| 10 - 18 | 8 ⁷ / ₁₆ | 3 ¹ / ₄ | 1/2 | 2 ⁹ / ₁₆ | 8 ⁵ / ₁₆ | 6 ⁷ / ₁₆ | 7 ⁷ / ₈ | 8 ¹ / ₁₆ | 1 1/2 x 1 1/2 x 1/4 | 3/4 | 5 or less | 18 ⁷ / ₁₆ | 3 1/2 | 11 ¹³ / ₁₆ | 1 ³ / ₄ + TT | 1/2 | 3/4 |
| | | | | | | | | | | | 5 1/2 or more | 21 ⁷ / ₁₆ | 6 | 14 ³ / ₁₆ | | | |
| 19 - 34 | 14 ⁷ / ₁₆ | 1 1/2 | 5/8 | 3 ⁵ / ₈ | 12 ⁷ / ₁₆ | 8 ⁹ / ₁₆ | 1 1/8 | 11 ⁵ / ₁₆ | 3 x 3 1/2 x 1/4 | 3/4 | 5 or less | 26 ¹⁵ / ₁₆ | 9 1/2 | 17 ³ / ₄ | 2 ³ / ₈ + TT | 1/2 | 1 1/4 |
| | | | | | | | | | | | 5 1/2 or more | 31 ¹ / ₁₆ | 13 ⁵ / ₈ | 19 ⁷ / ₈ | | | |
| 35 - 49 | 17 ¹ / ₁₆ | 2 | 1 1/16 | 4 1/2 | 13 ³ / ₄ | 9 ⁹ / ₁₆ | 1 3/8 | 13 | 3 x 4 x 3/8 | 7/8 | 6 or less | 31 ¹ / ₁₆ | 10 1/2 | 20 ¹³ / ₁₆ | 3 1/4 + TT | 1/2 | 1 3/4 |
| | | | | | | | | | | | 6 1/2 or more | 39 ⁹ / ₁₆ | 18 1/2 | 25 ¹ / ₁₆ | | | |
| 50 - 63 | 26 ³ / ₁₆ | 2 | 1 5/16 | 7 3/8 | 17 ¹¹ / ₁₆ | 11 1/4 | 1 5/8 | 14 ⁵ / ₈ | 4 x 4 x 3/8 | 1 3/8 | 8 or less | 45 ⁹ / ₁₆ | 15 ³ / ₈ | 27 ¹ / ₁₆ | 4 1/4 + TT | 3/4 | 2 1/4 |
| | | | | | | | | | | | 8 1/2 to 11 | 53 ³ / ₁₆ | 23 ³ / ₈ | 27 ¹ / ₁₆ | | | |
| | | | | | | | | | | | 11 or more | 53 ³ / ₁₆ | 23 ³ / ₈ | 32 ³ / ₈ | | | |
| 64 - 74 | 35 ³ / ₄ | 3 | 3 3/4 | 5 1/4 | 22 ³ / ₁₆ | 11 | 2 | 15 | 4 x 6 x 1/2 | 1 5/8 | 10 1/2 or less | 57 1/2 | 15 ³ / ₄ | 38 ³ / ₈ | 5 3/4 + TT | 1 1/4 | 2 3/4 |
| | | | | | | | | | | | 11 or more | 63 | 21 ¹ / ₄ | 38 ¹ / ₂ | | | |
| 75 - 83 | 35 ³ / ₄ | 3 | 3 3/8 | 4 3/4 | 27 ³ / ₁₆ | 11 | 2 | 15 | 4 x 6 x 1/2 | 1 5/8 | 10 1/2 or less | 57 1/2 | 15 ³ / ₄ | 41 ¹ / ₄ | 5 3/4 + TT | 1 1/2 | 3 1/4 |
| | | | | | | | | | | | 11 or more | 63 | 21 ¹ / ₄ | 41 ³ / ₈ | | | |
| 84 - 110 | Not available | | | | | | | | | | | | | | | | |

* Rod take-out = factor - (TT / 2), for lever in high position.

J-ROD SELECTION CHART

| Load (lbs) | 0 800 | 801 1,500 | 1,501 2,540 | 2,541 4,000 | 4,001 6,100 | 6,101 9,400 | 9,401 13,400 | 13,401 18,300 | 18,301 24,700 | 24,701 31,000 | 31,001 39,000 | 39,001 48,000 | 48,001 58,000 |
|------------|----------|--------------|----------------|----------------|----------------|----------------|-----------------|------------------|------------------|------------------|------------------|------------------|------------------|
| J Rod Size | 1/2 | 5/8 | 3/4 | 1 | 1 1/4 | 1 1/2 | 1 3/4 | 2 | 2 1/4 | 2 1/2 | 2 3/4 | 3 | 3 1/4* |

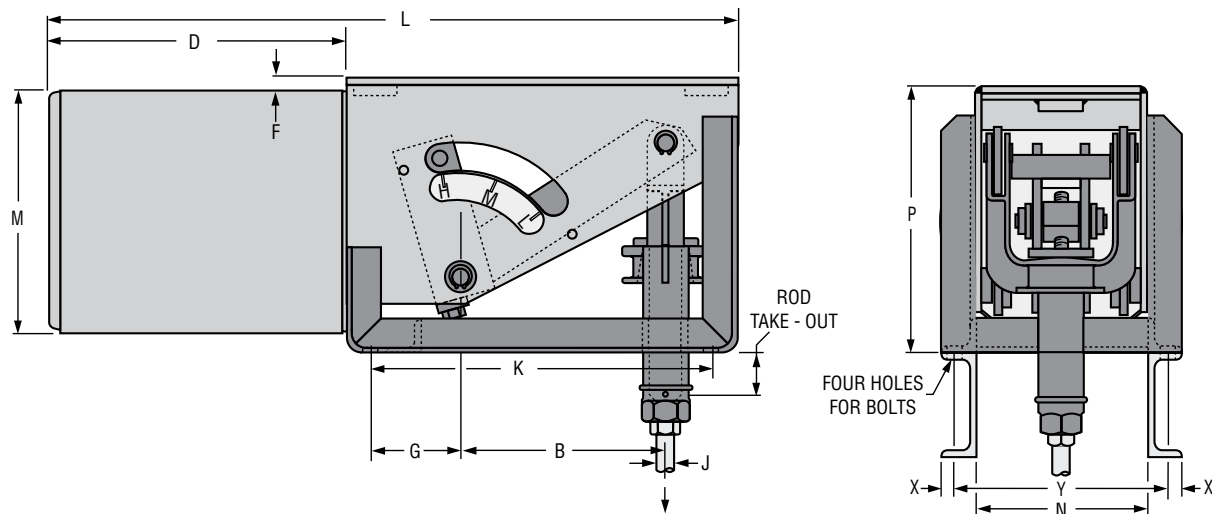
*3 1/4" is furnished with 4 UNC series thread.



CONSTANT SUPPORTS

Fig. 81-H Type E

Model R



Type E incorporates two brackets as part of its frame, permitting the bolting of the constant support to the top of structural steel. Sizes 1 to 9 are furnished with swivel eye and turnbuckle instead of yoke and coupling. If rod take-out does not exceed the depth of the supporting steel and rod coupling is required to extend below the steel,

specify the depth of the supporting steel. Increase rod take-out by the depth of the steel.

Notes: See load travel tables, page 196 through 199 for "B" dimension. For weights see page 215. Location of travel indicator and contour of side plate may vary from that shown.

FIG. 81-H TYPE E: DIMENSIONS (IN)

| Hanger Sizes | D | F | G | M | N | P | X | Y | Angle Size | Bkt. Hole Dia. | Total Travel TT | L | K | Factors | J-Rod | | |
|--------------|---------------------------------|--------------------------------|--------------------------------|---------------------------------|---------------------------------|---------------------------------|--------------------------------|----------------------------------|---|--------------------------------|--|----------------------------------|--------------------------------|--------------------------------|------------------------------------|-------------------------------|-------------------------------|
| | | | | | | | | | | | | | | | Min Thd Length | Rod Dia. | |
| | | | | | | | | | | | | | | | | Min | Max |
| 1 - 9 | 8 ³ / ₄ | 1 ¹ / ₄ | 2 | 6 ¹ / ₈ | 4 ¹ / ₈ | 8 ¹ / ₂ | 5 ⁵ / ₈ | 5 ¹⁵ / ₁₆ | 1 ¹ / ₂ x 1 ¹ / ₂ x 1 ¹ / ₄ | 9 ¹ / ₁₆ | 4 or less | 16 ¹ / ₄ | 6 | 5 ¹ / ₈ | 1 ³ / ₄ + TT | 1 ¹ / ₂ | 1 ¹ / ₂ |
| | | | | | | | | | | | 4 ¹ / ₂ or more | 20 ¹ / ₄ | 10 | 7 ¹ / ₁₆ | | | |
| 10 - 18 | 8 ⁷ / ₁₆ | 1 | 2 ¹ / ₁₆ | 8 ⁵ / ₁₆ | 6 ⁷ / ₁₆ | 11 ⁷ / ₁₆ | 5 ⁵ / ₈ | 8 ¹⁵ / ₁₆ | 1 ¹ / ₂ x 2 x 1 ¹ / ₄ | 3 ³ / ₄ | 5 or less | 18 ⁷ / ₁₆ | 7 ¹ / ₂ | 1 ³ / ₄ | 1 ³ / ₄ + TT | 1 ¹ / ₂ | 3 ³ / ₄ |
| | | | | | | | | | | | 5 ¹ / ₂ or more | 21 ⁷ / ₁₆ | 7 ¹ / ₂ | 4 ¹ / ₁₆ | | | |
| 19 - 34 | 14 ⁷ / ₁₆ | 5 ⁵ / ₈ | 3 ⁵ / ₈ | 12 ⁷ / ₁₆ | 8 ⁹ / ₁₆ | 15 ⁵ / ₈ | 5 ⁵ / ₈ | 11 ³ / ₁₆ | 1 ¹ / ₂ x 2 ¹ / ₂ x 1 ¹ / ₄ | 3 ³ / ₄ | 5 or less | 26 ¹⁵ / ₁₆ | 10 | 3 ³ / ₈ | 2 ³ / ₈ + TT | 1 ¹ / ₂ | 1 ¹ / ₄ |
| | | | | | | | | | | | 5 ¹ / ₂ or more | 31 ¹ / ₁₆ | 10 | 5 ¹ / ₂ | | | |
| 35 - 49 | 17 ¹ / ₁₆ | 1 ¹ / ₁₆ | 4 ¹ / ₂ | 13 ³ / ₄ | 9 ¹³ / ₁₆ | 19 ⁵ / ₈ | 1 ³ / ₁₆ | 13 ⁵ / ₁₆ | 3 x 2 x 3 ³ / ₈ | 7 ⁵ / ₈ | 6 or less | 31 ¹ / ₁₆ | 11 ⁵ / ₈ | 4 ⁷ / ₈ | 3 ¹ / ₄ + TT | 1 ¹ / ₂ | 1 ³ / ₄ |
| | | | | | | | | | | | 6 ¹ / ₂ or more | 39 ⁹ / ₁₆ | 11 ⁵ / ₈ | 9 ¹ / ₂ | | | |
| 50 - 63 | 26 ³ / ₁₆ | 1 ⁵ / ₁₆ | 7 ⁵ / ₈ | 17 ¹ / ₁₆ | 11 ¹ / ₄ | 19 ³ / ₄ | 1 ⁵ / ₁₆ | 14 ¹ / ₁₆ | 3 x 3 x 3 ³ / ₈ | 1 ³ / ₈ | 8 or less | 45 ⁹ / ₁₆ | 15 ⁵ / ₈ | 6 ⁷ / ₈ | 4 ¹ / ₄ + TT | 3 ³ / ₄ | 2 ¹ / ₄ |
| | | | | | | | | | | | 8 ¹ / ₂ to 11 | 53 ⁹ / ₁₆ | 23 ³ / ₈ | 6 ⁷ / ₈ | | | |
| | | | | | | | | | | | 11 ¹ / ₂ or more | 53 ⁹ / ₁₆ | 23 ³ / ₈ | 12 ¹ / ₄ | | | |
| 64 - 74 | 35 ³ / ₄ | 3 ³ / ₄ | 5 ¹ / ₄ | 22 ³ / ₁₆ | 11 | 26 ⁷ / ₈ | 1 ⁹ / ₁₆ | 14 ¹⁵ / ₁₆ | 3 ¹ / ₂ x 3 ¹ / ₂ x 1 ¹ / ₂ | 1 ⁵ / ₈ | 10 ¹ / ₂ or less | 57 ¹ / ₂ | 17 ¹ / ₂ | 11 ¹ / ₈ | 5 ³ / ₄ + TT | 1 ¹ / ₄ | 2 ¹ / ₄ |
| | | | | | | | | | | | 11 or more | 63 | 23 | 11 ¹ / ₄ | | | |
| 75 - 83 | 35 ³ / ₄ | 3 ⁵ / ₈ | 4 ³ / ₄ | 27 ³ / ₁₆ | 11 | 31 ⁷ / ₈ | 1 ⁹ / ₁₆ | 14 ¹⁵ / ₁₆ | 3 ¹ / ₂ x 3 ¹ / ₂ x 1 ¹ / ₂ | 1 ⁵ / ₈ | 10 ¹ / ₂ or less | 57 ¹ / ₂ | 17 ¹ / ₂ | 9 | 5 ³ / ₄ + TT | 1 ¹ / ₂ | 3 ³ / ₄ |
| | | | | | | | | | | | 11 or more | 63 | 23 | 9 ¹ / ₈ | | | |
| 84 - 110 | Refer to page 214 | | | | | | | | | | | | | | | | |

* Rod take-out = (factor) - (TT / 2), for lever in high position.

J-ROD SELECTION CHART

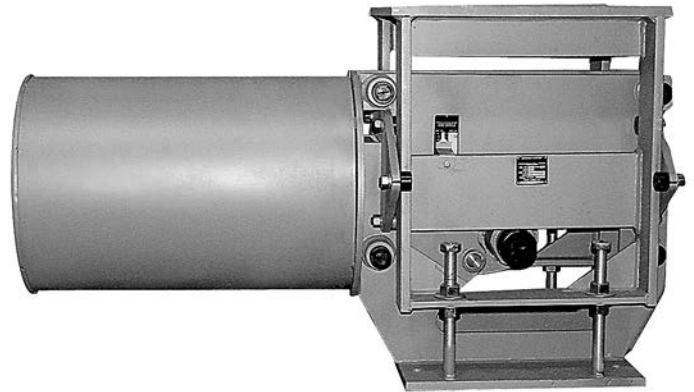
| Load (lbs) | 0 800 | 801 1,500 | 1,501 2,540 | 2,541 4,000 | 4,001 6,100 | 6,101 9,400 | 9,401 13,400 | 13,401 18,300 | 18,301 24,700 | 24,701 31,000 | 31,001 39,000 | 39,001 48,000 | 48,001 58,000 |
|------------|----------|--------------|----------------|----------------|----------------|----------------|-----------------|------------------|------------------|------------------|------------------|------------------|------------------|
| J Rod Size | 1/2 | 5/8 | 3/4 | 1 | 1 1/4 | 1 1/2 | 1 3/4 | 2 | 2 1/4 | 2 1/2 | 2 3/4 | 3 | 3 1/4* |

*3/4" is furnished with 4 UNC series thread.

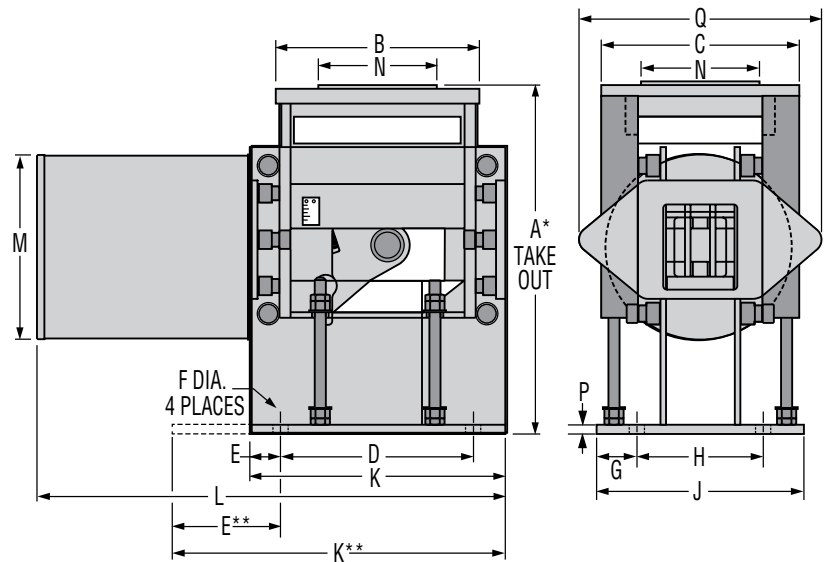
Fig. 81-H Type F Upthrust

Model R

The Upthrust is for support of piping or equipment from below. It has a base flange for fastening to the floor or beams. The load is supported during hydrostatic testing by means of (4) positioning studs. After testing the nuts are moved to either end of the stud to prevent interference during operation. The Upthrust constant support is available for loads up to 24,463 (lbs). Corrosion resistant units are available either galvanized or carbon-zinc painted.



| TAKE-OUT FACTOR* "A" | | | | | |
|----------------------|---------|---------|---------|---------|---------|
| T.T. | Sizes | | | | |
| | 10 - 18 | 19 - 34 | 35 - 49 | 50 - 63 | 64 - 74 |
| 2.0 | 16 1/8 | 23 1/8 | - | - | - |
| 2.5 | | | - | - | - |
| 3.0 | | | - | - | - |
| 3.5 | | | - | - | - |
| 4.0 | 19 7/8 | 25 3/4 | 28 1/2 | 43 1/4 | - |
| 4.5 | | | | | - |
| 5.0 | | | | | - |
| 5.5 | | | | | - |
| 6.0 | 27 1/2 | 31 5/8 | 34 | - | - |
| 6.5 | | | | - | |
| 7.0 | | | | - | |
| 7.5 | | | | - | |
| 8.0 | - | - | - | - | - |
| 8.5 | - | - | - | - | - |
| 9.0 | - | - | - | - | - |
| 9.5 | - | - | - | - | - |
| 10.0 | - | - | - | - | - |



Notes: * Shorter "A" Dimensions are available upon request.
 ** For sizes 64 - 74 only.

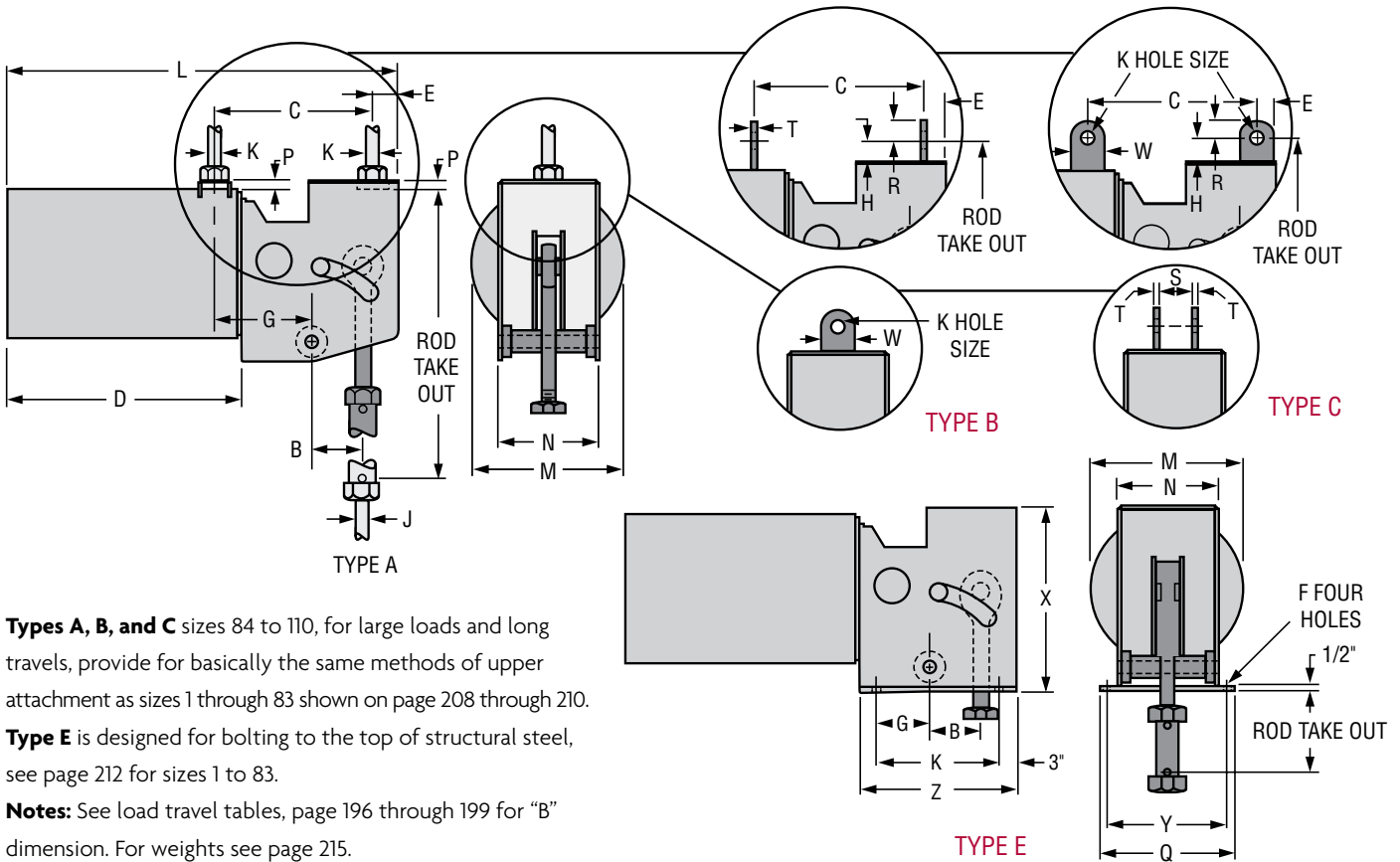
* For down travel: Take-Out = "A" + (1/2) Actual Travel
 For up travel: Take-Out = "A" - (1/2) Actual Travel

| FIG. 81-H TYPE F: DIMENSIONS (IN) | | | | | | | | | | | | | | | | |
|-----------------------------------|-----------------|--------------|--------|--------|--------|----------|------------|--------|--------|---------|--------|---------|--------|----|--------|--------|
| Size | Total Travel TT | A | B | C | D | E | F | G | H | J | K | L | M | N | P | Q |
| 10 - 18 | 2 - 6 | See Take Out | 10 7/8 | 11 7/8 | 9 | 2 1/2 | 3/4 | 2 | 8 | 12 | 14 | 22 7/16 | 8 1/4 | 5 | 1/2 | 13 7/8 |
| 19 - 34 | 2 - 8 | | 13 3/4 | 13 3/4 | 13 | 2 1/8 | | | 10 | 14 | 17 1/4 | 31 5/8 | 12 1/2 | 8 | 5/8 | 16 5/8 |
| 35 - 49 | 2 1/2 - 10 | | 17 7/8 | 16 1/4 | 17 | 2 | 7/8 | | 13 | 17 | 21 | 38 1/4 | 13 5/8 | | 19 3/4 | |
| 50 - 63 | 3 - 10 | | 21 5/8 | 19 1/4 | 16 1/2 | 4 5/8 | 3 5/8 | 11 3/4 | 19 | 22 7/16 | 52 | 17 3/8 | 23 1/4 | | | |
| 64 - 74 | 4 - 10 | | 30 | 25 5/8 | 22 5/8 | 16 15/16 | 1 1/8 Slot | 4 7/16 | 22 5/8 | 31 | 43 3/4 | 65 1/2 | 22 | 10 | 3/4 | 28 |

CONSTANT SUPPORTS

Fig. 81-H, Types A, B, C and E

Model R, Sizes 84 to 110



Types A, B, and C sizes 84 to 110, for large loads and long travels, provide for basically the same methods of upper attachment as sizes 1 through 83 shown on page 208 through 210.

Type E is designed for bolting to the top of structural steel, see page 212 for sizes 1 to 83.

Notes: See load travel tables, page 196 through 199 for "B" dimension. For weights see page 215.

| FIG. 81-H, TYPES A, B, C AND E: DIMENSIONS (IN) | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--------------------------------|----------|--------------------------------|--------------------------------|----------|-------------------------------|-------------------------------|--------------------------------|-------------------------------|---|----|----|--------------------------------|-------------------------------|----|----|--------------------------------|----|--|--------------------------------|--------------------------------|--------------------------------|--------------|-------------------------------|-------------------------------|
| Hanger Size | L | C | | D | E | | F | G | | H | K | M | N | P | Q | X | Y | Z | Total Travel TT | Factors | | | J-Rod | | |
| | | Type A&B | Type C | | Type A&B | Type C | | Type A&B & C | Type E | | | | | | | | | | | Type A | Type B&C | Type E | Min Thd Lgth | Rod Dia. | |
| | | Min | Max | | Min | Max | | | | | | | | | | | | | | | | | | | |
| 84-94 | 76 ³ / ₄ | 28 | 27 ¹ / ₂ | 49 ³ / ₄ | 4 | 4 ¹ / ₂ | 1 ¹ / ₈ | 14 | 6 | 6 | 21 | 24 | 10 ¹ / ₂ | 3 | 16 | 34 | 13 | 27 | 9 ¹ / ₂ or less | 45 ³ / ₄ | 54 ³ / ₄ | 21 ¹ / ₈ | 10 | 2 | 3 ³ / ₄ |
| | | | | | | | | | | | | | | | | | | | 10 or more | 55 ¹ / ₂ | 64 ¹ / ₂ | 31 ³ / ₈ | 13 | | |
| 95-110 | 100 | 49 | 48 ¹ / ₂ | 64 | 4 | 4 ¹ / ₂ | 1 ³ / ₈ | 28 ³ / ₄ | 8 ³ / ₄ | 6 | 30 | 24 | 11 ¹ / ₂ | 3 ¹ / ₂ | 17 | 37 | 14 ¹ / ₂ | 36 | 14 or less | 56 ¹ / ₂ | 66 | 17 ⁵ / ₈ | 12 | 2 ¹ / ₂ | 3 ³ / ₄ |
| | | | | | | | | | | | | | | | | | | | 14 ¹ / ₂ or more | 65 ³ / ₄ | 74 ³ / ₄ | 26 ⁵ / ₈ | 15 | | |

* Rod take-out = (factor) - (0.75 x TT), for lever in high position.

| Load (lbs) | 14,376 18,300 | 18,301 24,700 | 24,701 31,000 | 31,001 39,000 | 39,001 48,000 | 48,001 58,000 | 58,001 69,000 | 69,001 87,500 |
|------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|---------------------------------|---------------------------------|---------------------------------|
| J & K-Rods | 2 | 2 ¹ / ₄ | 2 ¹ / ₂ | 2 ³ / ₄ | 3 | 3 ¹ / ₄ * | 3 ¹ / ₂ * | 3 ³ / ₄ * |
| K-Hole | 2 ³ / ₈ | 2 ⁵ / ₈ | 2 ⁷ / ₈ | 3 ¹ / ₈ | 3 ³ / ₈ | 3 ⁵ / ₈ | 3 ⁷ / ₈ | 4 ¹ / ₈ |
| R | 3 | 3 | 4 | 4 | 4 | 4 ¹ / ₂ | 4 ¹ / ₂ | 4 ¹ / ₂ |
| S | 2 ⁷ / ₈ | 3 ¹ / ₈ | 3 ³ / ₈ | 3 ⁵ / ₈ | 3 ⁷ / ₈ | 4 ¹ / ₈ | 4 ³ / ₈ | 4 ⁵ / ₈ |
| T (Type B) | 3/4 | 3/4 | 1 | 1 | 1 | 1 | 1 ¹ / ₂ | 1 ³ / ₄ |
| T (Type C) | | | | | | | 1 ¹ / ₄ | 1 ¹ / ₄ |
| W | 6 | 6 | 8 | 8 | 8 | 9 | 9 | 9 |

*3³/₄ and larger is furnished with 4 UNC series thread.

Fig. 80-V and 81-H

Weight Chart (approx) lbs, each

| Hanger Sizes | Fig 80-V | | | Fig 81-H | | | |
|--------------|----------------------|----------|----------|----------------------|----------|--------|----------|
| | Types A, B, C, D & E | | Type G ■ | Types A, B, C, D & E | | Type F | |
| | Net | Shipping | Net | Net | Shipping | Net | Shipping |
| 1 to 3 | – | – | – | 18 | 20 | – | – |
| 4 to 6 | – | – | – | 21 | 23 | – | – |
| 7 to 9 | – | – | – | 23 | 25 | – | – |
| 10 to 12 | 62 | 67 | 160 | 52 | 57 | 174 | 179 |
| 13 to 15 | 65 | 70 | 166 | 55 | 60 | 177 | 182 |
| 16 to 18 | 70 | 75 | 176 | 60 | 65 | 182 | 187 |
| 19 to 20 | 163 | 171 | 371 | 150 | 158 | 415 | 423 |
| 21 to 23 | 165 | 173 | 375 | 152 | 160 | 417 | 425 |
| 24 to 26 | 172 | 180 | 389 | 159 | 167 | 424 | 432 |
| 27 to 29 | 180 | 188 | 405 | 167 | 175 | 432 | 440 |
| 30 to 32 | 187 | 195 | 419 | 174 | 182 | 439 | 447 |
| 33 to 34 | 195 | 203 | 435 | 182 | 190 | 447 | 455 |
| 35 to 37 | 300 | 312 | 676 | 280 | 292 | 640 | 652 |
| 38 to 40 | 315 | 327 | 706 | 295 | 307 | 655 | 667 |
| 41 to 43 | 332 | 344 | 740 | 312 | 324 | 672 | 684 |
| 44 to 46 | 343 | 355 | 762 | 323 | 335 | 683 | 695 |
| 47 to 49 | 360 | 372 | 796 | 340 | 352 | 700 | 712 |
| 50 to 51 | 601 | 661 | 1,278 | 511 | 571 | 1,181 | 1,241 |
| 52 to 54 | 626 | 686 | 1,328 | 536 | 596 | 1,206 | 1,266 |
| 55 to 57 | 665 | 725 | 1,406 | 575 | 635 | 1,245 | 1,305 |
| 58 to 60 | 706 | 766 | 1,488 | 616 | 676 | 1,286 | 1,346 |
| 61 to 63 | 745 | 805 | 1,566 | 655 | 715 | 1,325 | 1,385 |
| 64 to 65 | 1,468 | 1,568 | – | 1,225 | 1,325 | – | – |
| 66 to 68 | 1,568 | 1,668 | – | 1,325 | 1,425 | – | – |
| 69 to 71 | 1,653 | 1,753 | – | 1,410 | 1,510 | – | – |
| 72 to 74 | 1,753 | 1,853 | – | 1,520 | 1,620 | – | – |
| 75 to 77 | 2,360 | 2,460 | – | 1,970 | 2,070 | – | – |
| 78 to 80 | 2,430 | 2,530 | – | 2,020 | 2,120 | – | – |
| 81 to 83 | 2,570 | 2,670 | – | 2,180 | 2,280 | – | – |
| 84 to 85 | 2,725 | 2,845 | – | 2,310 | 2,430 | – | – |
| 86 to 88 | 2,870 | 2,990 | – | 2,455 | 2,575 | – | – |
| 89 to 90 | 3,070 | 3,190 | – | 2,655 | 2,775 | – | – |
| 91 to 92 | 3,155 | 3,275 | – | 2,740 | 2,860 | – | – |
| 93 to 94 | 3,255 | 3,375 | – | 2,840 | 2,960 | – | – |
| 95 to 98 | 4,350 | 4,500 | – | 3,925 | 4,075 | – | – |
| 99 to 102 | 4,675 | 4,825 | – | 4,250 | 4,400 | – | – |
| 103 to 106 | 5,300 | 5,450 | – | 4,875 | 5,025 | – | – |
| 107 to 110 | 5,800 | 5,950 | – | 5,350 | 5,500 | – | – |

■ Based on 3'-0" C - C rod dimension and 8" total travel

CONSTANT SUPPORTS

Constant Support

Check List for Requesting a Quote or Ordering

Page ___ of ___



Anvil International
Precision Park
160 Frenchtown Rd.
North Kingstown, RI 02852

For technical information regarding
Constant Supports Call or Email:
Phone Number: (401) 886-3020
Email: eps_contact@anvilintl.com

Finish: Standard Primer: _____ Galvanized: _____ Special Coating: _____

Quantity: _____

Figure No.: Options are: 80-V, 81-H
or: C-80-V, C-81-H

Size: Options are: #1 through #110 (Size #1 through #9 available in 81-H only) _____

Type: Options are: A through G* (Type F Upthrust available in 81-H only, Type G available in 80-V only) _____

Actual Travel (AT): _____ (inches)

Total Travel (TT):** _____ (inches)

Direction of Travel: _____ + (up) or – (down)

Load: _____ (lbs)

“J” Dimension (rod diameter): _____ (inches) (Not required for Type F)

Mark Number: _____ (If required)

Travel Stops: Are always Included

Lifting Lugs: Yes: _____ No: _____

Available on sizes 10 and larger.

Notes:

* Type G Constants must also include the C-to-C dimension & the load per spring.

** Total Travel = Actual travel + 1” or 20% whichever is greater rounded up to the next one half inch increment.

Fig. 296

Sway Brace

Fig. 301: with Adjustable Preload

Fig. C-296, Fig. C-301: Corrosion Resistant

Size Range: Preloads from 50 to 1,800 pounds and maximum forces from 200 to 7,200 pounds.

Finish: Standard finish: painted with semi gloss primer. Corrosion resistant: galvanized with coated coil.

Service: Recommended for controlling vibration; absorbing shock loading; guiding or restraining the movement of pipe resulting from thermal expansion; bracing a pipe line against sway.

Approvals: Complies with Federal Specification A-A-1192A (Type 55) WW-H-171E (Type 55), ANSI/MSS SP-69 and MSS SP-58 (Type 50).

Installation: Shipped ready for installation (see line cuts of Fig. 297, Fig. 298, Fig. 302 and Fig. 303 on page 219 for typical installed hanger assemblies).

Adjustment: The sway brace should be in the neutral position when the system is hot and operating, at which time both spring plates should be in contact with the end plates. If they are not, the sway brace should be adjusted to the neutral position by use of the load coupling.

Features:

- Vibration is dampened with an instantaneous opposing force bringing the pipe back to normal position.
- A single pre-loaded spring provides two way movement.
- One spring saves space and simplifies design.
- Spring has 3-inch travel in either direction.
- Accurate neutral adjustment assured.
- A tight fitting connection at rear bracket and clamp.

Additional Features – Fig. 301:

The Fig. 301 sway brace is adjustable from the initial preload to the maximum capacity of the unit selected. It is equipped with a load-deflection scale to facilitate preload adjustment. Preload adjustment reduces spring travel accordingly.

Ordering: Specify figure, name and sway brace size. The Anvil Fig. 296 and Fig. 301 consist of the sway brace only. Available corrosion resistant as Fig. C-296 and Fig. C-301.

Preload adjustment – Fig. 301: Turn the preload adjustment nut until desired preload is indicated. Turn thrust nut until it is in contact with the spring plate. Lock in position. Indicated deflection must be greater than thermal movement.

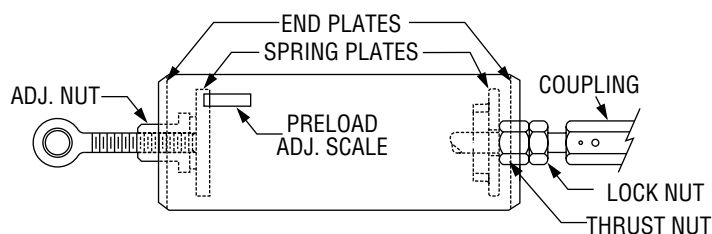


Fig. 296, Fig. 301: with Adjustable Preload

Sway Brace (cont.)

Fig. C-296, Fig. C-301: Corrosion Resistant

Size selection: The Anvil Vibration Control and Sway Brace gives full deflection forces from 200 to 7,200 pounds and has initial precompressed spring forces from 50 to 1,800 pounds to control vibrations and pipe sway. The amount of force needed to control piping should be in proportion to the mass, amplitude of movement, and nature of disturbing forces acting on the pipe. When it is possible to calculate the exact restraining force required, the size of the Vibration Control and Sway Brace capable of providing this force should be selected. As a general reference, the following sizes have been historically used for the pipe sizes shown:

- #1 - 3 1/2" and smaller
- #2 - 4" to 8"
- #3 - 10" to 16"
- #4 - 18" to 24"
- #5 and #6 - above 24"

Installation: 1) attach rear bracket to structure and pipe attachment to piping or equipment. 2) connect coupling to pipe attachment and turn coupling so that spring is compressed in direction opposite to and by approximate amount of piping thermal movement.

Important: Final adjustment should be made with the pipe in its hot or operating position. Turn the coupling until both spring plates are in contact with the end plates of the Sway Brace. When correct tension adjustments are completed, the brace exerts no force on the pipe in its operating position. Under shutdown conditions, the brace allows the pipe to assume its cold position. It exerts a nominal cold strain force equal to the preload force plus the amount of travel from the hot to cold position, times the spring scale of the particular size of the Vibration Control and Sway Brace.

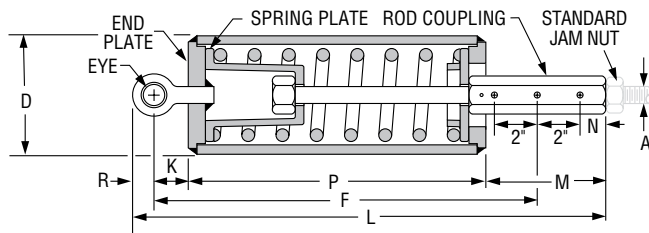


Fig. 296

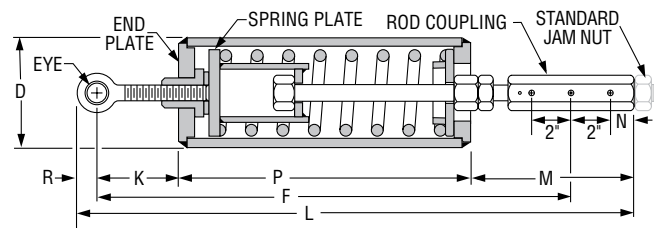


Fig. 301

FIG. 296: DIMENSIONS (IN) • LOADS • WEIGHTS (LBS)

| Sway Brace Size | Pipe Size | Preload and Spring Scale (lb/in) | Max Force (lbs) | Weight | Rod Size Fig. 297 A | Eye | | D | Length F | K | L | M | N | P | R |
|-----------------|-------------|----------------------------------|-----------------|--------|---------------------|-----------|-----------|--------|----------|----------|---------|-------|--------|---------|----------|
| | | | | | | Dia. Hole | Thickness | | | | | | | | |
| 1 | 1 1/2 to 24 | 50 | 200 | 22 | 3/4 | 1 | 1 | 4 1/2 | 13 5/8 | 1 5/8 | 17 7/8 | 6 1/2 | 1 | 8 7/8 | 1 1/4 |
| 2 | | 150 | 600 | 25 | 1 | | | | 14 3/8 | | 18 3/8 | | | 9 5/8 | |
| 3 | | 450 | 1,800 | 36 | 1 | | | | 17 3/4 | | 22 | | | 13 | |
| 4 | | 900 | 3,600 | 64 | 1 1/4 | | | | 17 | | 22 5/16 | | | 11 1/2 | |
| 5 | 6 to 30 | 1,350 | 5,400 | 79 | 1 1/2 | 1 1/2 | 6 5/8 | 18 1/2 | 2 1/4 | 23 13/16 | 6 3/4 | 1 1/2 | 13 | 1 13/16 | |
| 6 | | 1,800 | 7,200 | 95 | | | | 1 1/2 | | | | | 20 1/2 | | 25 13/16 |

FIG. 301: DIMENSIONS (IN) • LOADS • WEIGHTS (LBS)

| Sway Brace Size | Pipe Size | Preload and Spring Scale (lb/in) | Max Force (lbs) | Weight | Rod Size Fig. 302 A | Eye | | D | Length F | K | L | M | N | P | R |
|-----------------|-------------|----------------------------------|-----------------|--------|---------------------|-----------|-----------|----------|----------|---------|--------|-------|----------|---------|--------|
| | | | | | | Dia. Hole | Thickness | | | | | | | | |
| 1 | 1 1/2 to 24 | 50 | 200 | 23 | 3/4 | 1 | 3/4 | 4 1/2 | 20 | 5 15/16 | 24 1/4 | 7 7/8 | 1 | 9 3/16 | 1 1/4 |
| 2 | | 150 | 600 | 26 | 1 | | | | 20 3/4 | | 25 | | | 9 9/16 | |
| 3 | | 450 | 1,800 | 38 | 1 | | | | 24 1/8 | | 28 3/8 | | | 13 5/16 | |
| 4 | | 900 | 3,600 | 67 | 1 1/4 | | | | 24 5/16 | | 29 5/8 | | | 12 | |
| 5 | 6 to 30 | 1,350 | 5,400 | 82 | 1 1/2 | 1 1/2 | 6 5/8 | 25 13/16 | 6 9/16 | 31 1/8 | 9 1/4 | 1 1/2 | 13 1/2 | 1 13/16 | |
| 6 | | 1,800 | 7,200 | 98 | | | | 1 1/2 | | | | | 27 13/16 | | 33 1/8 |

Fig. 297 and Fig. 298

Sway Brace Assembly

Fig. 302 and Fig. 303: with Adjustable Preload

Fig. C-297, Fig. C-298, Fig. C-302

and Fig. C-303: Corrosion Resistant

The Fig. 297 and Fig. 302 consist of a structural attachment, two studs, the Sway Brace, extension piece up to 2' 0" in length as required, and a modified Fig. 295 pipe clamp.

The Fig. 298 and Fig. 303 consist of a structural attachment, two studs, the Sway Brace, adjustable extension piece 2' 1" in length or over as required, an adapter and a toleranced pipe clamp.

Note: In specifying Sway Brace assemblies where the "W" dimension exceeds 2' 0" in length, the Fig. 298 or Fig. 303 assembly is required. Verify that calculated "W" is within the min/max shown in table.

Ordering assemblies: Specify figure number, name, Sway Brace size, pipe size, "W" dimension. Available corrosion resistant as Fig. C-297, C-298, C-302 and C-303.

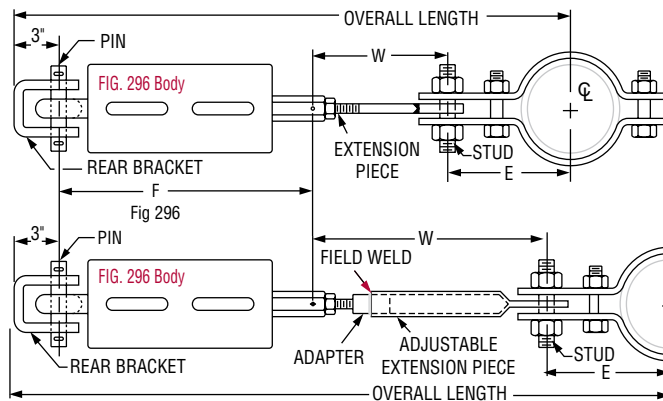


FIG. 297

FIG. 298

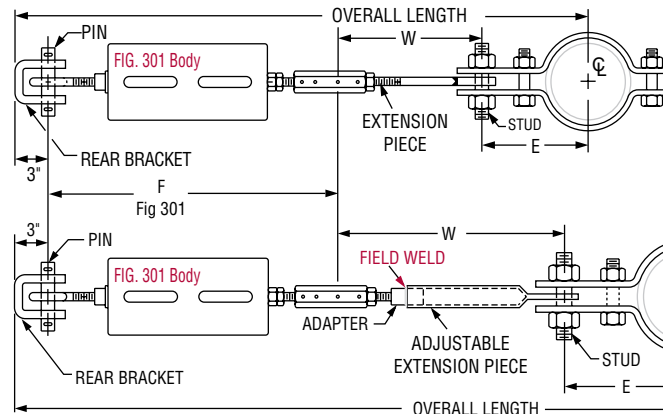


FIG. 302

FIG. 303

FIG. 297, 298, 302, 303, C-297, C-298, C-302 AND C-303: DIMENSIONS (IN)

| Pipe Size | E | | |
|-----------|---------------------------------|---------------------------------|---------------------------------|
| | Size 1 - 4 Carbon | Size 5 & 6 Carbon | Size 5 & 6 Alloy |
| 1½ | 4⅞ | — | — |
| 2 | 5⅞ | — | — |
| 2½ | 5¾ | — | — |
| 3 | 5 ¹⁵ / ₁₆ | — | — |
| 3½ | 6 ³ / ₁₆ | — | — |
| 4 | 6½ | — | — |
| 5 | 7 | — | — |
| 6 | 8 ⁸ / ₁₆ | 11 ⁷ / ₁₆ | 12 ¹ / ₁₆ |
| 8 | 9 ⁹ / ₁₆ | 12 ⁷ / ₁₆ | 13 ¹ / ₁₆ |
| 10 | 10 ⁵ / ₈ | 13½ | 14 ³ / ₈ |
| 12 | 11 ⁵ / ₈ | 14¾ | 15 ⁵ / ₈ |
| 14 | 12 ¹ / ₁₆ | 15¾ | 16 |
| 16 | 13 ¹ / ₁₆ | 16¾ | 17 |
| 18 | 14 ¹ / ₁₆ | 17¾ | 18 |
| 20 | 15 ⁵ / ₈ | 19 | 19½ |
| 24 | 17 ⁵ / ₈ | 21 ⁵ / ₈ | 22 ¹ / ₈ |
| 30 | — | 25 ¹ / ₈ | 25 ¹ / ₈ |
| | — | | |

FIG. 297, 298, 302, 303, C-297, C-298, C-302 AND C-303: DIMENSIONS (IN)

| Sway Brace Size | W | | | |
|-----------------|---------------------------------|-----|--------------------------------|----------------------------------|
| | Fig. 297, 302 | | Fig. 298, 303 | |
| | Min | Max | Min | Max |
| 1 | 7 ¹⁵ / ₁₆ | 24 | 24 | 90 ³ / ₁₆ |
| 2 | 8 ⁹ / ₁₆ | 24 | 24 | 86 ¹¹ / ₁₆ |
| 3 | 8 ⁹ / ₁₆ | 24 | 24 | 79 ³ / ₁₆ |
| 4 | 9 ¹ / ₁₆ | 24 | 24 | 74 ¹³ / ₁₆ |
| 5 | 9 ¹³ / ₁₆ | 24 | 24 ⁷ / ₈ | 92 |
| 6 | | | 24 | 90 |

SWAY STRUT ASSEMBLY

Fig. 211, Fig. C-211

Fig. 640, Fig. C-640: Field Welded Strut

Sway Strut Assembly

Finish: Painted (Fig. 211 & Fig. 640)

or Galvanized (Fig. C-211 & C-640)

Service: Used to restrain movement of piping while allowing for movement in the other two directions.

How to size:

- (1) Select size consistent with max. load to be restrained.
- (2) C to C is obtained by subtracting E and A from the distance from structural steel to center of pipe. Verify that the calculated C to C is within the min/max limits.
- (3) Determine W dimension by: $W=(C \text{ to } C)-2F$.

Installation: Shipped assembled. Securely fasten bracket to structure, make necessary adjustment in overall length, and fasten clamp to pipe.

Features:

- Effective under either tensile or compressive force.
- Provides 3 1/2" (Fig. 211) or 2" (Fig. 640) of field adjustment in either direction.
- Self-aligning bushings permits $\pm 5^\circ$ misalignment or angular motion. Bushings are coated with a dry lubricant.

Ordering: Specify figure number, assembly size, name, option number, normal pipe size or special O.D., and "W" dimension. Please specify temperature for pipe clamp. For restraint parallel to the pipe axis using two sway strut assemblies, a riser clamp is available. If a riser clamp is required, consult the nearest Anvil representative for information about this clamp.

Note: The rear bracket assembly can be ordered separately.



Note: Second lock nut available by special request only.

| E-TAKE OUT: DIMENSIONS (IN) | | | | | | | | | | | | | | | | | | | | | | |
|-------------------------------------|---------|--------|--------|--------|--------|--------|--------|--------|--------|-----------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----|---|
| E-Take Out: Dimensions 650°F (Max.) | | | | | | | | | | E Dimensions 1075°F* (Max.) | | | | | | | | | | | | |
| Pipe Size** | Sizes | | | | | | | | | Sizes | | | | | | | | | | | | |
| | A | B & C | 1 & 2 | 3 | 4 | 5 | 6 | 7 | 8 | A | B | C | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | |
| 3/4 | 2 7/16 | - | - | - | - | - | - | - | - | 8 | - | - | - | - | - | - | - | - | - | - | | |
| 1 | 2 9/16 | - | - | - | - | - | - | - | - | 8 1/8 | - | - | - | - | - | - | - | - | - | - | | |
| 1 1/4 | 2 11/16 | - | - | - | - | - | - | - | - | 8 1/4 | - | - | - | - | - | - | - | - | - | - | | |
| 1 1/2 | 4 1/8 | - | - | - | - | - | - | - | - | 8 3/8 | - | - | - | - | - | - | - | - | - | - | | |
| 2 | 5 1/8 | 6 3/8 | 6 3/8 | - | - | - | - | - | - | 8 5/8 | 9 3/8 | 9 3/8 | 9 3/8 | 9 3/8 | - | - | - | - | - | - | | |
| 2 1/2 | 5 3/8 | 7 | 7 | 8 3/8 | - | - | - | - | - | 8 7/8 | 9 3/8 | 9 3/8 | 9 3/8 | 9 3/8 | - | - | - | - | - | - | | |
| 3 | 5 15/16 | | | | - | - | - | - | - | - | - | 9 1/8 | 9 3/8 | 9 3/8 | 9 3/8 | 9 3/8 | - | - | - | - | - | - |
| 3 1/2 | 6 3/16 | 10 | 10 | 10 | - | - | - | - | - | 9 3/8 | 9 3/8 | 9 3/8 | 9 3/8 | 9 3/8 | 9 3/8 | - | - | - | - | - | | |
| 4 | 6 1/2 | | | | 7 1/4 | 7 1/4 | 8 3/8 | - | - | - | - | 9 5/8 | 9 3/8 | 9 3/8 | 9 3/8 | 9 3/8 | 9 3/8 | - | - | - | - | - |
| 5 | 7 3/4 | | | | 7 3/4 | 7 3/4 | 9 3/8 | 9 3/8 | - | - | - | 10 1/4 | 10 1/4 | 10 1/4 | 10 1/4 | 10 1/4 | 10 1/4 | 10 1/4 | 10 1/4 | - | - | - |
| 6 | 8 3/8 | 8 3/8 | 8 3/8 | 10 | 10 | - | - | - | 11 7/8 | - | - | 10 3/4 | 10 3/4 | 10 3/4 | 10 3/4 | 10 3/4 | 10 3/4 | 11 1/8 | 12 | - | - | |
| 8 | 9 3/8 | 9 3/8 | 9 3/8 | 11 1/4 | 11 1/4 | 11 1/4 | 12 5/8 | - | - | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 11 3/4 | 12 3/8 | 13 3/8 | 13 3/8 | - | |
| 10 | 10 1/2 | 10 1/2 | 10 1/2 | 12 3/4 | 12 3/4 | 12 3/4 | 14 1/4 | 14 1/4 | 16 1/4 | 12 3/4 | 12 3/4 | 12 3/4 | 12 3/4 | 12 3/4 | 12 3/4 | 12 3/4 | 12 3/4 | 13 5/8 | 14 3/4 | 14 3/4 | - | |
| 12 | - | 11 7/8 | 11 7/8 | 13 7/8 | 13 7/8 | 13 7/8 | 15 3/8 | 15 3/8 | 17 1/4 | - | 13 3/4 | 13 3/4 | 13 3/4 | 13 3/4 | 13 3/4 | 13 3/4 | 13 3/4 | 14 3/4 | 15 7/8 | 16 | - | |
| 14 | - | 12 5/8 | 12 5/8 | 14 1/2 | 14 1/2 | 14 1/2 | 16 | 16 1/4 | 18 | - | 14 3/8 | 14 3/8 | 14 3/8 | 14 3/8 | 14 3/8 | 14 3/8 | 14 3/8 | 15 3/8 | 17 1/4 | 17 1/4 | - | |
| 16 | - | 13 5/8 | 13 5/8 | 15 1/4 | 15 1/4 | 15 1/4 | 17 1/8 | 17 1/2 | 19 | - | 15 3/8 | 15 3/8 | 15 3/8 | 15 3/8 | 15 3/8 | 15 3/8 | 15 3/8 | 16 7/8 | 18 3/8 | 18 1/2 | 19 | |
| 18 | - | 14 5/8 | 14 5/8 | 16 3/8 | 16 3/8 | 16 3/8 | 18 1/4 | 18 1/2 | 20 1/4 | - | 16 3/8 | 16 3/8 | 16 3/8 | 16 3/8 | 16 1/2 | 16 1/2 | 18 | 19 1/2 | 19 5/8 | 20 1/4 | - | |
| 20 | - | 15 3/4 | 15 3/4 | 17 3/4 | 17 3/4 | 17 3/4 | 19 1/4 | 19 3/4 | 21 1/2 | - | 17 3/8 | 17 3/8 | 17 3/8 | 17 3/8 | 17 1/2 | 17 1/2 | 19 3/8 | 20 3/8 | 20 7/8 | 21 1/2 | - | |
| 24 | - | 18 1/8 | 18 1/8 | 19 7/8 | 19 7/8 | 19 7/8 | 21 3/4 | 21 3/4 | 24 | - | 19 3/8 | 19 3/8 | 19 3/8 | 19 3/8 | 20 3/8 | 20 3/8 | 21 1/2 | 22 1/2 | 23 | 24 | - | |
| 30 | - | 21 1/4 | 21 1/4 | 23 | 23 | 23 | 25 | 25 | 28 | - | 22 3/8 | 22 3/8 | 22 3/8 | 22 3/8 | 23 1/2 | 23 1/2 | 24 1/2 | 26 3/8 | 26 | 28 | - | |
| 36 | - | 24 | 24 | 26 1/2 | 26 1/2 | 26 1/2 | 28 1/2 | 28 1/2 | 31 1/4 | - | 25 3/8 | 25 3/8 | 25 3/8 | 25 3/8 | 26 5/8 | 26 5/8 | 27 1/2 | 29 5/8 | 30 | 31 1/4 | - | |

* Please specify temperature when ordering.

**Intermediate sizes between 20 and 36 are available and will have the takeout and stock size of the next larger size.

Note: Carbon steel clamps will accommodate 4" of insulation. Alloy clamps will accommodate 6 1/2".

High temperature clamps will be made from alloy steel. Stainless steel available upon request. For other special design requirements, please contact your Anvil EPS sales representative.

SWAY STRUT ASSEMBLY

Fig. 211, Fig. C-211

Sway Strut Assembly

Fig. 640, Fig. C-640: Field Welded Strut

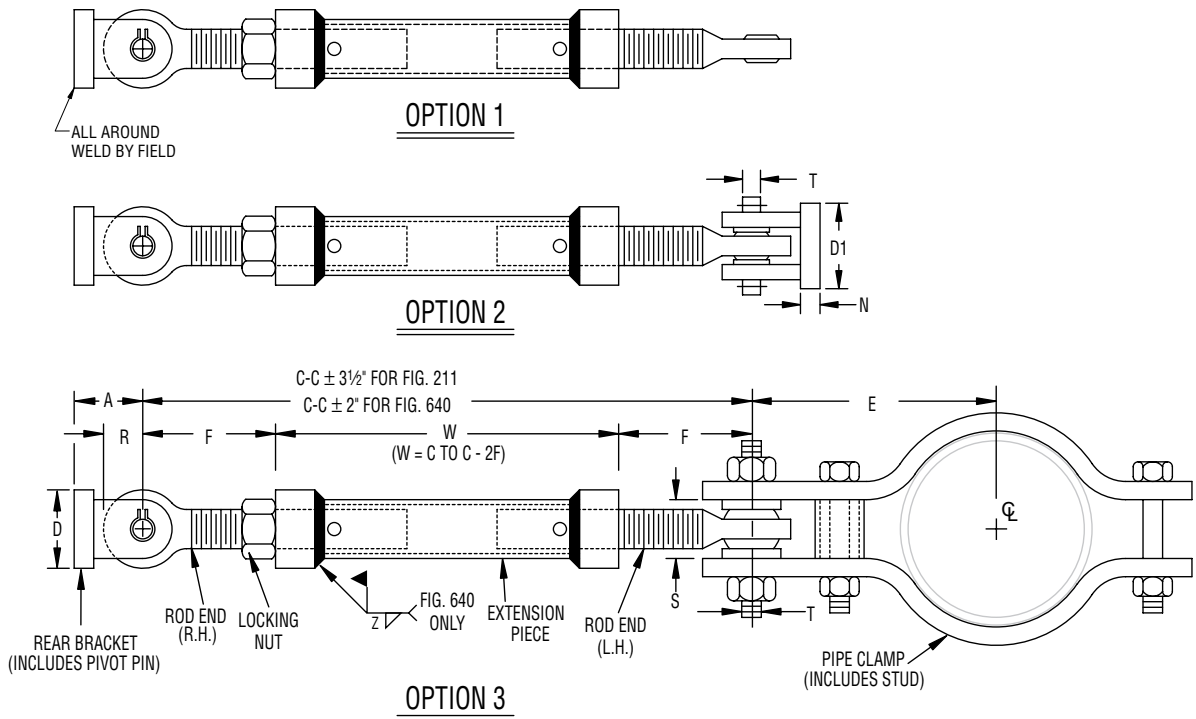


FIG. 211, C-211, FIG. 640 & FIG. C-640: DIMENSIONS (IN) • LOAD (LBS)

| Size | Fig. 211 & Fig. 640 | | | | | | | | | | Fig. 211 | | | | | Fig. 640 | | | |
|------|---------------------|------------|---------------|-------|-------|-------|--------|-------|-------|----------------|----------------|----------------|----------------|----------------|----------------|-----------|----------------|---------|---------|
| | Load ■ | Rod End | Ext. Piece | A | D | D1 | N | R | S | T | C-C | | W | | F | Weld Z | C-C | | F |
| | | | | | | | | | | | Max | Min | Max | Min | | | Max | Min | |
| A | 650 | 3/4 | 1 | 1 | 2 | 1 1/4 | 1/4 | 5/8 | 5/8 | 0.374 0.372 | 60 | 16 1/2 | 53 3/8 | 9 5/8 | 3 7/16 | 3/16 | 60 | 12 3/8 | 2 11/16 |
| B | 1,500 | 1 | 1 1/2 | 2 1/2 | | 2 3/8 | 5/8 | 1 3/8 | 1 3/8 | 0.749 0.747 | 108 | 19 | 99 3/8 | 10 3/8 | 4 7/16 | | 96 | 14 7/16 | 3 11/16 |
| C | 4,500 | 1 | 2 | | 3 | 3 | 3 3/16 | 3/4 | | 2 | 0.749 0.747 | 120 | 21 | 110 3/8 | 10 3/8 | 4 7/8 | | 5/16 | 16 1/2 |
| 1 | 8,000 | 1 1/4 | | 2 1/2 | | | | | 3 | | 3 | | | | | | 3 3/16 | | |
| 2 | 11,630 | 1 1/2 | 3 | | 4 | 6 3/8 | 4 1/4 | 1 1/4 | | 2 1/2 | | 0.999 0.997 | 26 1/2 | 106 1/2 | 13 | 6 3/4 | | 5/8 | 22 |
| 3 | 15,700 | 1 3/4 | | 4 | | | | | 5 | | 7 7/8 | 5 3/8 | | | | | 1 3/4 | | |
| 4 | 20,700 | 2 | 5 3/4 | | 9 3/8 | 6 1/4 | 2 | 3 1/2 | | 3 | | | 1.499 1.497 | 32 1/2 | 102 1/2 | 15 | | 8 3/4 | 5/8 |
| 5 | 27,200 | 2 1/4 | | 7 1/4 | | | | | 14 | | 8 3/4 | 2 1/4 | 4 3/4 | | | | 3 1/2 | | |
| 6 | 33,500 | 2 1/2 | 7 1/4 | | 14 | 8 3/4 | 2 1/4 | 4 3/4 | | 3 1/2 | | | | 1.999 1.997 | 39 1/4 | 98 | | 17 1/4 | 11 |
| 7 | 68,200 | 3 | | 7 1/4 | | | | | 14 | | 8 3/4 | 2 1/4 | 4 3/4 | 3 1/2 | | | 2.499 2.497 | | |
| 8 | 120,000 | 4 | 7 1/4 | | 14 | 8 3/4 | 2 1/4 | 4 3/4 | | 3 1/2 | | | | | 2.499 2.497 | 39 1/4 | 98 | 17 1/4 | 11 |

■ Loads must not be applied outside a 10° included angle cone of action to the pipe clamp axis without special authorization.
Fig. 640 shipped at maximum length C-C, field cut to "W" to suit, unless otherwise specified.

Fig. 222, C-222

Mini-Sway Strut Assembly

Finish: Painted or Galvanized

Service: Used to restrain movement of piping in one direction while allowing movement in the other two directions.

How to size:

- (1) Select size consistent with max. load to be restrained.
- (2) C to C is obtained by subtracting E and A from the distance from structural steel to center of pipe. Verify that the calculated C to C is within the min/max limits.

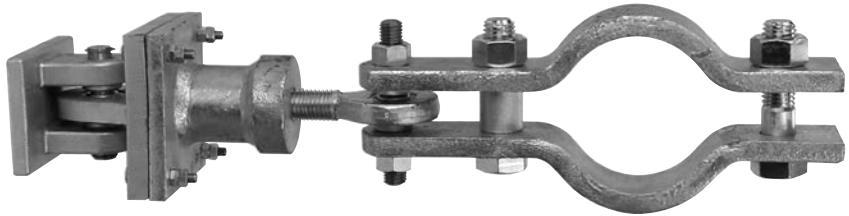
Installation: Shipped assembled. Securely fasten bracket to structure, make necessary adjustment in overall length, and fasten clamp to pipe.

Features:

- Assembly provides a shorter C to C dimension.
- Effective under either tensile or compressive force.
- Self-aligning bushings permit ± 5 misalignment or angular motion. Bushings are coated with a dry lubricant.

Ordering: Specify assembly size, figure number, name, finish, pipe O.D. or option number, if other than standard, and load. Ex: Size A-1, Fig. 222 mini sway strut 10 $\frac{3}{4}$ O.D. pipe, 650#. Alloy pipe clamps are available as a special order. For restraint parallel to the pipe axis using two sway strut assemblies, a riser clamp is available. Contact your Anvil representative for information about this clamp.

Note: The rear bracket assembly can be ordered separately



| E-TAKE OUT: DIMENSIONS (IN) | | | |
|-----------------------------|------------------|-----------------|-----------------|
| Pipe Size | Size A | Size B & C | Size 1 |
| $\frac{3}{4}$ | $2\frac{7}{16}$ | – | – |
| 1 | $2\frac{9}{16}$ | – | – |
| $1\frac{1}{4}$ | $2\frac{11}{16}$ | – | – |
| $1\frac{1}{2}$ | $4\frac{1}{8}$ | – | – |
| 2 | $5\frac{1}{8}$ | $6\frac{3}{8}$ | $6\frac{3}{8}$ |
| $2\frac{1}{2}$ | $5\frac{3}{8}$ | 7 | 7 |
| 3 | $5\frac{15}{16}$ | | |
| $3\frac{1}{2}$ | $6\frac{3}{16}$ | | |
| 4 | $6\frac{1}{2}$ | $7\frac{1}{4}$ | $7\frac{1}{4}$ |
| 5 | $7\frac{3}{4}$ | $7\frac{3}{4}$ | $7\frac{3}{4}$ |
| 6 | $8\frac{3}{8}$ | $8\frac{3}{8}$ | $8\frac{3}{8}$ |
| 8 | $9\frac{3}{8}$ | $9\frac{3}{8}$ | $9\frac{3}{8}$ |
| 10 | $10\frac{1}{2}$ | $10\frac{1}{2}$ | $10\frac{1}{2}$ |
| 12 | – | $11\frac{7}{8}$ | $11\frac{7}{8}$ |
| 14 | – | $12\frac{5}{8}$ | $12\frac{5}{8}$ |
| 16 | – | $13\frac{5}{8}$ | $13\frac{5}{8}$ |
| 18 | – | $14\frac{5}{8}$ | $14\frac{5}{8}$ |
| 20 | – | $15\frac{3}{4}$ | $15\frac{3}{4}$ |
| 24 | – | $18\frac{1}{8}$ | $18\frac{1}{8}$ |
| 30 | – | $21\frac{1}{4}$ | $21\frac{1}{4}$ |
| 36 | – | 24 | 24 |

Note: "E" Dimensions are for carbon steel clamps only, with maximum insulation of 4" and temperature of 650°. For clamp takeouts for temperatures above 650°F, see corresponding size of Fig. 211.

SWAY STRUT ASSEMBLY

Fig. 222, C-222

Mini-Sway Strut Assembly (cont.)

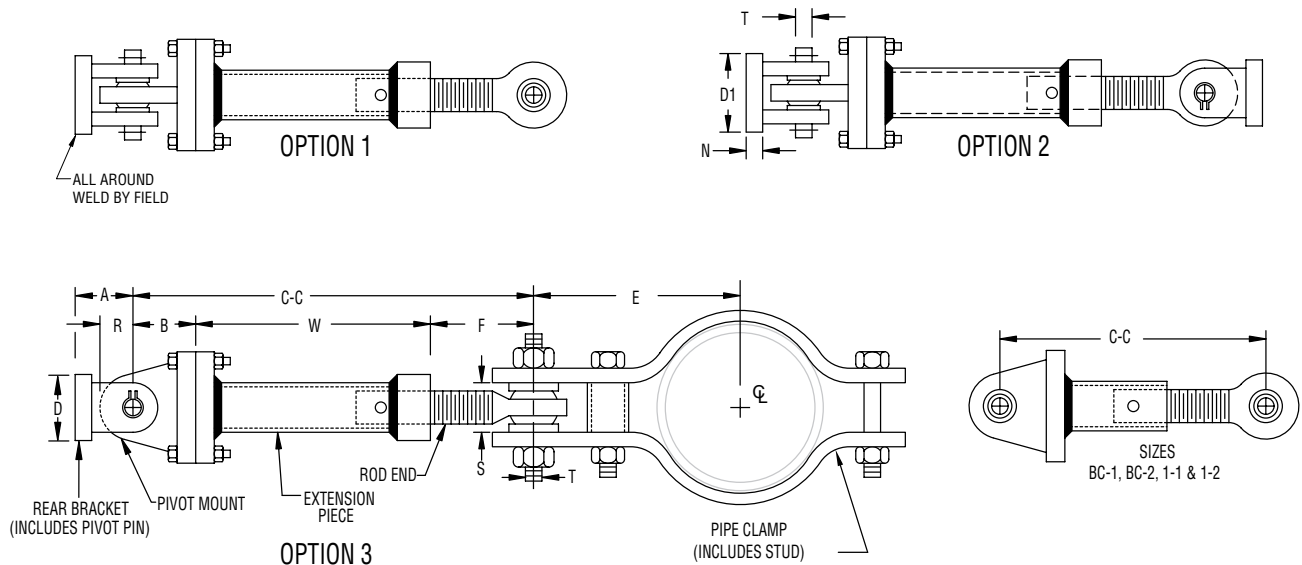


FIG. 222, C-222: DIMENSIONS (IN) • LOADS (LBS)

| Assembly Size | Load | C-C | | F | | W | Rod End | A | D | D1 | N | R | S | T Nom. | B |
|---------------|------|----------------------------------|----------------------------------|---------------------------------|---------------------------------|---------------------------------|-------------------------------|-------------------------------|---|-------------------------------|-----|--------------------------------|-------------------------------|--------|--------------------------------|
| | | Max | Min | Max | Min | | | | | | | | | | |
| A | A-1 | 6 ⁵ / ₁₆ | 5 ⁵ / ₈ | 2 ¹³ / ₁₆ | 1 ¹ / ₁₆ | 2 ⁵ / ₈ | 3/4 | 1 | 2 | 1 ¹ / ₄ | 1/4 | 5/8 | 5/8 | 3/8 | 1 ³ / ₁₆ |
| | A-2 | 8 ¹ / ₂ | 6 ¹ / ₂ | 4 ¹ / ₄ | 2 ¹ / ₄ | 3 ¹ / ₁₆ | | | | | | | | | |
| | A-3 | 13 ³ / ₄ | 8 ¹ / ₂ | 6 ¹ / ₄ | 1 ¹ / ₂ | 5 ¹³ / ₁₆ | | | | | | | | | |
| B & C | BC-1 | 6 ¹ / ₂ | 6 | 2 ⁷ / ₈ | 2 ³ / ₈ | 1 ¹ / ₂ | 1 | 2 ¹ / ₂ | 2 | 2 ³ / ₈ | 5/8 | 1 ³ / ₈ | 1 ³ / ₈ | 3/4 | 2 ¹ / ₈ |
| | BC-2 | 7 ³ / ₄ | 6 ⁵ / ₈ | 3 ¹ / ₂ | 2 ³ / ₈ | 2 ¹ / ₈ | | | | | | | | | |
| | BC-3 | 8 ¹¹ / ₁₆ | 7 ⁹ / ₁₆ | 3 ¹³ / ₁₆ | 2 ¹¹ / ₁₆ | 2 ³ / ₄ | | | | | | | | | |
| | BC-4 | 10 ¹⁵ / ₁₆ | 8 ¹ / ₁₆ | 4 ¹⁵ / ₁₆ | 2 ¹¹ / ₁₆ | 3 ⁷ / ₈ | | | | | | | | | |
| | BC-5 | 15 ⁷ / ₁₆ | 10 ¹⁵ / ₁₆ | 7 ³ / ₁₆ | 2 ¹¹ / ₁₆ | 6 ¹ / ₈ | | | | | | | | | |
| | BC-6 | 19 ⁹ / ₁₆ | 15 ⁷ / ₁₆ | 9 ¹ / ₄ | 5 ¹ / ₈ | 8 ³ / ₁₆ | | | | | | | | | |
| 1 | 1-1 | 8 ⁷ / ₈ | 8 | 3 ¹ / ₁₆ | 2 ¹³ / ₁₆ | 2 ¹⁵ / ₁₆ | 1 ¹ / ₄ | 2 ¹ / ₂ | 2 | 2 ⁷ / ₈ | 3/4 | 1 ⁹ / ₁₆ | 1 ³ / ₈ | 1 | 2 ¹ / ₄ |
| | 1-2 | 10 ⁵ / ₈ | 8 ⁷ / ₈ | 4 ⁹ / ₁₆ | 2 ¹³ / ₁₆ | 3 ¹³ / ₁₆ | | | | | | | | | |
| | 1-3 | 11 ⁷ / ₈ | 10 ¹ / ₄ | 4 ¹³ / ₁₆ | 3 ³ / ₁₆ | 4 ¹³ / ₁₆ | | | | | | | | | |
| | 1-4 | 15 ⁵ / ₈ | 11 ⁷ / ₈ | 6 ⁷ / ₁₆ | 3 ³ / ₁₆ | 6 ⁷ / ₁₆ | | | | | | | | | |
| | 1-5 | 21 ⁵ / ₈ | 15 ⁵ / ₈ | 9 ¹¹ / ₁₆ | 3 ³ / ₁₆ | 9 ¹¹ / ₁₆ | | | | | | | | | |

■ Loads must not be applied outside a 10° included angle cone of action to the pipe clamp axis without special authorization.

SWAY STRUT ASSEMBLY

Sway Strut

Check List for Requesting a Quote or Ordering

Page ___ of ___



Anvil International
Precision Park
160 Frenchtown Rd.
North Kingstown, RI 02852

For technical information regarding
Sway Struts Call or Email:
Phone Number: (401) 886-3020
Email: eps_contact@anvilintl.com

Finish: Standard Primer: _____ Galvanized: _____ Special Coating: _____

Quantity: _____

Figure No.: Options are: 211, 640

or: C-211, C-640

Size: Options are: A, B, C and 1 thru 8 _____

Options are: 1 (1 Rear Bkt) _____

2 (2 Rear Bkt) _____

3 (1 Rear Bkt & Pipe Clamp)

Pipe Size _____

Pipe Material: Carbon Steel, Alloy*, Stainless*

* If alloy or stainless required., please provide temperature and insulation thickness.

Mark Number: _____ (If Required)

"W": _____ (If Required)

Fig. 200, Fig. C-200 Fig. 201, Fig. C-201: with Extension Piece

Hydraulic Snubber

Size Range: Seven standard sizes with cylinder bores of 1½" to 8" and with normal load ratings from 3,000 pounds to 128,000 pounds. All are available with 5", 10", 15", or 20" strokes except the 1½" size which is offered with 5" and 10" strokes only. Snubbers are available with integral or remote reservoirs.

Finish: Fig. 200/201 painted with semi gloss primer.

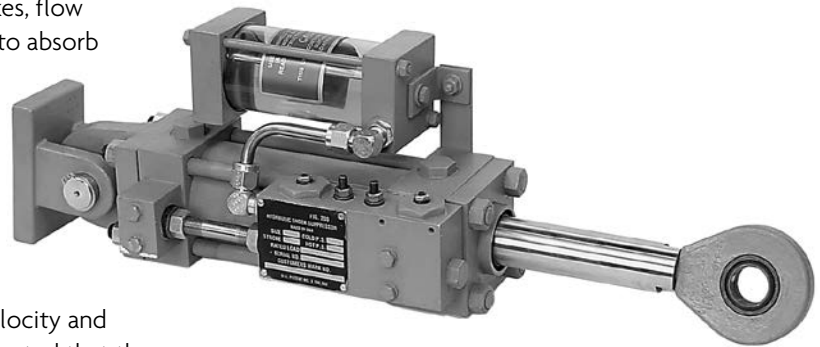
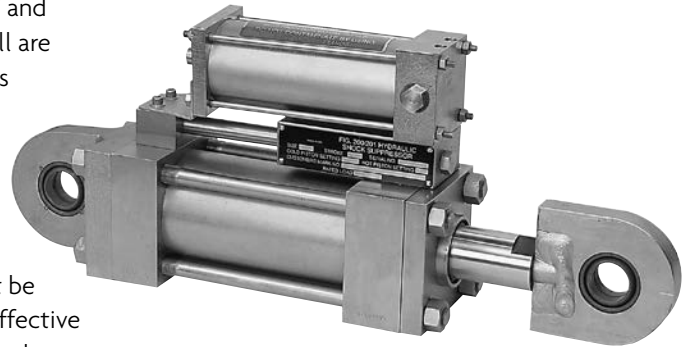
Fig. C-200/C-201 corrosion resistant; painted with carbo zinc.

Service: 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. Use with standard settings to prevent destructive response 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.

Standard settings: The standard settings are: Locking (activation) velocity 8 ±2 in/min. Bleed rate (post activation) at normal rated load 4 ±1 in/min. (Special settings are available). The valves are calibrated at the factory within the tolerances indicated at room temperature. Locking velocity and bleed rate will vary with temperature. Testing has indicated that there is little effect of these changes on dynamic operation.

Features:

- Choice of valve type
 - Adjustable – permits field adjustments
 - Temperature compensating – minimizes the effects of temperature on lockup and bleed
- Choice of reservoir type
 - Transparent – continuous operation at 200° F with brief transients to 250° F
 - Metal or pressurized metal – allows brief transients to 340° F
 - Pressurized – eliminates the concern of reservoir orientation relative to valve and cylinder – minimizes internal contamination
 - Remote
- Factory calibrated valves
- Rapid, positive valve closure
- Special design minimizes the “lost motion” which results from the shifting and seating of piston seals
- Unlocked resisting force is less than 1% of rated load
- Stable, non-flammable, long life hydraulic fluid made highly visible for ease of inspection
- Self-aligning bushings permit ± 5° misalignment or angular motion. Bushings are coated with a dry lubricant.
- Choice of coating (paint, primer, carbo zinc, epoxy, plating or other)



| LOADS (LBS) | |
|--------------------------|------------|
| Cylinder Size (in) | Max Load * |
| 1½ (5" stroke) | 3,000 |
| 1½ (10" stroke) | 1,250 |
| 2½ (5", 10", 15" stroke) | 12,500 |
| 2½ (20" stroke) | 10,500 |
| 3¾ | 21,000 |
| 4 | 32,000 |
| 5 | 50,000 |
| 6 | 72,000 |
| 8 | 128,000 |

* Loads must not be applied outside a 10° included angle cone of action to the pipe clamp axis without special authorization.

Fig. 200, Fig. 201 Hydraulic

Snubber (cont.)

Upgrade Kits: Kits are available to upgrade existing snubbers with temperature compensating valves and/or pressurized reservoir.

How to size:

- (1) **Cylinder size:** Use table on page 228 to select cylinder bore size large enough to restrain expected load.
- (2) **Stroke:** Define expected movement of the pivot joining the suppressor with the equipment to be protected (cold to hot plus any abnormal movements). Determine maximum and minimum distances between this curve and the fixed pivot pin of the snubber. The minimum recommended stroke is 20% greater than the difference between these lengths.
Note: If erected position at the snubber's location on the equipment is outside of the range of normal cold-to-hot movement (e.g. cold pull of pipe), the snubber should not be installed until after the equipment is in its cold position. This eliminates the need of providing for the extra travel in the snubber's stroke. For 2 1/2" through 8" snubbers, standard strokes are 5", 10", 15", and 20". For the 1 1/2" snubber, 5" and 10" are the only standard strokes.
- (3) **Installed piston setting:** As indicated previously, the snubber should be installed at its cold piston position if possible. From the installed position, take extension (outward movement) of the piston rod as positive (+) and retraction as negative (-).
- (4) **Installed piston position =**

$$\left(\frac{\text{Stroke} - (\text{Algebraic Sum of Movements})}{2} \right)$$

To aid in measuring the piston position, we have shown a dimension, "Z". This dimension represents the distance between the cylinder head and the end of the rod when the rod is fully retracted. Whenever specifying the position at which the piston rod is to be set, the total dimension from the cylinder head to the end of the rod should be given. Thus, Piston Setting = Piston Position + Z.

- (5) **Assembly length:** Determine the installed "C" dimension by adding the installed piston position (not setting) to C minimum. Lay in take out dimensions E and/or B, and find required pin-to-pin snubber length. If a pin-to-pin length adjustment is desired, use Fig. 201. Calculate the required "W" dimension by subtracting (C installed + F) from the required pin-to-pin length. If this is less than W minimum, only a Fig. 200 can be used, and one of the attachments will have to be moved or shimmed to suit. If a Fig. 200 is to be used, make sure that the required pin-to-pin length is at least as great as (C installed + B). If neither a Fig. 200 nor a Fig. 201 can be accommodated, and the installation cannot be modified, consult your Anvil representative about designing a special or modified unit.

Ordering:

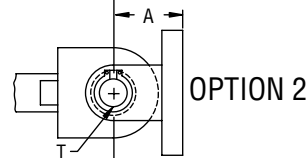
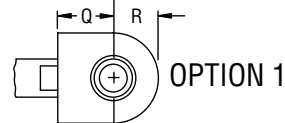
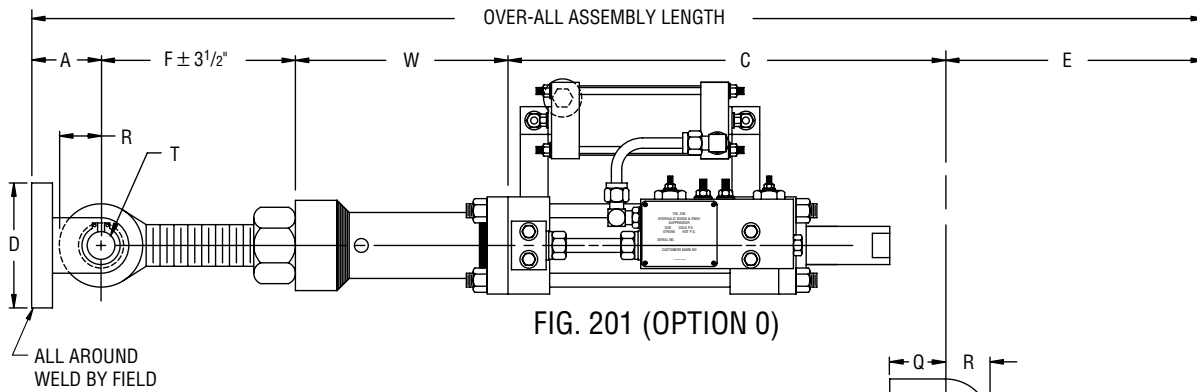
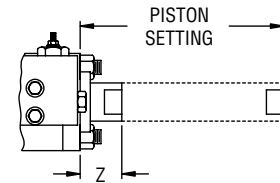
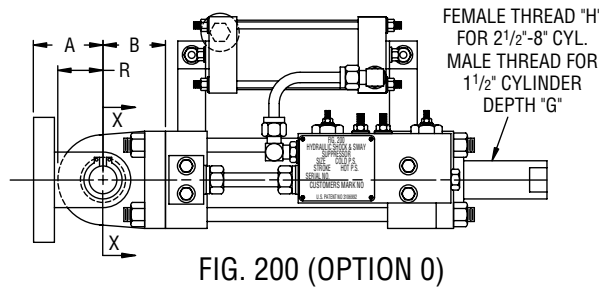
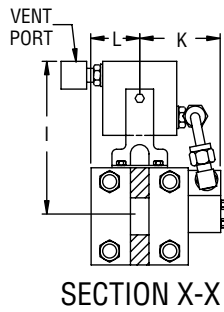
| Ordering: Specify part number as follows: | | | | | | |
|---|---|----|---|---|---|---|
| XXX | X | XX | X | X | X | X |
| | | | | | | Reservoir Orientation O=Does not apply for pressurized or remote U=Rod up D=Rod down or horizontal |
| | | | | | | Reservoir Type L=Transparent (Polycarbonate) M=Metal (limited applications) P=Pressurized R=Remote |
| | | | | | | Valve Type A=Adjustable T=Temperature Compensating |
| | | | | | | Option (0,1,2, or 3), See Option Table Below |
| | | | | | | Stroke (5, 10, 15, 20) |
| | | | | | | Cylinder Size: 1 (1 1/2 Cyl.) 2 (2 1/2 Cyl.) 3 (3 1/4 Cyl.) 4 (4Cyl.) 5 (5Cyl.) 6 (6Cyl.) 8 (8 Cyl.) |
| | | | | | | Figure No. (200 or 201), Also Specify: W Dimension when Specifying Fig 201 Pipe Clamp Size when Specifying Option 3 Surface Coating Cold and Hot Piston Settings. |

FIG. 200 & FIG. 201 OPTIONS

| Option | Consists of... |
|--------|--|
| 0 | Fig 200: Basic unit (snubber) with pivot mount and one rear bracket. |
| | Fig. 201: Basic unit with extension piece and one rear bracket. |
| 1 | Option 0 plus cylinder eye. |
| 2 | Option 0 plus cylinder eye and additional rear bracket. |
| 3 | Option 0 plus cylinder eye and pipe clamp. |

Fig. 200, Fig. 201

Hydraulic Snubber (cont.)



NOTE:
CYLINDER EYE
MAY BE ROTATED
TO ANY POSITION

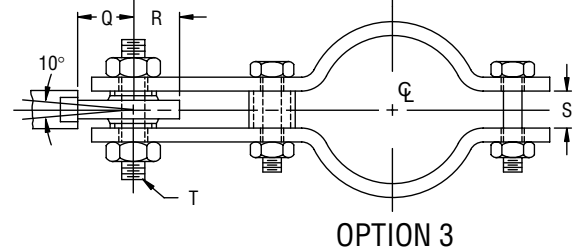
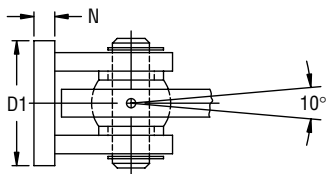


Fig. 200, Fig. 201

Hydraulic Snubber (cont.)

FIG 200, 201: DIMENSIONS (IN) • WEIGHT (LBS)

| Cylinder Bore | Stroke | Fig. 200 Wt. | A | B | C | | | D | D ₁ | F | G | H | I | | | K | L | N | Q | R | S | T | W | | Z |
|---------------|--------|--------------|----|----|-----|-----|-----|----|----------------|-----|----|-------|------------|-------------|------------|----|----|----|----|----|----|----|-----|-----|----|
| | | | | | Min | Mid | Max | | | | | | Metal Res. | Trans. Res. | Press Res. | | | | | | | | Min | Max | |
| 1½ | 5 | 45 | 2½ | 1½ | 13⅛ | 15⅝ | 18⅛ | 2 | 2⅝ | 6 | ¾ | ⅝-18 | 5⅞ | 4⅜ | 4¾ | 2¼ | 2¼ | ⅝ | 2⅝ | 1⅝ | 1 | ¾ | 9½ | 75⅝ | ⅝ |
| | 10 | 49 | | | 18⅞ | 23⅞ | 28⅞ | | | | | | | | | | | | | | | | | 65⅝ | |
| 2½ | 5 | 75 | 2½ | 2¼ | 13⅜ | 15⅞ | 18⅜ | 2 | 2⅞ | 7¾ | ⅞ | ⅞-14 | 6¼ | 5⅞ | 5¾ | 3¼ | 1¾ | ¾ | 2 | 1⅝ | 1⅜ | 1 | 10¾ | 94⅞ | 1 |
| | 10 | 81 | | | 18⅜ | 23⅜ | 28⅜ | | | | | | | | | | | | | | | | | 84⅞ | |
| | 15 | 87 | | | 23⅜ | 30⅞ | 38⅞ | | | | | | | | | | | | | | | | | 74⅞ | |
| | 20 | 93 | | | 28⅜ | 38⅞ | 48⅞ | | | | | | | | | | | | | | | | | 64⅞ | |
| 3¼ | 5 | 121 | 3 | 3 | 14⅞ | 17⅞ | 19⅞ | 3 | 3⅜ | 7⅞ | 1⅞ | 1⅞-12 | 6⅞ | 5¾ | 6¾ | 3¾ | 2¼ | ¾ | 2½ | 2⅞ | 1⅞ | 1¼ | 10½ | 92 | 1⅞ |
| | 10 | 132 | | | 19⅞ | 24⅞ | 29⅞ | | | | | | | | | | | | | | | | | 82 | |
| | 15 | 146 | | | 24⅞ | 32⅞ | 39⅞ | | | | | | | | | | | | | | | | | 72 | |
| | 20 | 156 | | | 29⅞ | 39⅞ | 49⅞ | | | | | | | | | | | | | | | | | 62 | |
| 4 | 5 | 177 | 4 | 3¾ | 16⅞ | 18⅞ | 21⅞ | 6⅞ | 4¼ | 9⅞ | 1½ | 1½-12 | 7⅞ | 6 | 7⅞ | 4 | 2½ | 1¼ | 3⅞ | 2½ | 2 | 1½ | 11½ | 89⅞ | 1⅞ |
| | 10 | 189 | | | 21⅞ | 26⅞ | 31⅞ | | | | | | | | | | | | | | | | | 79⅞ | |
| | 15 | 206 | | | 26⅞ | 33⅞ | 41⅞ | | | | | | | | | | | | | | | | | 69⅞ | |
| | 20 | 223 | | | 31⅞ | 41⅞ | 51⅞ | | | | | | | | | | | | | | | | | 59⅞ | |
| 5 | 5 | 235 | 5 | 4½ | 18 | 20½ | 23 | 7⅞ | 5⅝ | 10⅞ | 1⅞ | 1⅞-12 | 8½ | 7 | 9⅞ | 4¼ | 3¼ | 1¾ | 4 | 3⅞ | 2⅝ | 1¾ | 12 | 86⅞ | 1⅞ |
| | 10 | 256 | | | 23 | 28 | 33 | | | | | | | | | | | | | | | | | 76⅞ | |
| | 15 | 277 | | | 28 | 35½ | 43 | | | | | | | | | | | | | | | | | 66⅞ | |
| | 20 | 298 | | | 33 | 43 | 53 | | | | | | | | | | | | | | | | | 56⅞ | |
| 6 | 5 | 292 | 5¾ | 5½ | 19¾ | 22¼ | 24¾ | 9⅞ | 6¼ | 11⅞ | 2¼ | 2¼-12 | 9⅞ | 7⅝ | 10⅞ | 5¼ | 3⅞ | 2 | 4⅝ | 3⅞ | 2¾ | 2 | 13¾ | 83⅞ | 1¾ |
| | 10 | 320 | | | 24¾ | 29¾ | 34¾ | | | | | | | | | | | | | | | | | 73⅞ | |
| | 15 | 348 | | | 29¾ | 37¼ | 44¾ | | | | | | | | | | | | | | | | | 63⅞ | |
| | 20 | 375 | | | 34¾ | 44¾ | 54¾ | | | | | | | | | | | | | | | | | 53⅞ | |
| 8 | 5 | 515 | 7¼ | 6 | 23½ | 26 | 28½ | 14 | 8¾ | 14½ | 4 | 3-12 | 12½ | N/A | 13⅞ | 8½ | 4⅞ | 2¼ | 6¾ | 4¾ | - | 2½ | 14½ | 75½ | 2¼ |
| | 10 | 575 | | | 28½ | 33½ | 38½ | | | | | | | | | | | | | | | | | 65½ | |
| | 15 | 640 | | | 33½ | 41 | 48½ | | | | | | | | | | | | | | | | | 55½ | |
| | 20 | 705 | | | 38½ | 48½ | 58½ | | | | | | | | | | | | | | | | | 45½ | |

FIG 200, 201: DIMENSIONS (IN)

| Pipe Size** | E-Take Out 650°F (Max.) | | | | | | E Dimension 1075°F* (Max.) | | | | | |
|-------------|-------------------------|-----|-----|-----|-----|-----|----------------------------|-----|-----|-----|-----|-----|
| | Cylinder Bore | | | | | | Cylinder Bore | | | | | |
| | 1½ | 2½ | 3¼ | 4 | 5 | 6 | 1½ | 2½ | 3¼ | 4 | 5 | 6 |
| 2 | 6 | 6⅝ | - | - | - | - | 9⅞ | 9⅞ | - | - | - | - |
| 2½ | 7 | 7 | - | - | - | - | 9⅞ | 9⅞ | - | - | - | - |
| 3 | 7 | 7 | - | - | - | - | 9⅞ | 9⅞ | - | - | - | - |
| 3½ | 7 | 7 | - | - | - | - | 9⅞ | 9⅞ | 9⅞ | - | - | - |
| 4 | 7¼ | 7¼ | - | - | - | - | 9⅞ | 9⅞ | 9⅞ | - | - | - |
| 5 | 7¾ | 7¾ | 9⅞ | 10 | - | - | 10¼ | 10¼ | 10¼ | 10⅞ | - | - |
| 6 | 8⅞ | 8⅞ | 10 | 10 | 11⅞ | - | 10¾ | 10¾ | 10¾ | 11⅞ | 12 | - |
| 8 | 9⅞ | 9⅞ | 11¼ | 11¼ | 12⅝ | - | 11¾ | 11¾ | 11¾ | 12⅞ | 13⅞ | - |
| 10 | 10½ | 10½ | 12¾ | 12¾ | 14¼ | - | 12¾ | 12¾ | 12¾ | 13⅝ | 14¾ | - |
| 12 | 11⅞ | 11⅞ | 13⅞ | 13⅞ | 15⅞ | - | - | 13¾ | 13¾ | 14¾ | 15⅞ | - |
| 14 | 12⅝ | 12⅝ | 14½ | 14½ | 16 | - | - | 14⅞ | 14⅞ | 15⅞ | 17¼ | 17¼ |
| 16 | 13⅞ | 13⅞ | 15¼ | 15¼ | 17⅞ | - | - | 15⅞ | 15⅞ | 16⅞ | 18⅞ | 18½ |
| 18 | 14⅝ | 14⅝ | 16⅞ | 16⅞ | 18¼ | - | - | 16⅞ | 16½ | 18 | 19½ | 19⅞ |
| 20 | 15¾ | 15¾ | 17¾ | 17¾ | 19¼ | 19¼ | - | 17⅞ | 17½ | 19⅞ | 20⅞ | 20⅞ |
| 24 | 18⅞ | 18⅞ | 19⅞ | 19⅞ | 21¾ | 21¾ | - | 19⅞ | 20⅞ | 21½ | 22½ | 23 |
| 30 | 21¼ | 21¼ | 23 | 23 | 25 | 25 | - | 22⅞ | 23½ | 24½ | 26⅞ | 26⅞ |
| 36 | 24 | 24 | 26½ | 26½ | 28⅞ | 28⅞ | - | 25⅞ | 26⅞ | 27½ | 29⅞ | 30 |

* Please specify temperature when ordering.

**Intermediate sizes between 20 and 36 are available and will have the takeout and stock size of the next larger size.

Note: Carbon steel clamps can accommodate up to 4" insulation. Alloy can accommodate 6½".

High temperature clamps will be made from alloy steel. Stainless steel available upon request. For other special design requirements, please contact your Anvil EPS sales representative.

Fig. 312

Tapered Pin

Size Range: $\frac{3}{8}$ " through $2\frac{1}{2}$ "

Service: Used as a replacement to standard rear bracket load pin to facilitate easy removal at time of rebuild or testing. May be supplied with new orders, when specified.

How to size: Select size consistent with load pin diameter for Fig. 200/201 or Fig. 3306/3307.

Features:

- Designed to sharply reduce the time necessary to remove a badly corroded conventional pin and may also eliminate damage to the bushing and bracket assembly, particularly if the pin and bracket are corroded.
- Minimizes "free play" between pin to pin.

Ordering: Specify figure number, nominal pin size and name.

Installation: Shipped assembled. Remove nuts and washer. Loosen sleeve on pin and install sleeve/pin. Re-install washer and one nut. Tighten hex nut to snug. Install second nut.

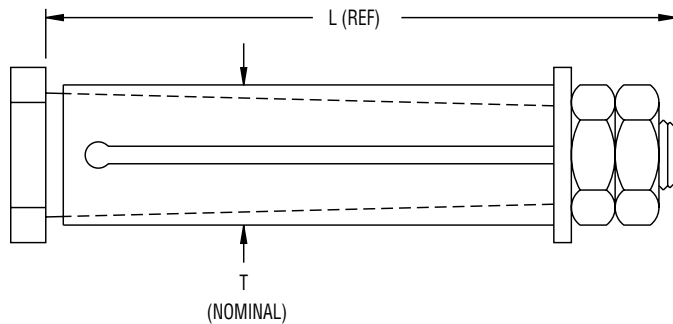


FIG 312: DIMENSIONS (IN) • LOADS (LBS)

| Nominal Dia. T | Max Load | L | Compatible With | |
|----------------|----------|------------------|-----------------|-------------------------------|
| | | | Fig. 200/201 | Fig. 3306/3307 |
| $\frac{3}{8}$ | 650 | $1\frac{61}{64}$ | – | $\frac{1}{4}$ & $\frac{1}{2}$ |
| $\frac{1}{2}$ | 1,500 | $2\frac{3}{8}$ | – | 1 |
| $\frac{3}{4}$ | 6,000 | $3\frac{3}{8}$ | $1\frac{1}{2}$ | 3 |
| 1 | 15,000 | $4\frac{3}{8}$ | $2\frac{1}{2}$ | 10 |
| $1\frac{1}{4}$ | 21,000 | $4\frac{1}{2}$ | $3\frac{3}{4}$ | – |
| $1\frac{1}{2}$ | 50,000 | $7\frac{1}{8}$ | 4 | 35 |
| $1\frac{3}{4}$ | 50,000 | $6\frac{3}{4}$ | 5 | – |
| 2 | 72,000 | $7\frac{3}{4}$ | 6 | – |
| $2\frac{1}{2}$ | 128,000 | $9\frac{3}{8}$ | 8 | 100 |

The load must be applied by a spherical bearing.

Fig. 3306

Fig. 3307: with Extension Piece

Hydraulic Snubber

Size Range: Eight standard sizes with load ratings from 350 to 120,000 pounds.

Finish: Basic unit is corrosion resistant salt bath nitrided. Attachments are painted with semi gloss primer, carbon zinc or other.

Service: 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.

Use with standard settings to prevent destructive response 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.

Standard Settings: The standard settings are:

Locking (activation) velocity 8 ± 2 in./min. Bleed rate (post activation) at normal rated load 4 ± 1 in./min.

(Special settings are available). The valves are calibrated at the factory within the tolerances indicated at room temperature.

Locking velocity and bleed rate will vary with temperature. Testing has indicated that there is little effect of these changes on dynamic operation.

Features:

- Temperature compensating valves minimize the effects of temperature on lockup and bleed.
- Pressurized reservoirs
- Continuous operation at 150° F with brief transients to 340° F
- Factory calibrated valves
- Rapid, positive valve closure
- Special design minimizes the “lost motion” which results from the shifting and seating of piston seals.
- Unlocked resisting force is less than $17 \frac{1}{2}$ pounds for sizes $\frac{1}{4}$ and $\frac{1}{2}$ and less than 2% of rated load for larger sizes.
- Stable non-flammable, long life hydraulic fluid
- Self-aligning bushings permit $\pm 5^\circ$ misalignment or angular motion. Bushings are coated with a dry lubricant.
- Choice of coating (paint, primer, carbo zinc, epoxy, plating or other) for attachments.

Applications:

- Direct replacement for Fig. 306/307 Pacific Scientific (PSA) mechanical snubbers: Exact load ratings, exact pin sizes, exact stroke lengths and exact pin-to-pin dimensions. The cross sectional dimensions of the Fig. 3306 are based on those of PSA to facilitate non-interference one-to-one replacement. Pins, clamps, pivot mounts, extension pieces, and rear brackets used with PSA snubbers are compatible with the Fig. 3306 and can be utilized.
- New installations: For new installations, the Fig. 3306 is available with a complete line of pipe clamps and rear brackets.



Fig. 3306



Fig. 3307 with Extension Piece

| LOADS (LBS) | | |
|---------------|---------------------|------------|
| Size | Stroke (in) | Max Load * |
| $\frac{1}{4}$ | 4 | 350 |
| $\frac{1}{2}$ | 2 $\frac{1}{2}$, 4 | 650 |
| 1 | 4, 8 | 1,500 |
| 3 | 5, 10 | 6,000 |
| 10 | 6, 12 | 15,000 |
| 32 | 5 | 32,000 |
| 35 | 6, 18 | 50,000 |
| 100 | 6 | 120,000 |

* Loads must not be applied outside a 10° included angle cone of action to the pipe clamp axis without special authorization.

Fig. 3306 Fig. 3307: with Extension Piece

Hydraulic Snubber

How to size:

- (1) **Size:** Use table on the previous page to select size large enough to restrain expected load.
- (2) **Stroke:** Define expected movement of the pivot joining the snubber with the equipment to be protected (cold to hot plus any abnormal movements). Determine maximum and minimum distances between this curve and the fixed pivot pin of the snubber. The minimum recommended stroke is 20% greater than the difference between these lengths. Make sure that all normal movement of equipment will be accommodated without the snubber entering the last $\frac{1}{4}$ " (preferably $\frac{1}{2}$ ") of the stroke at either end.

Note: If erected position at the snubber's location on the equipment is outside of the range of normal cold-to-hot movement (e.g cold pull of pipe), the snubber should not be installed until after the equipment is in its cold position. This eliminates the need of providing for the extra travel in the snubber's stroke.

- (3) **Piston position:** To aid in measuring the piston position, we have shown a dimension, "Z". This dimension represents the distance between the cylinder head and the end of the rod when the rod is fully retracted. Whenever specifying the position at which the piston rod is to be set, the total dimension from the cylinder head to the end of the rod should be given. Thus, $piston\ setting = piston\ position + Z$.
- (4) **Assembly length:** Determine the installed "C" dimension by adding the installed piston position (not setting) to C minimum. Lay in takeout dimensions E and/or B, and find required pin-to-pin snubber length. If a pin-to-pin length adjustment is desired, use Fig. 3307. Calculate the required "W" dimension by subtracting (C installed + F) from the required pin-to-pin length. If this is less than W minimum, only a Fig. 3306 can be used, and one of the attachments will have to be moved or shimmed to suit. If a Fig. 3306 is to be used, make sure that the required pin-to-pin length is at least as great as (C installed + B). If neither a Fig. 3306 nor a Fig. 3307 can be accommodated, and the installation cannot be modified, consult your Anvil representative about designing a special or modified unit.
- (5) **Installed piston setting:** As indicated previously, the snubber should be installed at its cold piston position if possible. From the installed position, take extension (outward movement) of the piston rod as positive (+) and retraction as negative (-).
Installed piston position =

$$\left(\frac{\text{Stroke} - (\text{Algebraic Sum of Movements})}{2} \right)$$

Ordering: Specify

- Fig. No.
- Size
- Stroke
- Load
- Cold and hot piston settings
- W dimension when specifying Fig. 3307
- Pipe clamp size when specifying option 3
- Attachment surface coating
- Option

| FIG. 3306 & 3307 OPTIONS | |
|--------------------------|---|
| Option | Consists of... |
| 0 | Fig 3306: Basic unit (snubber) with pivot mount and one rear bracket. Fig. 3307: Basic unit with extension piece and one rear bracket. |
| 1 | Option 0 plus cylinder eye. |
| 2 | Option 0 plus cylinder eye and additional rear bracket. |
| 3 | Option 0 plus cylinder eye and pipe clamp. |



Fig. 3306

Hydraulic Shock and Sway Suppressor (cont.)

Fig. 3307: with Extension Piece

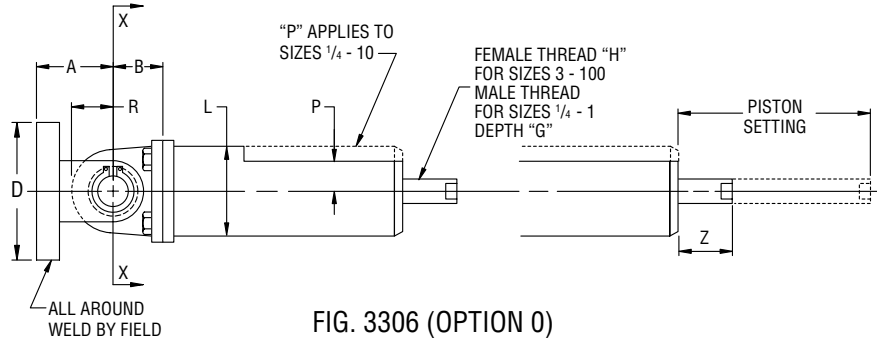


FIG. 3306 (OPTION 0)

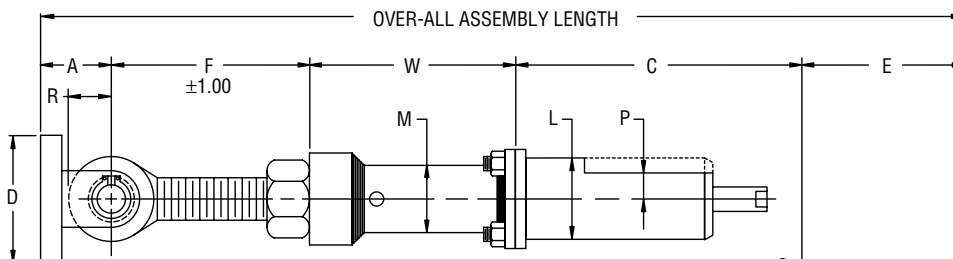
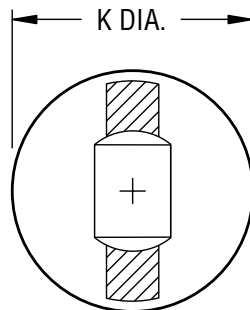
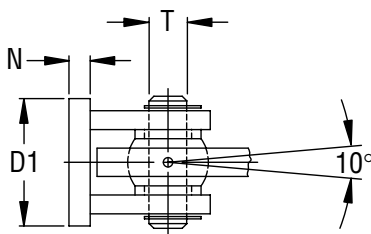


FIG. 3307 (OPTION 0)



BOLT PLATE (SIZES 1/4 - 10)
SECTION X-X

NOTE: CYLINDER EYE MAY BE ROTATED TO ANY POSITION

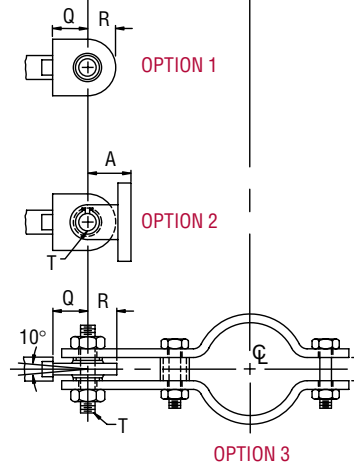


Fig. 3306

Hydraulic Snubber (cont.)

Fig. 3307: with Extension Piece

| FIG 3306, 3307 DIMENSIONS (IN) | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------------------|--------|------|-------|-------|-------|-------|------|------|------|------|----------|-------|-------|-----------|------|------|-------|-------|------|----------------|-------|-------|----------------|------|
| Snubber Size | Stroke | A | B | C * | | | D | D1 | F | G | H | K Dia | L Dia | M Dia | N | P | Q Ref | R Max | S | T Dia | W | | Max Pin to Pin | Z |
| | | | | Min | Mid | Max | | | | | | | | | | | | | | | Min | Max | | |
| ¼ | 4.00 | 1.00 | 1.19 | 9.0 | 11.00 | 13.0 | 2.00 | 1.25 | 2.94 | 0.38 | ¾-16-2A | 2.25 | 2.25 | 1.31 | 0.25 | 0.62 | 1.19 | 0.63 | 0.63 | 0.374 0.372 | 3.50 | 45.56 | 61.50 | 0.19 |
| ½ | 2.50 | | | 7.5 | 8.75 | 10.0 | | | | | | | | | | | | | | | 3.50 | 48.56 | | |
| | 4.00 | 9.0 | 11.00 | 13.0 | 3.50 | 45.56 | | | | | | | | | | | | | | | | | | |
| 1 | 4.00 | 1.62 | 1.56 | 11.0 | 13.00 | 15.0 | 4.00 | 1.75 | 3.00 | 0.38 | ¾-16-2A | 3.25 | 2.38 | 1.31 | 0.38 | 0.69 | 2.00 | 1.00 | 1.00 | 0.499 0.497 | 3.81 | 43.50 | 61.50 | 0.19 |
| | 8.00 | | | 15.5 | 19.50 | 23.5 | | | | | | | | | | | | | | | N/A | N/A | 25.06 | 0.13 |
| 3 | 5.00 | 2.12 | 2.50 | 14.0 | 16.50 | 19.0 | 5.00 | 3.62 | 4.50 | 0.75 | ⅝-18-2B | 4.62 | 4.62 | 2.38 | 0.50 | 1.44 | 2.12 | 1.38 | 1.38 | 0.749 0.747 | 4.44 | 37.50 | 61.00 | 1.25 |
| | 10.00 | | | 20.0 | 25.00 | 30.0 | | | | | | | | | | | | | | | N/A | N/A | 32.62 | 2.25 |
| 10 | 6.00 | 3.00 | 3.40 | 16.1 | 19.10 | 22.1 | 7.00 | 4.00 | 5.12 | 1.00 | ⅞-14-2B | 5.75 | 5.75 | 2.88 | 1.00 | 1.62 | 2.00 | 1.62 | 1.38 | 0.999 0.997 | 5.19 | 44.50 | 71.72 | 2.10 |
| | 12.00 | | | 23.1 | 29.10 | 35.1 | | | | | | | | | | | | | | | N/A | N/A | 39.16 | 1.00 |
| 32 | 5.00 | 4.00 | 2.50 | 20.75 | 23.25 | 25.75 | 6.12 | 4.25 | - | 1.62 | 1½-12-2B | - | 5.00 | 3.50 | 1.25 | - | 3.38 | 2.50 | 2.00 | 1.499 1.497 | - | - | - | 1.00 |
| 35 | 6.00 | 4.62 | 3.00 | 24.0 | 27.00 | 30.0 | 9.75 | 6.50 | 7.75 | 1.88 | 1⅞-12-2B | - | 6.00 | 4.50 - | 1.25 | - | 3.00 | 2.79 | 2.00 | 1.499 1.497 | 5.25 | 79.75 | 117.50 | 1.48 |
| | 18.00 | | | 36.0 | 45.0 | 54.0 | | | | | | | | | | | | | | | 14.63 | 55.75 | 117.80 | |
| 100 | 6.00 | 7.25 | 3.80 | 29.0 | 32.00 | 35.0 | 14.0 | 8.75 | 8.31 | 3.00 | 3-12-2B | - | 10.00 | 5.56 | 2.00 | - | 3.80 | 3.44 | - | 2.499 2.447 | 6.50 | 74.19 | 117.50 | 3.38 |

* Adapters are available to match existing pin-to-pins.

| FIG 3306, 3307 DIMENSIONS (IN) | | | | | | |
|--------------------------------|--------------|-----|-----|-----|-----|-----|
| *Pipe Size | E-Take Out | | | | | |
| | Snubber Size | | | | | |
| | ¼ & ½ | 1 | 3 | 10 | 32 | 35 |
| ¾ | 2⅞ | - | - | - | - | - |
| 1 | 2⅞ | - | - | - | - | - |
| 1¼ | 2⅞ | - | - | - | - | - |
| 1½ | 4⅞ | - | - | - | - | - |
| 2 | 5⅞ | - | - | - | - | - |
| 2½ | 5⅞ | 7 | 7 | 7 | - | - |
| 3 | 5⅞ | 7 | 7 | 8⅞ | - | - |
| 3½ | 6⅞ | 7 | 7 | 8⅞ | - | - |
| 4 | 6½ | 7¼ | 7¼ | 8⅞ | - | - |
| 5 | 7¼ | 7¾ | 7¾ | 9⅞ | 10 | - |
| 6 | 8⅞ | 8⅞ | 8⅞ | 10 | 10 | - |
| 8 | 9⅞ | 9⅞ | 9⅞ | 11¼ | 11¼ | 12⅞ |
| 10 | 10½ | 10½ | 10½ | 12¼ | 12¼ | 14¼ |
| 12 | - | 11⅞ | 11⅞ | 13⅞ | 13⅞ | 15⅞ |
| 14 | - | 12⅞ | 12⅞ | 14½ | 14½ | 16 |
| 16 | - | 13⅞ | 13⅞ | 15¼ | 15¼ | 17⅞ |
| 18 | - | 14⅞ | 14⅞ | 16⅞ | 16⅞ | 18¼ |
| 20 | - | 15¾ | 15¾ | 17¼ | 17¼ | 19¼ |
| 24 | - | 18⅞ | 18⅞ | 19⅞ | 19⅞ | 21¼ |
| 30 | - | 21¼ | 21¼ | 23 | 23 | 25 |
| 36 | - | 24 | 24 | 26½ | 26½ | 28⅞ |

* Intermediate sizes between 20 and 36 are available and will have the take out and stock of the next larger size.

Note: "E" Dimensions are for carbon steel clamps only, with maximum insulation of 4" and temperature of 650°.



ANVIL SF-N

Dimethyl Diphenyl Polysiloxane Snubber Fluid
Certified viscosity stability to 200mRad
Certified 5 year shelf life



ALSO SEE ANVIL SNUBBER
Fig. 3306N

What Dimethyl Diphenyl Polysiloxane does, **Anvil SF-N certifies.**

When you need Dimethyl Diphenyl Polysiloxane hydraulic snubber fluid, you don't have to say Dimethyl Diphenyl Polysiloxane anymore. Just say Anvil SF-N. When you ask for it by name you get Dimethyl Diphenyl Polysiloxane, the same fluid as SF1154[®]. Each batch of Anvil SF-N is independently tested and certified for viscosity stability at 40mRad (200mRad and other specialized requirements are available upon request). We wanted to make your life easier and we have. Only from Anvil, the world's largest and most complete manufacturer of pipe hangers, supports and fittings—where we have built our reputation on 150 years of proven excellence. **For the best in hydraulic snubber technology, hang with Anvil.**

Fig. 38 SD

Half Clamp

This product is a special design per customer requirements. Contact Anvil Intl. for further information and how to order.

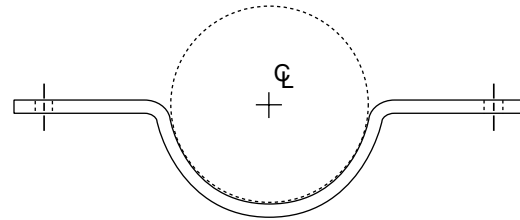


Fig. 40 SD

Riser Clamp

Material: Carbon steel chrome molybdenum or stainless steel.

Finish: Plain or Galvanized

Maximum Temperature: As required.

Ordering: Specify figure number 40SD, riser clamp special design, material, exact pipe size, load, operating temperature, insulation thickness, C-C dimension, rod diameter, finish and if connected to a spring or rigid connection.

Service: Riser clamps are used for the support of vertical piping. Load is carried by shear lugs which are welded to the pipe. Shear lugs not provided.

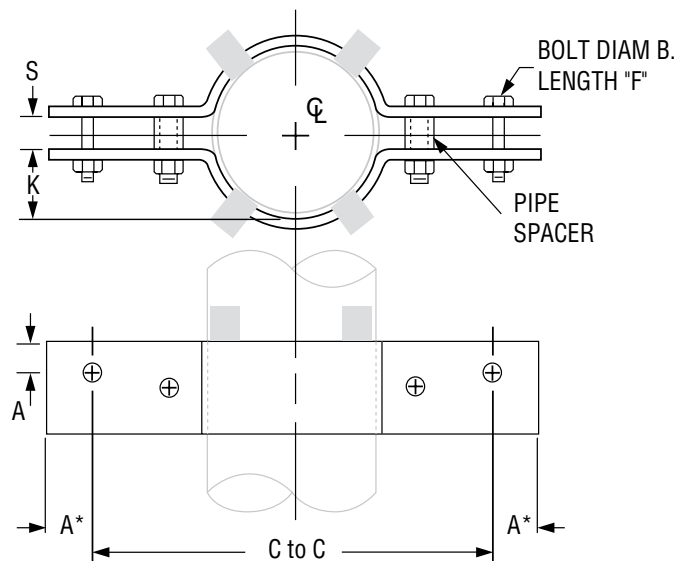


Fig. 41 SD

Non-Standard Three Bolt Pipe Clamp

Ordering:

Specify Fig. 41SD double bolt pipe clamp, material specification, pipe size, load, operating temperature, insulation thickness and finish.

Alloy clamps, unless otherwise specified, will be furnished with alloy studs made from ASTM A 193-B7 stud stock and ASTM A 194-Gr. 2H hex nuts.

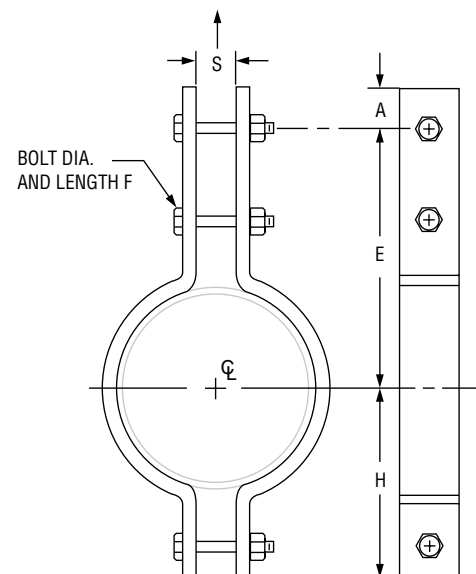


Fig. 42 SD

Non-Standard Two Bolt Pipe Clamp

Ordering:

Specify Fig. 42SD pipe clamp, material specification, pipe size, load, temperature and finish.

Alloy clamps, unless otherwise specified, will be furnished with alloy studs made from ASTM A 193-B7 stud stock and ASTM A 194-Gr. 2H hex nuts.

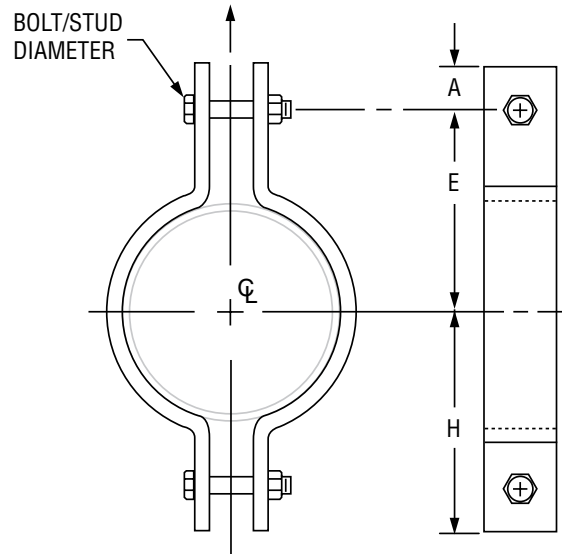


Fig. 53 SD

Welding Lug for L.R. Elbow

This product is a special design per customer requirements. Contact Anvil Intl. for further information and how to order sizes not shown. Local pipe wall stress should be evaluated.

| FIG. 53SD: DIMENSIONS (IN) | | | | | | | | |
|----------------------------|------------|--------------------------------|---|----|----|--------------------------------|---|--------------------------------|
| Pipe Size | Rod Size A | C Rod Take Out | T | D | R | H Max. Dia. | | |
| 2½ | ¾ | 7 ⁵ / ₁₆ | ½ | 3½ | 1½ | 1 ⁵ / ₁₆ | | |
| 3 | | 7 ⁷ / ₁₆ | | | | | | |
| 3½ | 7/8 | 7½ | | | | 5 | 2 | 1 ¹ / ₁₆ |
| 4 | | 7 ⁹ / ₁₆ | | | | | | |
| 6 | | 7 ⁷ / ₁₆ | | | | | | |
| 8 | 1 | 7 ⁷ / ₁₆ | | | | 5/8 | 6 | 2½ |
| 10 | 1¼ | 7 ⁵ / ₁₆ | ¾ | 7 | 3 | 1¾ | | |
| 12 | 1½ | 7 ⁷ / ₈ | | | | | | |

* Based on maximum 4" insulation.

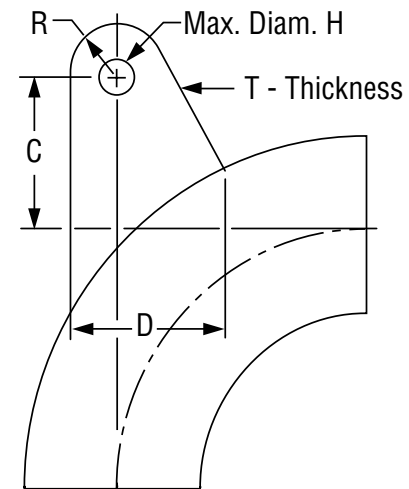
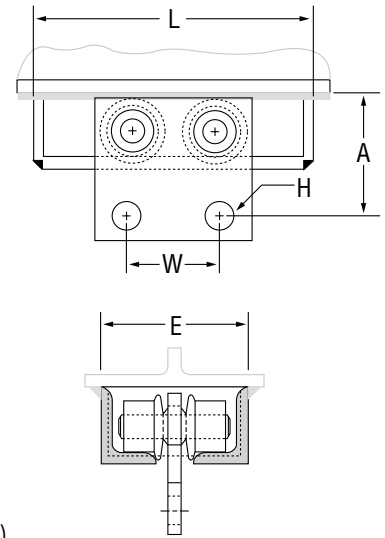


Fig. 71 SD

Double Roll Horizontal Traveler

This product is a special design per customer requirements. Contact Anvil Intl. for further information and how to order.

The Anvil Fig. 71SD horizontal traveler facilitates the supporting of piping systems subject to linear horizontal movements where head room is limited. Designed for use with Anvil Variable Spring Hangers or Constant Supports it can also be used in conjunction with a rigid type hanger assembly.



| FIG. 71SD: DIMENSIONS (IN) • LOADS (LBS) | | | | | | |
|--|--------------|-------------------------------|-------------------------------|-------------------------------|--------------------------------|---|
| Size | Maximum Load | A Min | E | H Max | L | W |
| 1 | 10,700 | 4 ³ / ₄ | 5 ⁵ / ₈ | 1 ¹ / ₈ | 19 ¹ / ₄ | 3 |
| 2 | 17,800 | 6 | 7 | 1 ³ / ₄ | 23 ¹ / ₄ | 5 |
| 3 | 33,200 | 8 | 8 ³ / ₈ | 2 ⁵ / ₈ | 25 ¹ / ₄ | 6 |

Provides 12" Horizontal Travel

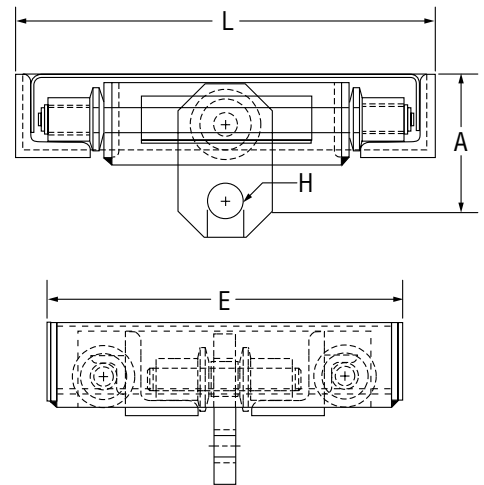
Ordering: Specify size number, Figure 71SD, and H = (Refer to constant support size and tables.)

Fig. 72 SD

Dual Direction Horizontal Traveler

This product is a special design per customer requirements. Contact Anvil International for further information and how to order.

The Anvil Fig. 72SD Horizontal Traveler facilitates the supporting of piping systems subject to dual directional horizontal movements where head room is limited. Designed for use with Anvil Variable Spring Hangers or Constant Supports, it can also be used in conjunction with a rigid type hanger assembly.



| FIG. 72SD: DIMENSIONS (IN) • LOADS (LBS) | | | | | |
|--|--------------|--------------------------------|--------------------------------|-------------------------------|--------------------------------|
| Size | Maximum Load | A Min | E | H Max | L |
| 1 | 5,385 | 4 ³ / ₈ | 20 ⁷ / ₈ | 1 ¹ / ₈ | 19 |
| 2 | 8,900 | 6 ³ / ₈ | 24 ¹ / ₂ | 1 ³ / ₈ | 22 ¹ / ₂ |
| 3 | 16,600 | 8 ⁷ / ₈ | 26 ⁷ / ₈ | 1 ³ / ₄ | 24 ⁷ / ₈ |
| 4 | 29,670 | 10 ³ / ₄ | 29 ⁵ / ₈ | 2 ³ / ₈ | 27 ¹ / ₈ |

All sizes provide 12" Horizontal Travel

Ordering: Specify size number, Figure 72SD, and H = (Refer to constant support size and tables.)

Fig. 75 SD

Flat Roller With Saddle

This product is a special design per customer requirements. Contact Anvil International for further information and how to order.

Note: Type B Saddle - If attached to alloy pipe, furnish material specification applicable to the pipe. (Alloy Bars furnished for attachment to alloy pipe only.)

Contact Anvil EPS for: non-standard dimensions, loads larger than specified, special designs and non-conductive rollers.

| FIG. 75SD: DIMENSIONS (IN) • LOADS (LBS) | | | | | |
|--|------------------|--------|--------|-------|-------|
| Pipe Size | Recommended Load | A | | L | W |
| | | Type A | Type B | | |
| 4 | 2,380 | 6.19 | 7.38 | 6.00 | 5.00 |
| 5 | | 6.81 | 8.00 | | |
| 6 | | 7.44 | 5.56 | | |
| 8 | 5,680 | 10.88 | 13.31 | 9.50 | 8.00 |
| 10 | | 12.25 | 14.62 | | |
| 12 | | 13.38 | 15.75 | | |
| 14 | 9,240 | 14.62 | 17.88 | 12.00 | 8.00 |
| 16 | | 15.75 | 19.06 | | |
| 18 | | 16.88 | 20.19 | | |
| 20 | 12,610 | 17.81 | 22.00 | 17.00 | 10.00 |
| 22 | | 19.06 | 23.19 | | |
| 24 | | 20.19 | 24.38 | | |
| 26 | | 21.38 | 25.50 | | |
| 28 | 17,620 | 23.44 | 27.62 | 23.00 | 12.00 |
| 30 | | 24.69 | 25.88 | | |
| 32 | | 25.88 | 30.12 | | |
| 34 | | 27.00 | 31.25 | | |
| 36 | | 28.19 | 32.38 | | |
| 42 | | 31.56 | 35.75 | | |

For temperatures exceeding 650°, use Type B.

Ordering: Specify pipe size and Figure 75SD.

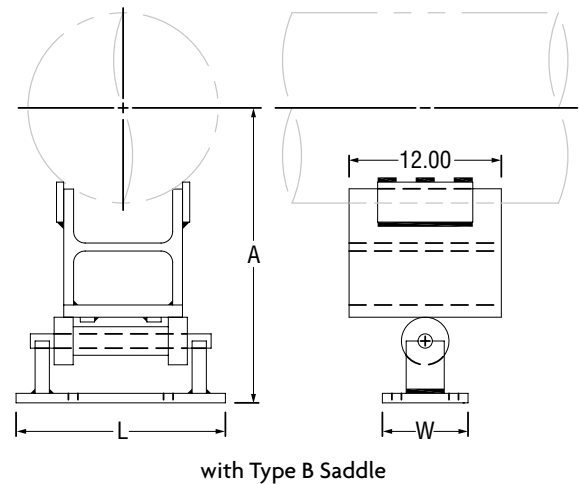
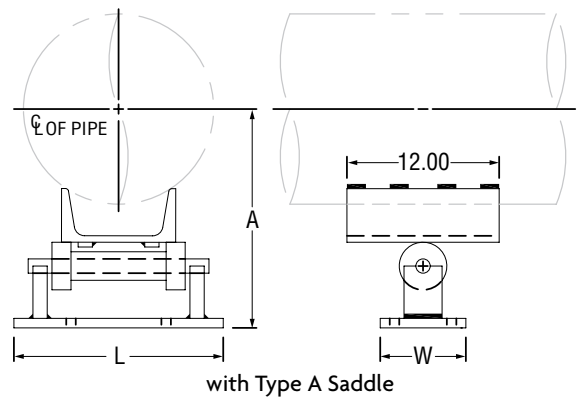


Fig. 76 SD

Fabricated Roller for Large Diameter Pipe

This product is a special design per customer requirements. Contact Anvil International for further information and how to order.

Installation: The two piece fabricated roller is designed for one of the two rollers on each side of the assembly to be in contact with the pipe.

| FIG. 76SD: DIMENSIONS (IN) • LOADS (LBS) | | | | | | |
|--|----------|----------------------------------|--------------------------------|----------------------------------|----------------------------------|---------------------------------|
| Steel Pipe Size | Max Load | A | B | C | D | E |
| 30 | 60,000 | 23 ³ / ₁₆ | 13 ⁵ / ₈ | 8 ³ / ₁₆ | 8 ¹⁵ / ₁₆ | 0 |
| 36 | | 26 | | | 9 ¹⁵ / ₁₆ | 1 |
| 42 | | 28 ⁷ / ₈ | | | 10 ¹⁵ / ₁₆ | 2 |
| 46 | | 30 ³ / ₄ | | | 11 ¹¹ / ₁₆ | 2 ³ / ₄ |
| 46 | 60,000 | 31 ³ / ₁₆ | 16 ¹ / ₄ | 10 ¹³ / ₁₆ | 13 | 1 ⁷ / ₁₆ |
| 48 | | 32 ¹ / ₁₆ | | | 13 ⁷ / ₁₆ | 1 ³ / ₄ |
| 54 | | 34 ¹⁵ / ₁₆ | | | 14 ¹ / ₂ | 2 ¹⁵ / ₁₆ |
| 60 | | 37 ¹¹ / ₁₆ | | | 15 ¹¹ / ₁₆ | 4 ¹ / ₈ |
| 66 | | 40 ⁹ / ₁₆ | | | 16 ³ / ₄ | 5 ³ / ₁₆ |
| 72 | | 43 ³ / ₈ | | | 17 ¹³ / ₁₆ | 6 ¹ / ₄ |

| FIG. 76SD: DIMENSIONS (IN) • LOADS (LBS) | | | | | | |
|--|----------|---------------------------------|--------------------------------|----------------------------------|--------------------------------|--------------------------------|
| C.I./D.I. Pipe Size | Max Load | A | B | C | D | E |
| 30 | 60,000 | 24 ³ / ₁₆ | 13 ⁵ / ₈ | 8 ³ / ₁₆ | 9 ¹ / ₄ | 7 ¹ / ₁₆ |
| 36 | | 27 ³ / ₁₆ | | | 10 ³ / ₈ | 1 ⁹ / ₁₆ |
| 42 | | 30 ¹ / ₈ | | | 11 ¹ / ₂ | 2 ⁹ / ₁₆ |
| 48 | 60,000 | 33 ¹ / ₂ | 16 ¹ / ₄ | 10 ¹³ / ₁₆ | 13 ³ / ₄ | 2 ³ / ₁₆ |

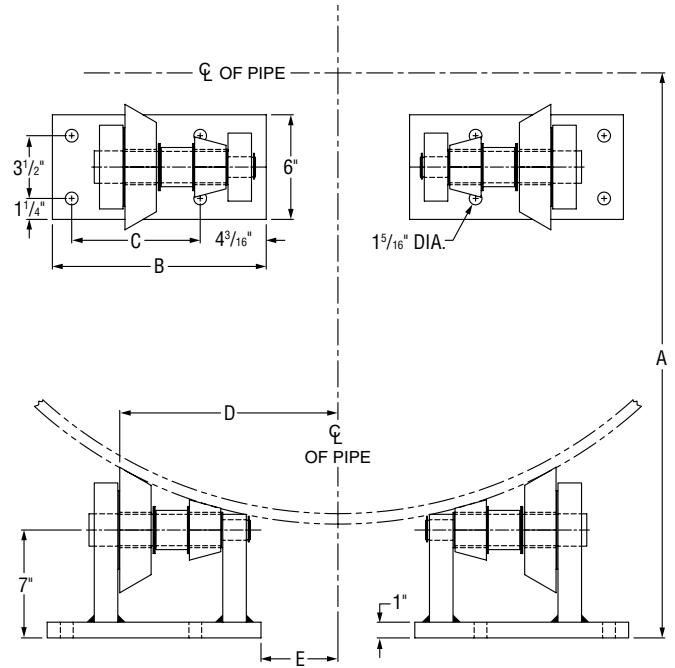


Fig. 170

Horizontal Traveler

Size Range: Available in four sizes to take loads to 20,700 (lbs). All sizes provide for 12" of horizontal travel.

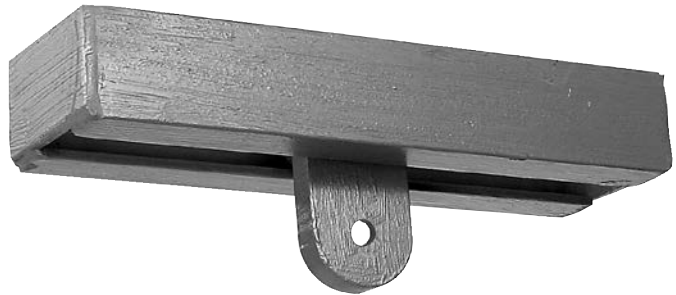
Approvals: Complies with ANSI/MSS SP-69 and MSS SP-58 (Type 58).

Features:

- Highly economical
- Minimum friction
- Virtually dust proof
- Compact – designed for minimum head room
- Versatile

Installation: Shipped ready for installation. Attach to the supporting steel by welding around the frame.

Ordering: Specify size number, figure number, name and "H" dimension, if required. Horizontal travelers will be designed for special loads, travels or dual directional travel upon request.



The Anvil Fig. 170 horizontal traveler facilitates the supporting of piping systems subject to linear horizontal movements where head room is limited. Designed for use with Anvil Variable Spring Hangers or Constant Supports it can also be used in conjunction with a rigid type hanger assembly. Refer to Fig. 71SD and 72SD for additional horizontal traveler designs.

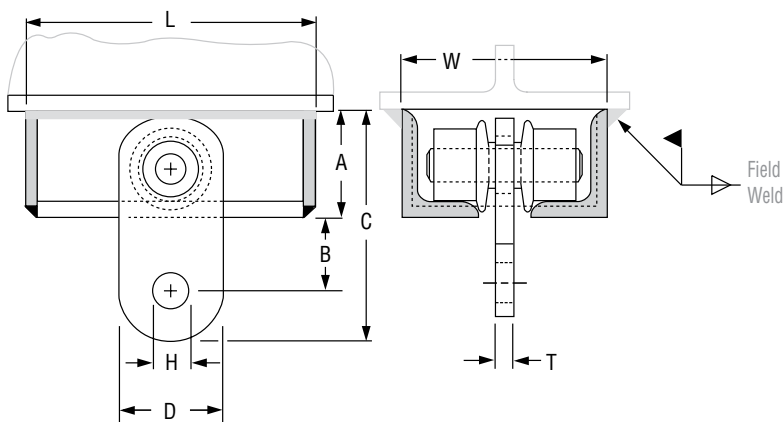


FIG. 170: DIMENSIONS (IN) • LOADS (LBS) • WEIGHTS (LBS)

| Size | Maximum Load | Weight | A | B | C | D | H Max | L | T | W |
|------|--------------|--------|----|----|-----|----|-------|-----|----|----|
| 1 | 3,770 | 15 | 2½ | 1⅝ | 5⅜ | 2½ | 1⅝ | 15⅝ | ¾ | 4⅝ |
| 2 | 6,230 | 37 | 3½ | 2⅝ | 7⅞ | 3½ | 1⅜ | 16⅜ | | 6⅞ |
| 3 | 11,630 | 69 | 5 | 3 | 10½ | 5 | 1¾ | 17⅞ | 1 | 8⅞ |
| 4 | 20,700 | 102 | 6 | 3½ | 12½ | 6 | 2⅝ | 19⅞ | 1½ | 9⅞ |

Fig. AF001 (Formerly Anvil Fig. 770 & Afcon Fig. 001/020) Q Brace Clamp

Size Range: Service Pipe: 1" through 6", DN25 through DN100
 Brace Pipe: 1", 1 1/4", DN25 and DN32

Material: Carbon steel

Finish: Plain or Electro-Galvanized per ASTM B633

Service: Designed to rigidly brace and restrain piping systems subjected to lateral seismic loads. May also be installed to brace piping systems subjected to vertical seismic loads. For vertical load capacities, reference OSHPD OPM-0351-13.

Approvals: cULus Listed (UL 203a) and FM Approved (FM 1950-10 & FM 1950-13). OSHPD Pre-Approved (OPM-0351-13 and OPA-2804-10). Complies with the hanging and bracing requirements listed in NFPA 13.

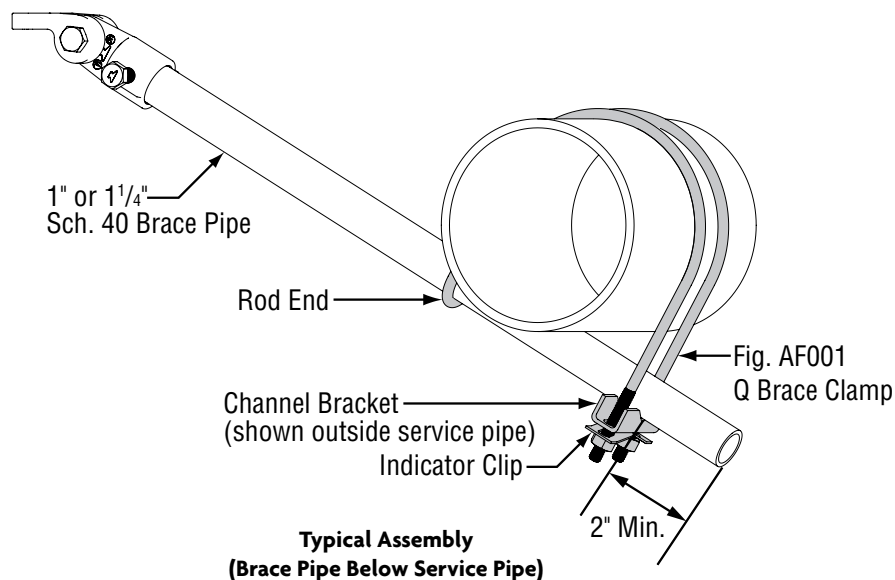
Features:

- Field adjustable design requires no threading of the brace pipe
- Indicator clip provides a visual indication that the desired torque value has been achieved

Installation Instructions:

- Place the 3/8" diameter threaded rod hoop over the service pipe and slide the Sch. 40 brace pipe through the open ends of the threaded rod hoop. The end of the brace pipe must extend at least 2" past the channel bracket.
- Note: The brace pipe may be installed above or below the service pipe.
- Ensure brace pipe is set to the desired installation brace angle.
- Torque hex nuts alternately and equally to the listed torque. Ensure the indicator clip is completely flattened and the brace pipe is tight against the service pipe.
- For riser/4-way brace installations, two Q Brace clamps must be installed within 6" of each other.
- Fire Protection applications shall also be installed per the requirements of NFPA 13 and local codes.

Ordering: Specify service pipe size, brace pipe size, figure number, finish and description.

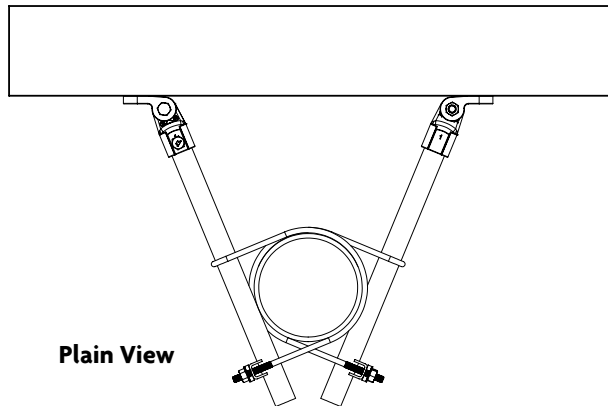


Notes: Anvil International® brand bracing components are designed to be compatible ONLY with other Anvil International® brand bracing components, resulting in a Listed seismic bracing assembly. Updated UL listing information may be viewed at www.ul.com and updated FM approval information may be viewed at www.approvalguide.com.

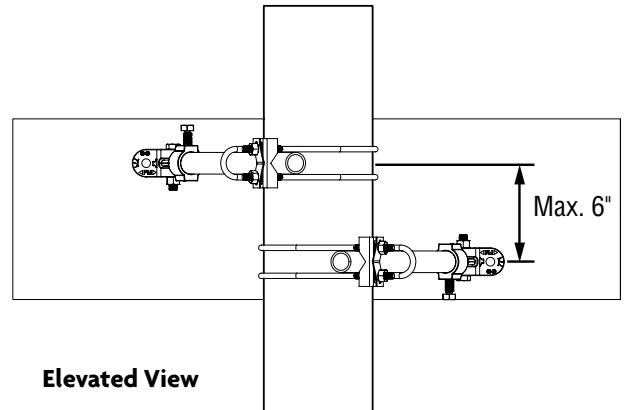
Disclaimer: Anvil International ("Anvil") does not provide any warranties and specifically disclaims any liability whatsoever with respect to Anvil bracing products and components that are used in combination with products, parts or systems not manufactured or sold by Anvil. In no event shall Anvil be liable for any incidental, direct, consequential, special or indirect damages or lost profits where non-Anvil bracing components have been, or are used.

SeisBrace® Seismic Fire Protection Design Tool may be accessed at www.seisbrace.com

Fig. AF001 (Formerly Anvil Fig. 770 & Afcon Fig. 001/020) Q Brace Clamp (cont.)



Plain View



Elevated View

Riser/4-Way Brace Assembly

| FIG. AF001 cULus & FM INSTALLATION TORQUE: DIMENSIONS (IN) • TORQUE (FT•LBS) • WEIGHT (LBS) | | | |
|--|---------------------|------------------------------|----------------------------------|
| Service Pipe Size | Installation Torque | 1"/DN25 Brace Pipe Weight | 1 1/4"/DN32 Brace Pipe Weight |
| 1 (DN25) | 14 | 0.82 | 0.87 |
| 1 1/4 (DN32) | | 0.86 | 0.90 |
| 1 1/2 (DN40) | | 0.90 | 0.95 |
| 2 (DN50) | 16 | 0.96 | 1.00 |
| 2 1/2 | | 1.02 | 1.06 |
| DN65 | | 1.05 | 1.09 |
| 3 (DN80) | 17 | 1.09 | 1.13 |
| 4 (DN100) | | 1.23 | 1.26 |
| 5 | | 1.32 | 1.36 |
| 6 | | 1.49 | 1.53 |

| FIG. AF001 cULus MAX SEISMIC LATERAL LOADS: DIMENSIONS (IN) • LOADS (LBS) | | | | |
|--|----------------------------|------------------------|-------------|----------------------------|
| Service Pipe Size | Brace Pipe Size | Max Seismic Brace Load | | Max Seismic Restraint Load |
| | | Schedule 10 | Schedule 40 | |
| 1 (DN25) | 1 - 1 1/4 (DN25 - DN32) | - | - | 1000 |
| 1 1/4 - 2 (DN32 - DN50) | | 1000 | 1000 | |
| 2 1/2 - 4 (DN65 - DN100) | | 1600 | 1600 | - |
| 5 | | | | |
| 6 | | | | |

NPS Brace Pipe Dimensions per ASTM A53 Sch. 40, ASTM A106 Sch. 40, or equivalent.
 NPS Service Pipe Dimensions per ASTM A53, ASTM A106 or equivalent.
 DN Service Pipe Dimensions per KS D 3507/3537 or equivalent listed with Sch. 10 Loads.
 DN Service Pipe Dimensions per KS D 3562 Sch. 40 or equivalent listed with Sch. 40 Loads.
 DN Brace Pipe Dimensions per KS D 3562 Sch. 40 or equivalent.

| FIG. AF001 FM MAX SEISMIC LATERAL ASD LOADS***: DIMENSIONS (IN) • LOADS (LBS) • ANGLES (DEGREES) | | | | | | |
|---|--------------------------|---------------|--|---------|---------|---------|
| Service Pipe Size | Brace Pipe Size | Pipe Schedule | Max Seismic Brace Load at Brace Pipe Angle** | | | |
| | | | 30 - 44 | 45 - 59 | 60 - 74 | 75 - 90 |
| 1 - 3 (DN25-DN80) | 1 - 1 1/4 (DN25-DN32) | LW* | 250 | 360 | 440 | 500 |
| | | Schedule 10 | 570 | 810 | 1000 | 1100 |
| | | Schedule 40 | | | | |
| 4 - 5 (DN100) | | LW* | 410 | 590 | 720 | 800 |
| | | Schedule 10 | 760 | 1070 | 1320 | 1470 |
| | | Schedule 40 | | | | |
| 6 | LW* | 250 | 360 | 440 | 500 | |
| | Schedule 10 | 770 | 1090 | 1340 | 1490 | |
| | Schedule 40 | | | | | |

NPS Brace Pipe Dimensions per ASTM A53 Sch. 40, ASTM A106 Sch. 40, or equivalent.
 NPS Service Pipe Dimensions per ASTM A53, ASTM A106 or equivalent.
 DN Service Pipe Dimensions per EN 10220, GB/T 8163, or equivalent listed with LW loads.
 DN Service Pipe Dimensions per GB/T 3091, GB/T 3092, EN10255M, EN10255H, KS D 3507/3537, or equivalent listed with Sch. 10 loads.
 DN Service Pipe Dimensions per JIS G3452, KS D 3562 Sch 40 or Equivalent listed with Sch. 40 loads.
 DN Brace Pipe Dimensions per GB/T 3091, EN10255H, JIS G3454 Sch. 40, KS D 3562 Sch. 40, or equivalent.
 * Load Rating for LW above refers to FM Approved Lightwall pipe, commonly referred to as Sch. 7 and Flow Pipe. See FM Approval Guide for approved Lightwall pipe.
 ** Brace Pipe Angles are determined from vertical.
 *** The allowable FM approved capacity of brace subassemblies are listed in Allowable Stress Design (ASD). For Load Resistance Factor Design (LRFD) capacities, the above values will need to be multiplied by 1.5.

Fig. AF035 (Formerly Afcon Fig. 035)

Model K Brace Clamp

Size Range: Carbon Steel Service Pipe: 1" through 12", DN25 through DN200
 CPVC Steel Service Pipe: 1" through 3"
 Brace Pipe: 1" through 2" and DN25 through DN50

Material: Carbon Steel Strap and Ductile Iron Cast Hoop Ends

Finish: Plain or Electro-Galvanized per ASTM B633

Service: Designed to rigidly brace piping systems subjected to lateral seismic loads.

Approvals: cULus Listed (UL 203a) and FM Approved (FM 1950-10 & FM 1950-13). Complies with the hanging and bracing requirements listed in NFPA 13.

Features:

- Unique design provides solutions for carbon steel and CPVC pipe.
- Beveled edge design helps protect the CPVC pipe from any rough surface and eliminates pipe abrasion.
- Large installation hole in the cast hoop ends allows the brace pipe to pass through easily without interference.
- Visual indication of proper assembly when the head of the set screw bottoms out on the cast hoop ends.

Installation Instructions:

- Place the Model K Brace Clamp over the service pipe to be braced and slide the Sch. 40 brace pipe through the cast hoop ends. The end of the brace pipe must extend at least 1" past the cast hoop ends.
- Note: The brace pipe may be installed above or below the service pipe.
- Ensure brace pipe is set to the desired installation brace angle.
- Torque the set screws alternately and equally until the head of the set screw bottoms out on the cast hoop ends.
- For riser/4-way brace installations, two Model K Brace Clamps must be installed within 6" of each other.
- For CPVC installation, ensure the legs of the Model K Brace Clamp strap are parallel to each other and perpendicular to the brace pipe prior to installation.
- Fire Protection applications shall also be installed per the requirements of NFPA 13 and local codes.

Patents: No. 7,516,922, No. 7,523,895

Ordering: Specify service pipe size, brace pipe size, figure number, finish and description.

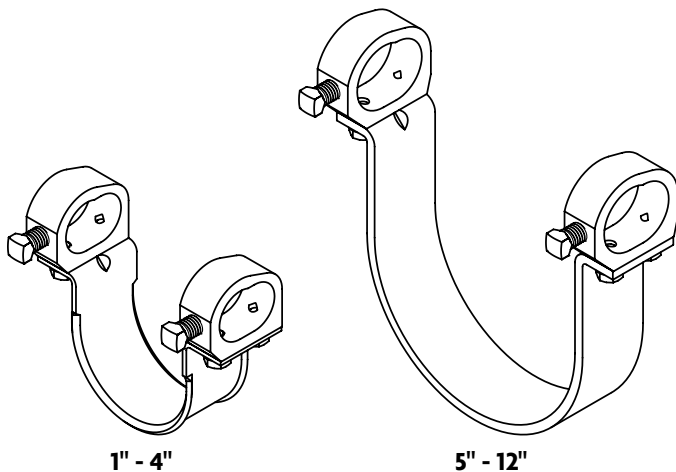


FIG. AF035: DIMENSIONS (IN) • WEIGHT (LBS)

| Service Pipe Size | 1"/DN25 Brace Pipe Weight | 1 1/4"/DN32 Brace Pipe Weight | 1 1/2"/DN40 Brace Pipe Weight | 2"/DN50 Brace Pipe Weight |
|-------------------|---------------------------------|-------------------------------------|-------------------------------------|---------------------------------|
| 1 (DN25) | 1.60 | 1.80 | 2.00 | 2.28 |
| 1 1/4 (DN32) | 1.68 | 1.88 | 2.08 | 2.36 |
| 1 1/2 (DN40) | 1.64 | 1.84 | 2.04 | 2.32 |
| 2 (DN50) | 1.88 | 2.08 | 2.28 | 2.56 |
| 2 1/2 | 1.90 | 2.10 | 2.30 | 2.58 |
| DN65 | 2.00 | 2.20 | 2.40 | 2.68 |
| 3 (DN80) | 2.10 | 2.30 | 2.50 | 2.78 |
| 4 (DN100) | 2.20 | 2.40 | 2.60 | 2.88 |
| 5 (DN125) | 3.40 | 3.60 | 3.80 | 4.08 |
| DN150 | 3.80 | 4.00 | 4.20 | 4.48 |
| 6 | 3.90 | 4.10 | 4.30 | 4.58 |
| DN200 | 4.70 | 4.90 | 5.10 | 5.38 |
| 8 | 4.80 | 5.00 | 5.20 | 5.48 |
| 10 | 5.60 | 5.80 | 6.00 | 6.28 |
| 12 | - | 6.36 | 6.56 | 6.84 |

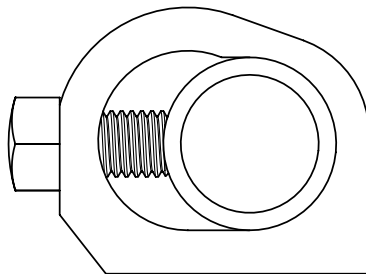
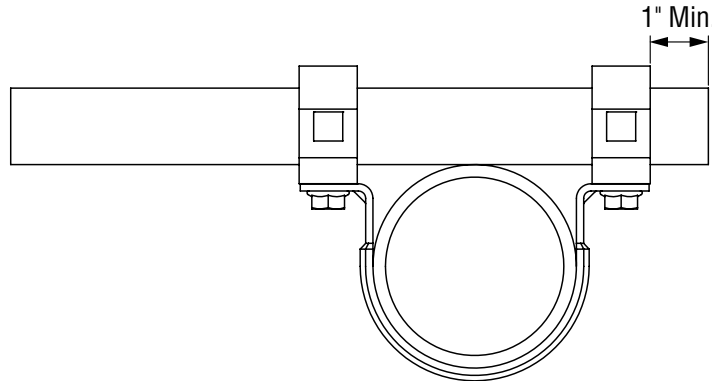
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Fig. AF035 (Formerly Afcon Fig. 035)

Model K Brace Clamp (cont.)



Set Screw Installation

**FIG. AF035 cULus MAX SEISMIC LATERAL LOADS:
DIMENSIONS (IN) • LOADS (LBS)**

| Service Pipe Size | Brace Pipe Size | Max Seismic Brace Load | | |
|---------------------------|------------------------|------------------------|-------------|-------------|
| | | Specialty* | Schedule 10 | Schedule 40 |
| 1 - 4 (DN25 - DN100) | 1 - 2 (DN25 - DN50) | 2765 | 2765 | 2765 |
| 5 - 10 (DN125 - DN200) | | - | | |
| 12 | 1 1/4 - 2 | | 3740 | 3740 |

NPS Brace Pipe Dimensions per ASTM A53 Sch. 40, ASTM A106 Sch. 40, or equivalent.
 NPS Service Pipe Dimensions per ASTM A53, ASTM A106 or equivalent.
 DN Service Pipe Dimensions per KS D 3507/3537 or equivalent listed with Sch. 10 loads.
 DN Service Pipe Dimensions per KS D 3562 Sch. 40 or Equivalent listed with Sch. 40 loads.
 DN Brace Pipe Dimensions per KS D 3562 Sch. 40 or equivalent.
 * Specialty pipes are commonly referred to as Sch. 7 and Flow Pipe. Please visit the UL listing on the UL website for a complete list of listed specialty pipes.

FIG. AF035 FM MAX SEISMIC LATERAL ASD LOADS*:
DIMENSIONS (IN) • LOADS (LBS) • ANGLES (DEGREES)**

| Service Pipe Size | Brace Pipe Size | Pipe Schedule | Max Seismic Brace Load at Brace Pipe Angle** | | | |
|----------------------------|------------------------|-------------------|--|---------|---------|---------|
| | | | 30 - 44 | 45 - 59 | 60 - 74 | 75 - 90 |
| 1 - 1 1/2 (DN25 - DN40) | 1 - 2 (DN25 - DN50) | LW* - Sch. 40 | 1680 | 2380 | 2920 | 3250 |
| 2 - 3 (DN50 - DN80) | | LW* - Sch. 40 | 1800 | 2550 | 3120 | 3490 |
| 4 (DN100) | | LW* - Sch. 40 | 1370 | 1930 | 2370 | 2640 |
| 5 - 8 (DN125 - DN200) | | Sch. 10 - Sch. 40 | 730 | 1040 | 1270 | 1420 |

NPS Brace Pipe Dimensions per ASTM A53 Sch. 40, ASTM A106 Sch. 40, or equivalent.
 NPS Service Pipe Dimensions per ASTM A53, ASTM A106 or equivalent.
 DN Service Pipe Dimensions per EN 10220, GB/T 8163, or equivalent listed with LW loads.
 DN Service Pipe Dimensions per GB/T 3091, GB/T 3092, EN10255M, EN10255H, KS D 3507/3537, or equivalent listed with Sch. 10 loads.
 DN Service Pipe Dimensions per JIS G3452, KS D 3562 Sch. 40 or equivalent listed with Sch. 40 Loads.
 DN Brace Pipe Dimensions per GB/T 3091, EN10255H, JIS G3454 Sch. 40, KS D 3562 Sch. 40, or equivalent.
 * Load Rating for LW above refers to FM Approved Lightwall pipe, commonly referred to as Sch. 7 and Flow Pipe. See FM Approval Guide for approved Lightwall pipe.
 ** Brace Pipe Angles are determined from vertical.
 *** The allowable FM approved capacity of brace subassemblies are listed in Allowable Stress Design (ASD). For Load Resistance Factor Design (LRF) capacities, the above values will need to be multiplied by 1.5.

Fig. AF075 (Formerly Afcon Fig. 075) Sway Brace Swivel Attachment

Size Range: Brace Pipe: 1" through 2" Sch. 40, DN25 through DN50
Anchor Size: 1/2"

Material: Ductile Iron Cast Hoop End with Carbon Steel Baseplate and Hardware

Finish: Plain or Electro-Galvanized per ASTM B633

Service: A seismic swivel attachment designed to connect brace pipe to the building structure or to a seismic structural attachment. The Sway Brace Swivel Attachment rigidly braces piping systems subjected to horizontal seismic loads.

Approvals: cULus Listed (UL 203a) and FM Approved (FM 1950-10 & FM 1950-13). Complies with the hanging and bracing requirements listed in NFPA 13.

Features:

- Large installation hole in the cast hoop end allows the brace pipe to pass through easily without interference.
- Field adjustable design requires no threading of the brace pipe
- The set screw design provides a visual indication that the desired torque value has been achieved

Installation Instructions:

- Insert anchor through the mounting hole and into the structure or seismic structural attachment.
- For connection to Fig. AF085, AF086, AF087, and AF779 seismic structural attachments, the bolt and nuts shall be installed wrench tight (typically finger tight plus 1/4 to 1/2 turns).
- For connection to concrete, wood, timber, steel, and other structures, install fasteners per the fastener manufacturer's installation instructions.
- Insert Sch. 40 brace pipe into the cast hoop end. The brace pipe should extend a minimum of 0.50" past the back of the cast hoop end.
- Torque set screw until the head bottoms out on the cast hoop end.
- Check the cross bolt and nut and ensure the nut is wrench tight.
- Fire Protection applications shall also be installed per the requirements of NFPA 13 and local codes.

Ordering: Specify brace pipe, figure number, finish and description.

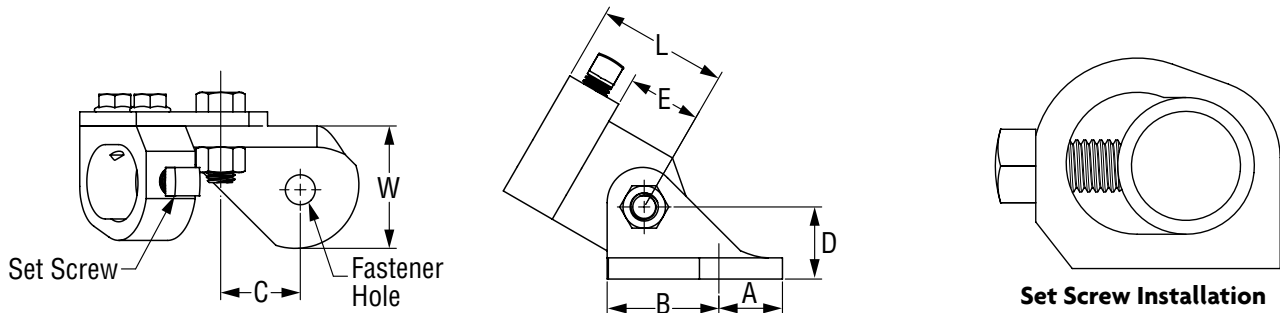


FIG. AF075: DIMENSIONS (IN) • WEIGHT (LBS)

| Brace Size | Fastener Size | A | B | C | D | E | L | W | Weight |
|--------------|---------------|------|------|------|------|--------|--------|-------|--------|
| 1 (DN25) | 1/2 | 1.00 | 1.83 | 1.25 | 1.38 | 1 5/16 | 2 5/16 | 2 1/8 | 1.70 |
| 1 1/4 (DN25) | | | | | | | | | 1.80 |
| 1 1/2 (DN40) | | | | | | | | | 1.90 |
| 2 (DN50) | | | | | | | | | 2.04 |

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Fig. AF075 (Formerly Afcon Fig. 075) Sway Brace Swivel Attachment (cont.)

| FIG. AF075 cULus MAX SEISMIC HORIZONTAL LOADS: DIMENSIONS (IN) • LOADS (LBS) | | | |
|---|---------------|------------------------|-----------------------|
| Brace Pipe Size | Fastener Size | Max Seismic Brace Load | Max Service Pipe Size |
| 1 - 2 (DN25 - DN50) | 1/2 | 2015 | 8 |

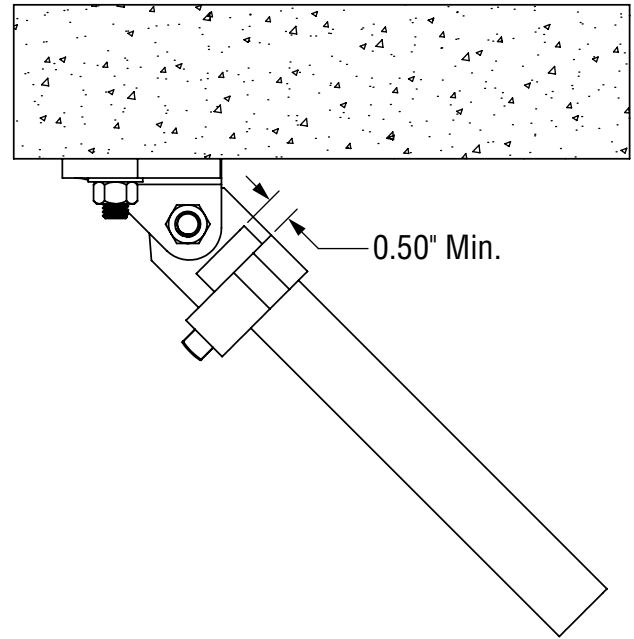
NPS Brace Pipe Dimensions per ASTM A53 Sch 40, ASTM A106 Sch. 40, or equivalent.
DN Brace Pipe Dimensions per KS D 3562 Sch. 40 or equivalent.

| FIG. AF075 FM MAX SEISMIC HORIZONTAL ASD LOADS**: DIMENSIONS (IN) • LOADS (LBS) | | | | | |
|--|---------------|---|-------|-------|-------|
| Brace Pipe Size | Fastener Size | Max Seismic Brace Load at Brace Pipe Angle* | | | |
| | | 30-44 | 45-59 | 60-74 | 75-90 |
| 1 - 2 (DN25 - DN50) | 1/2 | 1410 | 2000 | 2450 | 2740 |

NPS Brace Pipe Dimensions per ASTM A53 Sch 40, ASTM A106 Sch. 40, or equivalent.
DN Brace Pipe Dimensions per GB/T 3091, EN10255H, JIS G3454 Sch 40, KS D 3562 Sch. 40, or equivalent.

* Brace Pipe Angles are determined from vertical.

**The allowable FM approved capacity of brace subassemblies are listed in Allowable Stress Design (ASD). For Load Resistance Factor Design (LRFD) capacities, the above values will need to be multiplied by 1.5.



| FIG. AF075 HORIZONTAL PRYING FACTORS (Pr) PER NFPA: ANGLES (DEG) | | | | | | | | | | |
|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|
| Brace Orientation* | A | B | C | D | E | F | G | H | I | |
| Brace Angle** | 30-44 | 45-59 | 60-90 | 30-44 | 45-59 | 60-90 | 30-44 | 45-59 | 60-90 | |
| Prying Factor (Pr) | 3.724 | 2.150 | 1.375 | 2.150 | 2.150 | 2.250 | 2.750 | 1.945 | 1.588 | |

* Brace Orientation per NFPA 13-2016 Figure 9.3.5.12.1.

** Brace Pipe Angles are determined from vertical.

Fig. AF076 (Formerly Afcon Fig. 076) Sway Brace Swivel Attachment

Size Range: Brace Pipe: 1" through 2", DN25 through DN50
Anchor Size: 1/2"

Material: Ductile Iron Jaw with Carbon Steel Baseplate and Hardware

Finish: Plain or Electro-Galvanized per ASTM B633

Service: A seismic swivel attachment designed to connect brace pipe to the building structure or to a seismic structural attachment. The Sway Brace Swivel Attachment rigidly braces piping systems subjected to lateral seismic loads.

Approvals: cULus Listed (UL 203a) and FM Approved (FM 1950-10 & FM 1950-13). Complies with the hanging and bracing requirements listed in NFPA 13.

Features:

- One universal jaw allows for attachment to multiple brace pipe sizes.
- Field adjustable design requires no threading of the brace pipe.
- Shear off set screw provides a visual indication that the desired torque value has been achieved.

Installation Instructions:

- Insert anchor through the mounting hole and into the structure or seismic structural attachment.
- For connection to Fig. AF085, AF086, AF087, and AF779 seismic structural attachments, the bolt and nuts shall be installed wrench tight (typically finger tight plus 1/4 to 1/2 turns).
- For connection to concrete, wood, timber, steel, and other structures, install fasteners per the fastener manufacturer's installation instructions.
- Insert Sch. 40 brace pipe into the brace jaw until the brace pipe bottoms out.
- Torque shear off bolt until head shears off.
- Check the cross bolt and nut and ensure the nut is wrench tight.
- Fire Protection applications shall also be installed per the requirements of NFPA 13 and local codes.

Ordering: Specify figure number, finish and description.

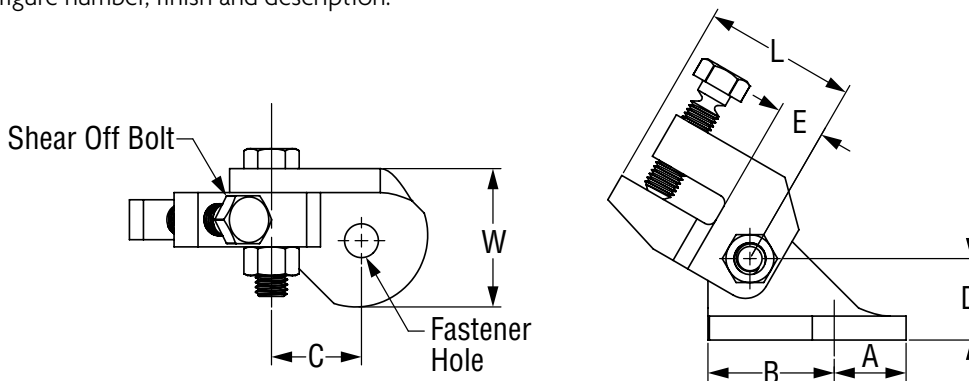
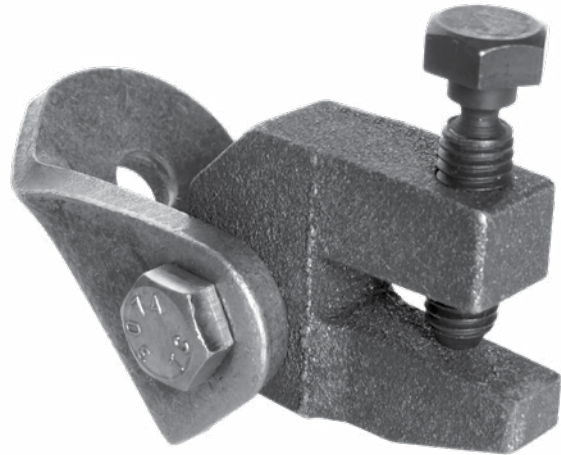


FIG. AF076: DIMENSIONS (IN) • WEIGHT (LBS)

| Fastener Size | A | B | C | D | E | L | W | Weight |
|---------------|------|------|------|------|-----|-------|-------|--------|
| 1/2 | 1.00 | 1.83 | 1.25 | 1.38 | 3/4 | 2 5/8 | 2 1/8 | 1.68 |

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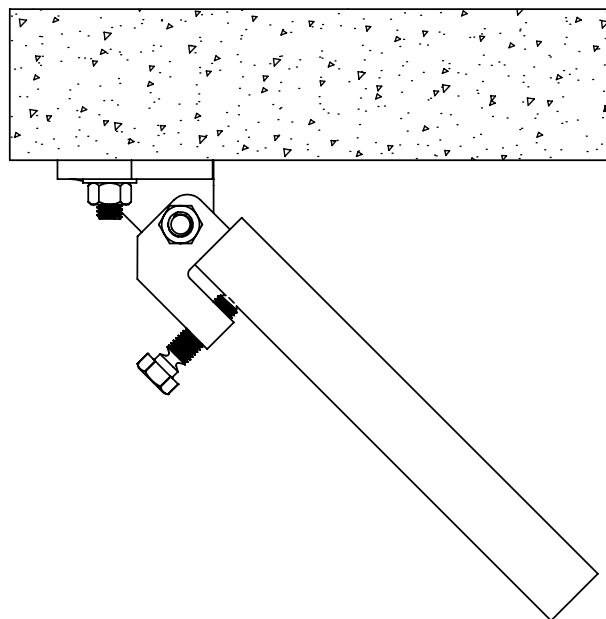
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Fig. AF076 (Formerly Afcon Fig. 076) Sway Brace Swivel Attachment (cont.)

| FIG. AF076 cULus MAX SEISMIC HORIZONTAL LOADS: DIMENSIONS (IN) • LOADS (LBS) | | | |
|---|---------------|------------------------|-----------------------|
| Brace Pipe Size | Fastener Size | Max Seismic Brace Load | Max Service Pipe Size |
| 1 - 2 (DN25 - DN50) | 1/2 | 2765 | 10 |

NPS Brace Pipe Dimensions per ASTM A53 Sch. 40, ASTM A106 Sch. 40, or equivalent.
DN Brace Pipe Dimensions per KS D 3562 Sch. 40 or equivalent.



| FIG. AF076 FM MAX SEISMIC HORIZONTAL ASD LOADS**: DIMENSIONS (IN) • LOADS (LBS) | | | | | |
|--|---------------|---|-------|-------|-------|
| Brace Pipe Size | Fastener Size | Max Seismic Brace Load at Brace Pipe Angle* | | | |
| | | 30-44 | 45-59 | 60-74 | 75-90 |
| 1 - 2 (DN25 - DN50) | 1/2 | 1310 | 1810 | 2630 | 2930 |

NPS Brace Pipe Dimensions per ASTM A53 Sch. 40, ASTM A106 Sch. 40, or equivalent.
DN Brace Pipe Dimensions per GB/T 3091, EN10255H, JIS G3454 Sch. 40, KS D 3562 Sch. 40, or equivalent.

* Brace Pipe Angles are determined from vertical.

**The allowable FM approved capacity of brace subassemblies are listed in Allowable Stress Design (ASD). For Load Resistance Factor Design (LRFD) capacities, the above values will need to be multiplied by 1.5.

| FIG. AF076 HORIZONTAL PRYING FACTORS (Pr) PER NFPA: ANGLES (DEG) | | | | | | | | | |
|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Brace Orientation* | A | B | C | D | E | F | G | H | I |
| Brace Angle** | 30-44 | 45-59 | 60-90 | 30-44 | 45-59 | 60-90 | 30-44 | 45-59 | 60-90 |
| Prying Factor (Pr) | 3.724 | 2.150 | 1.375 | 2.150 | 2.150 | 2.250 | 2.750 | 1.945 | 1.588 |

* Brace Orientation per NFPA 13-2016 Figure 9.3.5.12.1.

** Brace Pipe Angles are determined from vertical.

Fig. AF077 (Formerly Afcon Fig. 077) Sway Brace Swivel Attachment

Size Range: Brace Pipe: 1" through 1½" Sch. 40; Anchor Size: ½"

Material: Carbon Steel

Finish: Plain or Electro-Galvanized per ASTM B633

Service: A seismic swivel attachment designed to connect brace pipe to the building structure or to a seismic structural attachment. The Sway Brace Swivel Attachment rigidly braces piping systems subjected to horizontal seismic loads.

Approvals: cULus Listed (UL 203a) and FM Approved (FM 1950-10 & FM 1950-13). Complies with the hanging and bracing requirements listed in NFPA 13.

Features:

- Field adjustable design requires no threading of the brace pipe
- The set screw design provides a visual indication that the desired torque value has been achieved.

Installation Instructions:

- Insert anchor through the mounting hole and into the structure or seismic structural attachment.
- For connection to Fig. AF085, AF086, AF087, and AF779 seismic structural attachments, the bolt and nuts shall be installed wrench tight (typically finger tight plus ¼ to ½ turns).
- For connection to concrete, wood, timber, steel, and other structures, install fasteners per the fastener manufacturer's installation instructions.
- Insert Sch. 40 brace pipe into the bracket end. The brace pipe should extend a minimum of 0.50" past the back of the bracket.
- Torque set screw until the head bottoms out on the bracket.
- Check the cross bolt and nut and ensure the nut is wrench tight.
- Fire Protection applications shall also be installed per the requirements of NFPA 13 and local codes.

Ordering: Specify brace pipe size, figure number, finish, and description.

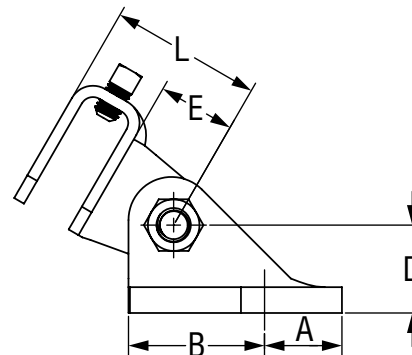
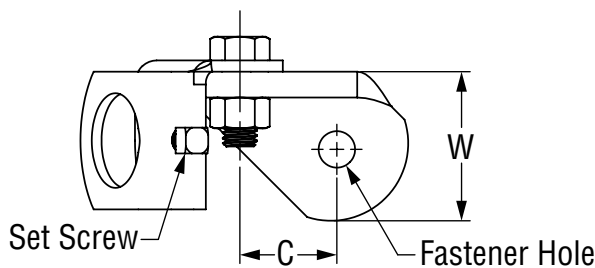
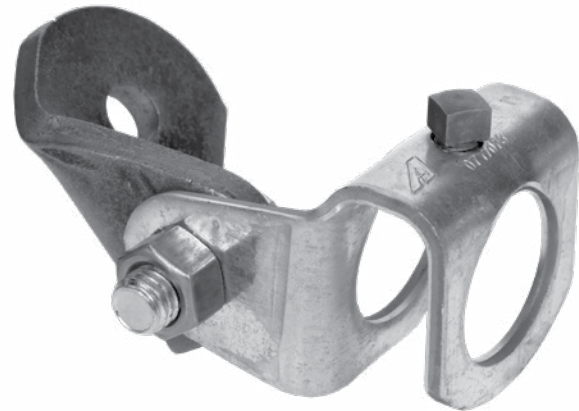


FIG. AF077: DIMENSIONS (IN) • WEIGHT (LBS)

| Fastener Size | Brace Size | A | B | C | D | E | L | W | Weight |
|---------------|------------|------|------|------|------|----|----|----|--------|
| ½ | 1 | 1.00 | 1.83 | 1.25 | 1.38 | 1⅛ | 2⅜ | 2⅝ | 1.12 |
| | 1¼ | | | | | | 2⅞ | | 1.28 |

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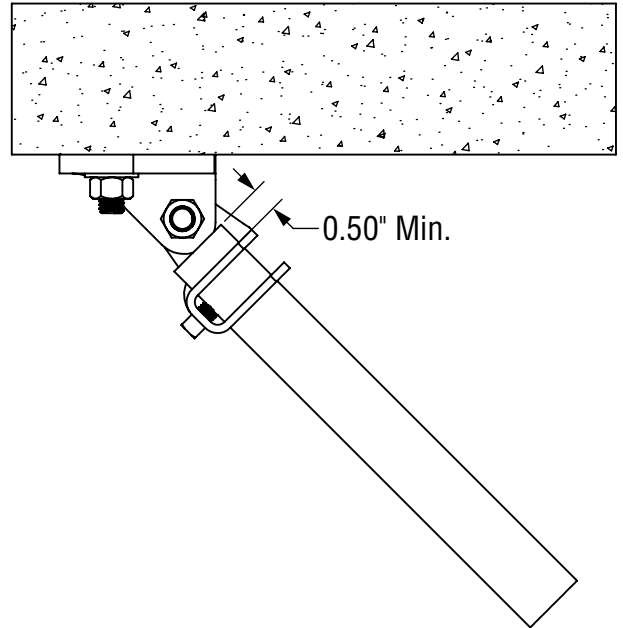
Fig. AF077 (Formerly Afcon Fig. 077) Sway Brace Swivel Attachment (cont.)

| FIG. AF077 cULus MAX SEISMIC HORIZONTAL LOADS: DIMENSIONS (IN) • LOADS (LBS) | | | |
|---|---------------|------------------------|-----------------------|
| Brace Pipe Size | Fastener Size | Max Seismic Brace Load | Max Service Pipe Size |
| 1 - 1 ¹ / ₄ | 1/2 | 1000 | 4 |

| FIG. AF077 FM MAX SEISMIC HORIZONTAL ASD LOADS**: DIMENSIONS (IN) • LOADS (LBS) | | | | | |
|--|---------------|---|-------|-------|-------|
| Brace Pipe Size | Fastener Size | Max Seismic Brace Load at Brace Pipe Angle* | | | |
| | | 30-44 | 45-59 | 60-74 | 75-90 |
| 1 - 1 ¹ / ₄ | 1/2 | 430 | 620 | 760 | 840 |

* Brace Pipe Angles are determined from vertical.

**The allowable FM approved capacity of brace subassemblies are listed in Allowable Stress Design (ASD). For Load Resistance Factor Design (LRFD) capacities, the above values will need to be multiplied by 1.5.



| FIG. AF077 HORIZONTAL PRYING FACTORS (Pr) PER NFPA: ANGLES (DEG) | | | | | | | | | |
|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Brace Orientation* | A | B | C | D | E | F | G | H | I |
| Brace Angle** | 30-44 | 45-59 | 60-90 | 30-44 | 45-59 | 60-90 | 30-44 | 45-59 | 60-90 |
| Prying Factor (Pr) | 3.724 | 2.150 | 1.375 | 2.150 | 2.150 | 2.250 | 2.750 | 1.945 | 1.588 |

* Brace Orientation per NFPA 13-2016 Figure 9.3.5.12.1.

** Brace Pipe Angles are determined from vertical.

Fig. AF085 (Formerly Afcon Fig. 085)

Joist Adapter

Size Range: Joist Gap: 1/2" through 1 1/4"

Material: Carbon Steel

Finish: Plain or Electro-Galvanized per ASTM B633

Service: A seismic structural attachment designed to attach to steel joists. The joist adapter rigidly braces piping systems subjected to horizontal seismic loads.

Approvals: cULus Listed (UL 203a). Complies with the hanging and bracing requirements listed in NFPA 13. Additionally, cULus Listed (UL 203) as a hanger for up to 8" pipe.

Features: Center loads the steel joist.

Installation Instructions:

- Thread 1/2"-13 Rod through the tapped hole in the top plate of the joist adapter.
- Center the top plate and rod over the gap of the steel joist
- Center the bottom bracket between the vertical flanges and allow the rod to pass through the 1/2" thru hole.
- Mount the Fig. AF075, AF076, or AF077 on the underside of the bottom bracket.
- Install the 1/2"-13 standard hex nut on the exposed rod. The hex nut shall be torqued to 40ft*lbs.
- Installation angle determined by the brace angle of the brace pipe and the AF075, AF076, or AF077.
- Fire Protection applications shall also be installed per the requirements of NFPA 13 and local codes.

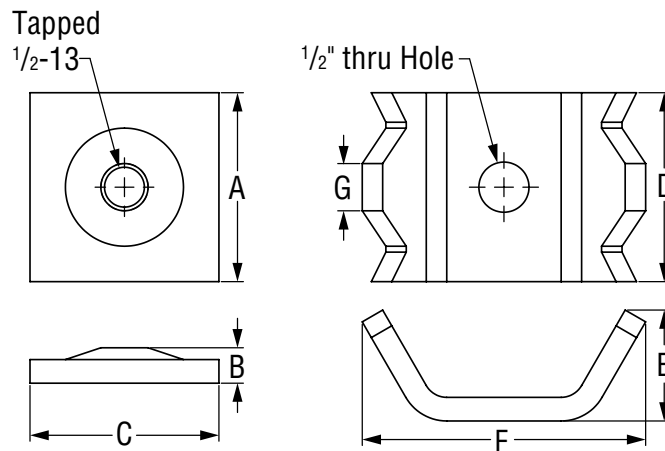
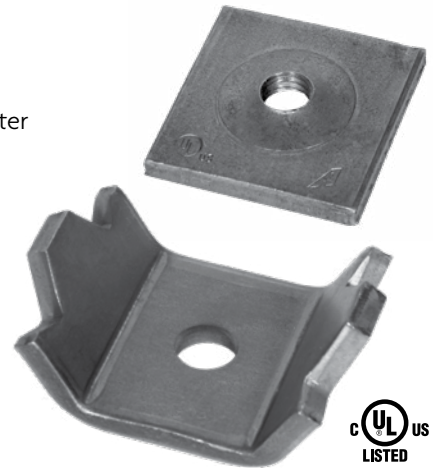


FIG. AF085: DIMENSIONS (IN) • WEIGHT (LBS)

| A | B | C | D | E | F | G | Weight |
|---|-----|---|---|--------|---|-----|--------|
| 2 | 3/8 | 2 | 2 | 1 3/16 | 3 | 1/2 | 0.72 |

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Fig. AF085 (Formerly Afcon Fig. 085)

Joist Adapter (cont.)

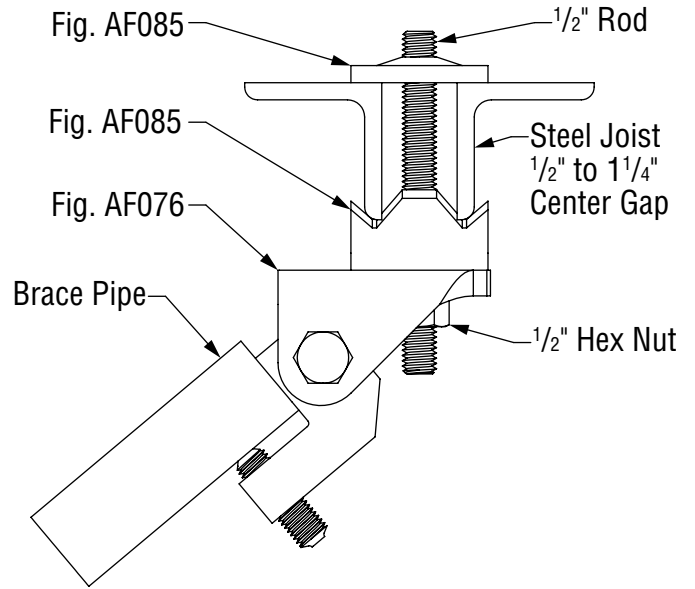
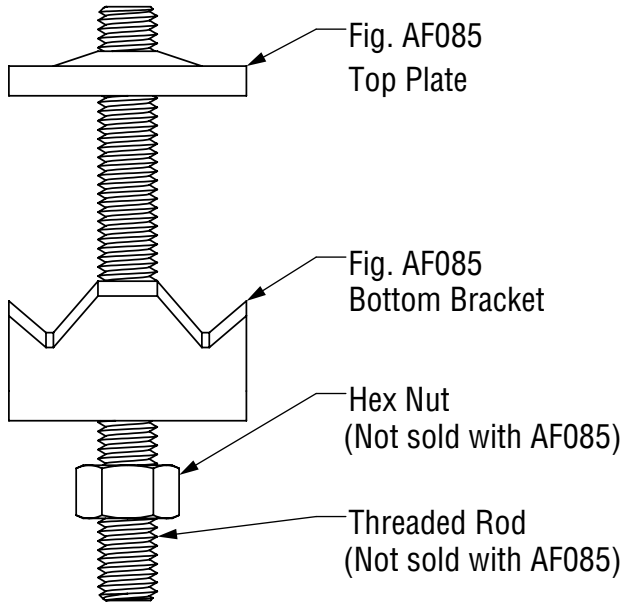


FIG. AF085 cULus MAX SEISMIC HORIZONTAL LOADS: DIMENSIONS (IN) • LOADS (LBS)

| Structure | Seismic Load Orientation | Max Seismic Brace Load | Max Service Pipe Size |
|-------------|--------------------------|------------------------|-----------------------|
| Steel Joist | Parallel to Joist | 2015 | 8 |
| | Perpendicular to Joist | | |

Fig. AF086 (Formerly Afcon Fig. 086) Adjustable Structural Brace Attachment

Size Range: Fits flange thickness from 1/4" to 1 1/4" (UL and FM)

Material: Carbon Steel

Finish: Plain or Electro-Galvanized per ASTM B633

Service: A seismic structural attachment designed to attach to steel I-beams. The structural brace attachment rigidly braces piping systems subjected to horizontal seismic loads.

Approvals: cULus Listed (UL 203a) and FM Approved (FM 1950-10 & FM 1950-13). Complies with the hanging and bracing requirements listed in NFPA 13. Additionally, cULus Listed (UL 203) as a hanger for up to 8" pipe.

Features: Shear off nuts provide a visual indication that the desired torque value has been achieved.

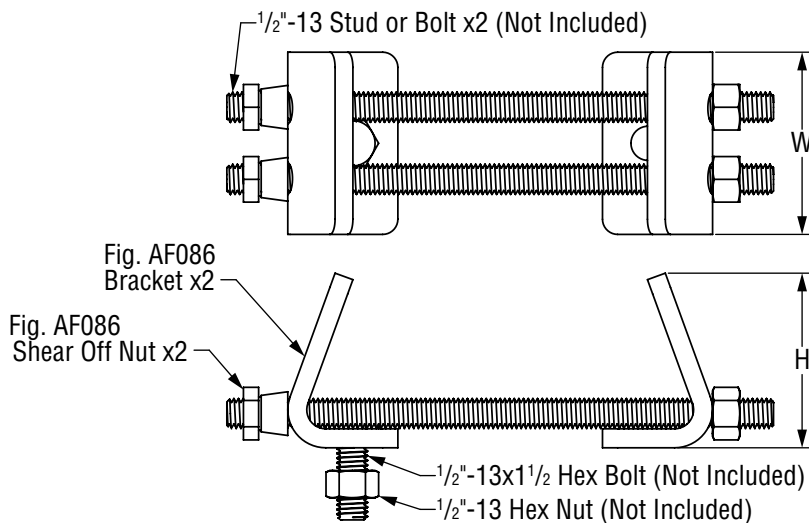
Installation Instructions:

- Insert one 1/2" x 1 1/2" hex bolt through the mounting hole of one bracket.
- Place both brackets on a horizontal steel flange.
- Install two 1/2"-13 studs or bolts with the shear off nuts through the mounting slots on both brackets. Studs or bolts manufactured per ASTM A307 or equivalent.
- Torque shear off nuts evenly and equally until the heads shear off.
- Install the 1/2" x 1 1/2" mounting bolt through the 1/2" AF075, AF076, or AF077 mounting hole. The mounting bolt shall be installed wrench tight (typically finger tight plus 1/4 to 1/2 turns).
- Installation angle determined by the brace angle of the brace pipe and the AF075, AF076, or AF077.
- Fire Protection applications shall also be installed per the requirements of NFPA 13 and local codes.

Patent: No. 6,334,285

Ordering: Specify figure number, finish and description.

Note: Only sold with brackets and shear off nuts. 1/2" x 1 1/2" hex bolt and 1/2"-13 studs or bolts not included.



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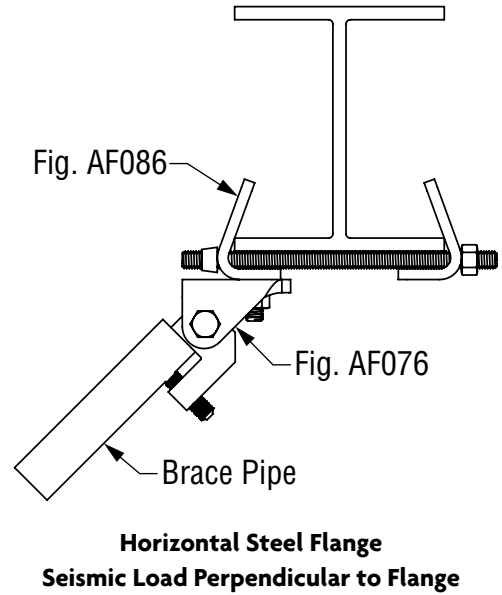
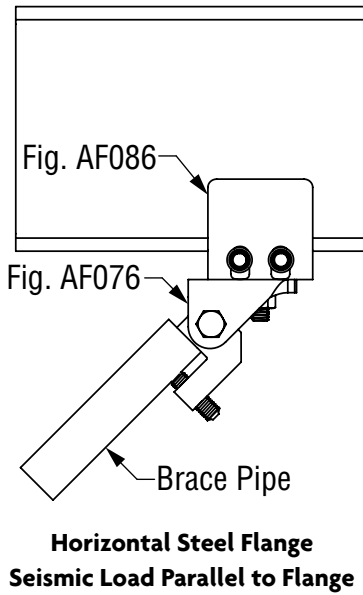
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FIG. AF086: DIMENSIONS (IN) • WEIGHT (LBS)

| Mounting Bolt | Mounting Slots | H | W | Weight |
|---------------|----------------|-------|---|--------|
| 1/2 | 1/2 | 2 3/4 | 3 | 2.25 |

Fig. AF086 (Formerly Afcon Fig. 086)

Adjustable Structural Brace Attachment (cont.)



| FIG. AF086 cULus MAX SEISMIC HORIZONTAL LOADS: DIMENSIONS (IN) • LOADS (LBS) | | | | |
|---|--------------------------|----------------------|------------------------|-----------------------|
| Structure | Seismic Load Orientation | Max Flange Thickness | Max Seismic Brace Load | Max Service Pipe Size |
| Horizontal Steel Flange | Parallel to Flange | 1 1/4 | 1265 | 4 |
| | Perpendicular to Flange | | 2015 | 8 |

| FIG. AF086 FM MAX SEISMIC HORIZONTAL ASD LOADS**: DIMENSIONS (IN) • LOADS (LBS) • ANGLES (DEG) | | | | | | |
|---|--------------------------|------------------|---|-------|-------|-------|
| Structure | Seismic Load Orientation | Flange Thickness | Max Seismic Brace Load at Brace Pipe Angle* | | | |
| | | | 30-44 | 45-59 | 60-74 | 75-90 |
| Horizontal Steel Flange | Parallel to Flange | 1/4 - 1 1/4 | 1270 | 890 | 1070 | 1190 |
| | Perpendicular to Flange | | 1180 | 1630 | 1990 | 2220 |

* Brace Pipe Angles are determined from vertical.

**The allowable FM approved capacity of brace subassemblies are listed in Allowable Stress Design (ASD). For Load Resistance Factor Design (LRFD) capacities, the above values will need to be multiplied by 1.5.

Fig. AF087 (Formerly Afcon Fig. 087)

Structural Brace Attachment

Size Range: Flange Thickness: Up to 1/2" thick (UL), Up to 3/8" thick (FM)

Material: Ductile Iron with Carbon Steel Hardware

Finish: Plain or Electro-Galvanized per ASTM B633

Service: A seismic structural attachment designed to attach to steel I-beams, flanges, and joists. The Structural Brace Attachment rigidly braces piping systems subjected to horizontal seismic loads.

Approvals: cULus Listed (UL 203a) and FM Approved (FM 1950-10 & FM 1950-13).

Complies with the hanging and bracing requirements listed in NFPA 13.

Features: Shear off bolt provides a visual indication that the desired torque value has been achieved.

Installation Instructions:

- Place structural brace attachment on a horizontal or vertical steel flange.
- Torque shear off bolts evenly and equally until the head shears off.
- Install the 1/2" mounting bolt through the 1/2" AF075, AF076, or AF077 mounting hole. The mounting bolt shall be installed wrench tight (typically finger tight plus 1/4 to 1/2 turns).
- Installation angle determined by the brace angle of the brace pipe and the AF075, AF076, or AF077.
- Fire Protection applications shall also be installed per the requirements of NFPA 13 and local codes.

Patent: No. 6,629,678

Ordering: Specify figure number, finish and description.

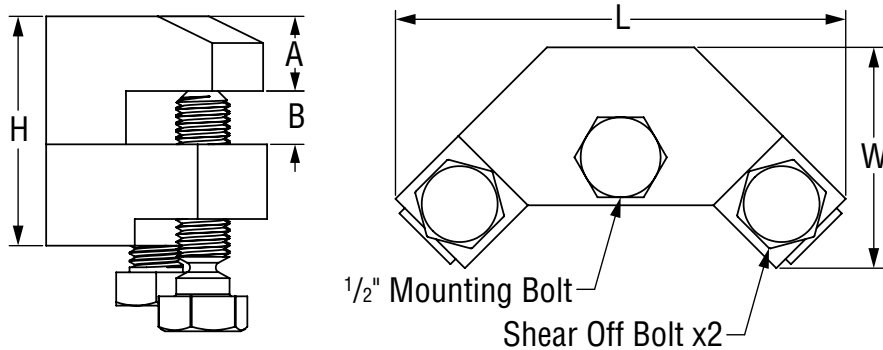
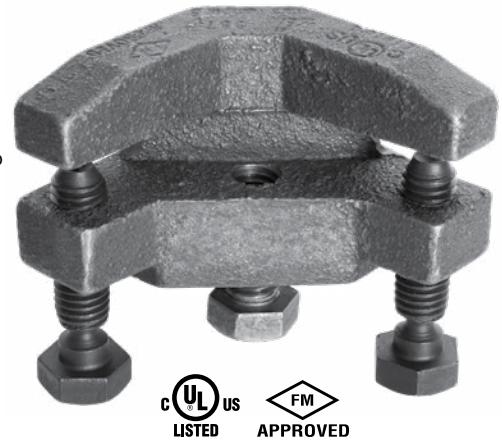


FIG. AF087: DIMENSIONS (IN) • WEIGHT (LBS)

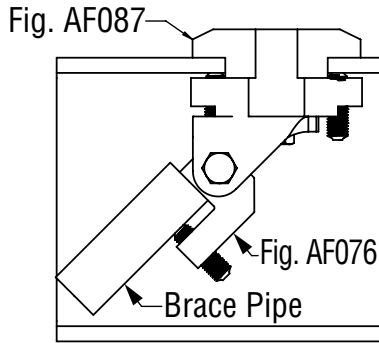
| Mounting Bolt | L | W | H | A | B | Weight |
|---------------|-------|---|-------|-----|-----|--------|
| 1/2 | 4 1/4 | 2 | 2 1/8 | 3/4 | 1/2 | 2.00 |

Notes: Anvil International® brand bracing components are designed to be compatible ONLY with other Anvil International® brand bracing components, resulting in a Listed seismic bracing assembly. Updated UL listing information may be viewed at www.ul.com and updated FM approval information may be viewed at www.approvalguide.com.

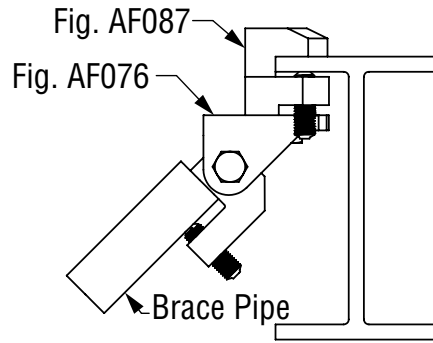
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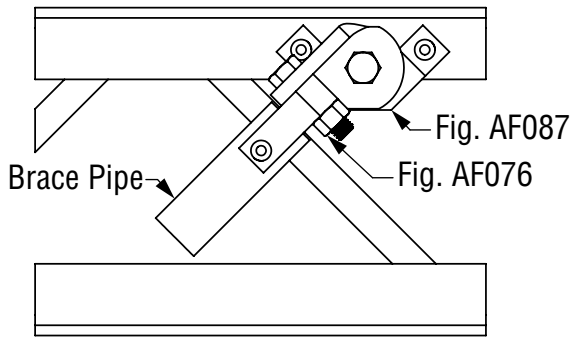
Fig. AF087 (Formerly Afcon Fig. 087) Structural Brace Attachment (cont.)



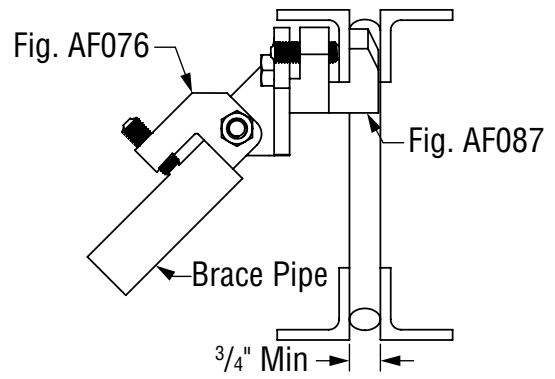
**Horizontal Steel Flange
Seismic Load Parallel to Flange**



**Horizontal Steel Flange
Seismic Load Perpendicular to Flange**



**Vertical Steel Flange
Seismic Load Parallel to Flange**



**Vertical Steel Flange
Seismic Load Perpendicular to Flange**

FIG. AF087 cULus MAX SEISMIC HORIZONTAL LOADS: DIMENSIONS (IN) • LOADS (LBS)

| Structure | Seismic Load Orientation | Max Flange Thickness | Max Seismic Brace Load | Max Service Pipe Size |
|---|--------------------------|----------------------|------------------------|-----------------------|
| Horizontal Steel Flange and Vertical Steel Flange | Parallel to Flange | 1/2 | 1400 | 4 |
| | Perpendicular to Flange | | | |

FIG. AF087 FM MAX SEISMIC HORIZONTAL ASD LOADS**: DIMENSIONS (IN) • LOADS (LBS) • ANGLES (DEG)

| Structure | Seismic Load Orientation | Min Flange Thickness | Max Seismic Brace Load at Brace Pipe Angle* | | | |
|-----------------------|--------------------------|----------------------|---|-------|-------|-------|
| | | | 30-44 | 45-59 | 60-74 | 75-90 |
| Vertical Steel Flange | Parallel to Flange | 3/8 | 1270 | 1740 | 2140 | 2380 |
| | Perpendicular to Flange | | 1150 | 1630 | 3230 | 3610 |

* Brace Pipe Angles are determined from vertical.

**The allowable FM approved capacity of brace subassemblies are listed in Allowable Stress Design (ASD). For Load Resistance Factor Design (LRFD) capacities, the above values will need to be multiplied by 1.5.

Fig. AF411 (Formerly Afcon Fig. 411) Fig. AF074 (Formerly Afcon Fig. 074) Fig. AF078 (Formerly Afcon Fig. 078)

Longitudinal Seismic Clamp Brace Attachment Fitting Brace Attachment Fitting

Size Range: Service Pipe: 1" through 8" Carbon Steel
Brace Pipe: 1" through 2" Sch. 40

Material: Carbon Steel (AF074 Only: Ductile Iron Brace Socket)

Finish: Plain or Electro-Galvanized per ASTM B633

Service: Designed to rigidly brace piping systems subjected to longitudinal seismic loads. The Fig. AF411 may be installed with Fig. AF074 or AF078 Brace Attachment Fittings.

Approvals: cULus Listed (UL 203a) and FM Approved (FM 1950-10 & FM 1950-13). Complies with the hanging and bracing requirements listed in NFPA 13.

Features: Visual indication of assembly when the clamp ears make metal-to-metal contact.

Installation Instructions:

- Mount the Fig. AF074 or AF078 on the outside of the outside of the Fig. AF411 clamps ears.
- Position the clamp at the desired location on the service pipe and hand tighten the hex bolts.
- Insert brace pipe into the AF074 or AF078 socket and torque the set screw until the head bottoms out on the AF074 or AF078. Brace pipe must extend 1/2" past the end of the brace socket.
- Ensure the brace pipe is set to the desired installation brace angle.
- Tighten the clamp bolts and nuts equally and alternately until metal-to-metal contact is achieved and the nuts are wrench tight.
- Fire Protection applications shall also be installed per the requirements of NFPA 13 and local codes.

Ordering: AF411: Specify service pipe size, figure number, finish, and description.

AF074 & AF078: Specify brace pipe size, figure number, finish, and description.

AF411, AF074, & AF078 all sold separately.



Fig. AF411

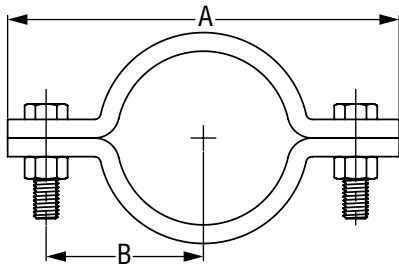
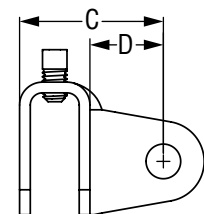
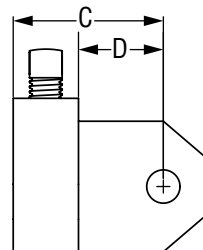


Fig. AF074



Fig. AF078



| FIG. AF411: DIMENSIONS (IN) • WEIGHT (LBS) | | | |
|--|--------------------------------|-------------------------------|--------|
| Service Pipe Size | A | B | Weight |
| 1 | 5 ⁵ / ₈ | 2 ¹ / ₈ | 1.75 |
| 1 ¹ / ₄ | 6 | 2 ¹ / ₄ | 1.90 |
| 1 ¹ / ₂ | 6 ¹ / ₈ | 2 ¹ / ₄ | 2.00 |
| 2 | 6 ³ / ₄ | 2 ¹ / ₂ | 2.15 |
| 2 ¹ / ₂ | 7 ⁵ / ₈ | 2 ³ / ₈ | 2.40 |
| 3 | 7 ⁷ / ₈ | 3 ¹ / ₈ | 2.60 |
| 4 | 9 | 3 ³ / ₈ | 3.10 |
| 6 | 11 ¹ / ₂ | 4 ⁷ / ₈ | 4.50 |
| 8 | 13 ¹ / ₂ | 5 ⁵ / ₈ | 5.50 |

| FIG. AF074 & AF078: DIMENSIONS (IN) • WEIGHT (LBS) | | | | | | |
|--|--------------------------------|--------------------------------|--------|--------------------------------|-------------------------------|--------|
| Brace Pipe | AF074 | | | AF078 | | |
| | C | D | Weight | C | D | Weight |
| 1 | 2 ³ / ₁₆ | 1 ¹ / ₁₆ | 0.97 | 2 ⁵ / ₁₆ | 1 ¹ / ₈ | 0.38 |
| 1 ¹ / ₄ | | | 1.07 | | | 0.54 |
| 1 ¹ / ₂ | | | 1.17 | | | |
| 2 | | | 1.31 | | | |

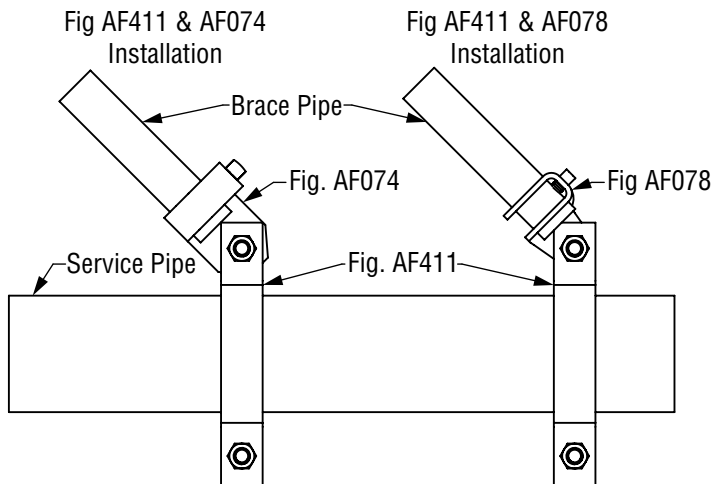
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Fig. AF411 (Formerly Afcon Fig. 411)
Fig. AF074 (Formerly Afcon Fig. 074)
Fig. AF078 (Formerly Afcon Fig. 078)

Longitudinal Seismic Clamp
Brace Attachment Fitting
Brace Attachment Fitting



| FIG. AF411 cULus MAX SEISMIC LONGITUDINAL LOADS: DIMENSIONS (IN) • LOADS (LBS) | | | | |
|---|--------------------------|-----------------|------------------------|---------|
| Service Pipe size | Brace Attachment Fitting | Brace Pipe Size | Max Seismic Brace Load | |
| | | | Sch. 10 | Sch. 40 |
| 1 | AF074 | 1 – 2 | — | 2015 |
| | AF078 | 1 – 1¼ | — | 1000 |
| 1¼ – 4 | AF074 | 1 – 2 | 2015 | 2015 |
| | AF078 | 1 – 1¼ | 1000 | 1000 |
| 6 – 8 | AF074 | 1 – 2 | 2015 | 2015 |

FIG. AF411 FM MAX SEISMIC LONGITUDINAL ASD LOADS*: DIMENSIONS (IN) • LOADS (LBS) • ANGLES (DEG)**

| Service Pipe Size | Pipe Schedules | Brace Attachment Fitting | Brace Pipe Size | Max Seismic Brace Load at Brace Pipe Angle** | | | |
|-------------------|-------------------|--------------------------|-----------------|--|-------|-------|-------|
| | | | | 30-44 | 45-59 | 60-74 | 75-90 |
| 1 – 1½ | Sch. 10 – Sch. 40 | AF074 | 1 – 2 | 1070 | 420 | 510 | 570 |
| | | AF078 | 1 – 1¼ | 430 | 420 | 510 | 570 |
| 2 | LW – Sch. 40 | AF074 | 1 – 2 | 1410 | 1900 | 1730 | 1930 |
| | | AF078 | 1 – 1¼ | 430 | 620 | 760 | 840 |
| 2½ – 3 | LW – Sch. 40 | AF074 | 1 – 2 | 1000 | 860 | 1030 | 1150 |
| | | AF078 | 1 – 1¼ | 430 | 620 | 760 | 840 |
| 4 | LW | AF074 | 1 – 2 | 1000 | 860 | 1030 | 1150 |
| | | AF078 | 1 – 1¼ | 430 | 620 | 760 | 840 |
| | Sch. 10 – Sch. 40 | AF074 | 1 – 2 | 1000 | 950 | 1150 | 1280 |
| | | AF078 | 1 – 1¼ | 430 | 620 | 760 | 840 |
| 6 | LW – Sch. 40 | AF074 | 1 – 2 | 1410 | 2000 | 2450 | 2740 |
| | | AF078 | 1 – 1¼ | 430 | 620 | 760 | 840 |
| 8 | Sch. 10 – Sch. 40 | AF074 | 1 – 2 | 1410 | 1250 | 1510 | 1690 |
| | | AF078 | 1 – 1¼ | 430 | 620 | 760 | 840 |

* Load rating for LW above refers to FM Approved Lightwall pipe, commonly referred to as Sch.7 and Flow Pipe. See FM Approval Guide for approved Lightwall pipe.

** Brace Pipe Angles are determined from vertical.

*** The allowable FM approved capacity of brace subassemblies are listed in Allowable Stress Design (ASD). For Load Resistance Factor Design (LRFD) capacities, the above values will need to be multiplied by 1.5.

Fig. AF771 (Formerly Anvil Fig. 771) Sway Brace Swivel Attachment

Size Range: Brace Pipe: 1", 1 1/4", DN25 and DN32

Anchor Size: 1/2" through 3/4"

Material: Ductile Iron with Carbon Steel Hardware

Finish: Plain or Electro-Galvanized per ASTM B633

Service: A seismic swivel attachment designed to connect brace pipe to the building structure or to a seismic structural attachment. The Sway Brace Swivel Attachment rigidly braces piping systems subjected to horizontal seismic loads. The Sway Brace Swivel Attachment may also be installed to rigidly brace piping systems subjected to vertical seismic loads. For vertical load capacities, reference OSHPD OPM-0351-13.

Approvals: cULus Listed (UL 203a) and FM Approved (FM 1950-10 & FM 1950-13). OSHPD Pre-Approved (OPM-0351-13 and OPA-2804-10). Complies with the hanging and bracing requirements listed in NFPA 13.



os hpd
OPM-0351-13



Features:

- Field adjustable design requires no threading of the brace pipe
- Shear off bolt provides a visual indication that the desired torque value has been achieved
- True concentric loading of the brace pipe

Installation Instructions:

- Insert anchor through the mounting hole and into the structure or seismic structural attachment.
- For connection to Fig. AF772, AF778, and AF779 seismic structural attachments, the bolt and nuts shall be installed wrench tight (typically finger tight plus 1/4 to 1/2 turns).
- For connection to concrete, wood, timber, steel, and other structures, install fasteners per the fastener manufacturer's installation instructions.
- Insert Sch. 40 brace pipe into the brace socket until the brace pipe bottoms out.
- Torque shear off bolt until head shears off.
- Check the cross bolt and nut and ensure the nut is wrench tight.
- Fire Protection applications shall also be installed per the requirements of NFPA 13 and local codes.

Ordering: Specify brace pipe size, fastener size, figure number, finish and description.

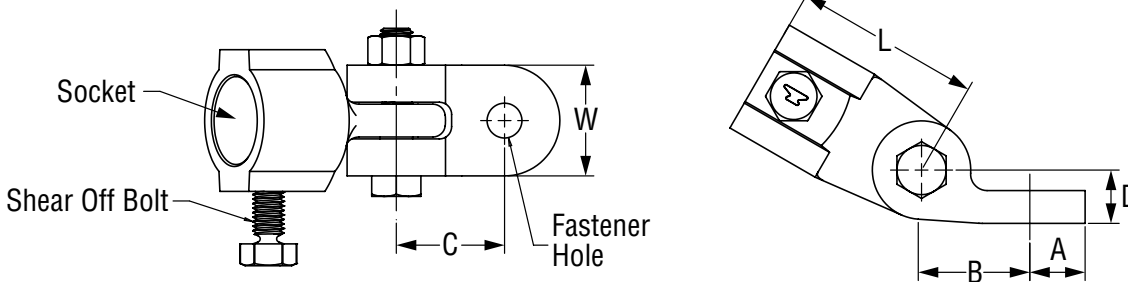


FIG. AF771: DIMENSIONS (IN) • WEIGHT (LBS)

| Brace Pipe Size | Fastener Size | A | B | C | D | W | L | Socket Depth | Weight |
|-----------------|---------------|------|------|------|------|---------|-------|--------------|--------|
| 1 (DN25) | 1/2 - 3/4 | 0.84 | 1.65 | 1.65 | 0.81 | 1 11/16 | 2 7/8 | 1 3/8 | 1.95 |
| 1 1/4 (DN32) | | | | | | | 3 | | 2.28 |

Notes: Anvil International® brand bracing components are designed to be compatible ONLY with other Anvil International® brand bracing components, resulting in a Listed seismic bracing assembly. Updated UL listing information may be viewed at www.ul.com and updated FM approval information may be viewed at www.approvalguide.com.

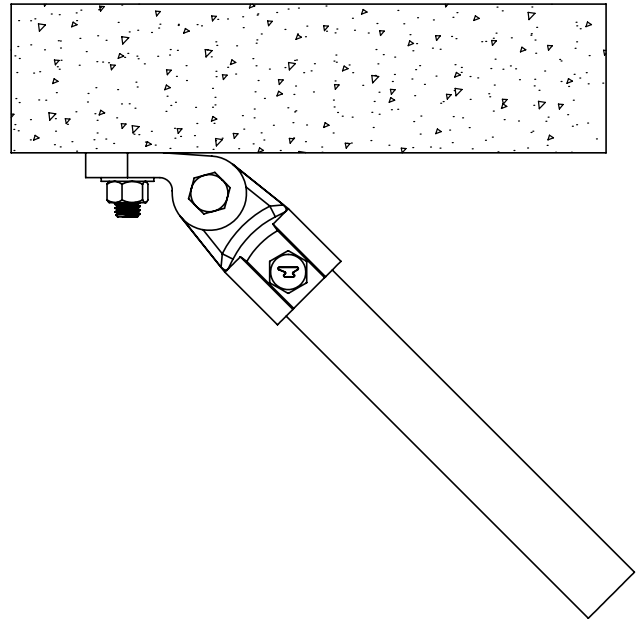
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Fig. AF771 (Formerly Anvil Fig. 771) Sway Brace Swivel Attachment (cont.)

| FIG. AF771 cULus MAX SEISMIC HORIZONTAL LOADS: DIMENSIONS (IN) • LOADS (LBS) | | | |
|---|---------------|------------------------|-----------------------|
| Brace Pipe Size | Fastener Size | Max Seismic Brace Load | Max Service Pipe Size |
| 1 - 1 ¹ / ₄ (DN25 - DN32) | 1/2 | 3740 | 12 |
| | 5/8 | | |
| | 3/4 | | |

NPS Brace Pipe Dimensions per ASTM A53 Sch. 40, ASTM A106 Sch. 40, or equivalent.
DN Brace Pipe Dimensions per KS D 3562 Sch. 40 or equivalent.



| FIG. AF771 FM MAX SEISMIC HORIZONTAL ASD LOADS**: DIMENSIONS (IN) • LOADS (LBS) | | | | | |
|--|---------------|---|-------|-------|-------|
| Brace Pipe Size | Fastener Size | Max Seismic Brace Load at Brace Pipe Angle* | | | |
| | | 30-44 | 45-59 | 60-74 | 75-90 |
| 1 - 1 ¹ / ₄ (DN-25 - DN32) | 1/2 | 1820 | 2540 | 3110 | 3470 |
| | 5/8 | 1520 | 2150 | 2630 | 2930 |
| | 3/4 | | | | |

NPS Brace Pipe Dimensions per ASTM A53 Sch. 40, ASTM A106 Sch. 40, or equivalent.
DN Brace Pipe Dimensions per GB/T 3091, EN10255H, JIS G3454 Sch. 40, KS D 3562 Sch. 40, or equivalent.

* Brace Pipe Angles are determined from vertical.

**The allowable FM approved capacity of brace subassemblies are listed in Allowable Stress Design (ASD). For Load Resistance Factor Design (LRFD) capacities, the above values will need to be multiplied by 1.5.

| FIG. AF771 HORIZONTAL PRYING FACTORS (Pr) PER NFPA: ANGLES (DEG) | | | | | | | | | |
|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Brace Orientation* | A | B | C | D | E | F | G | H | I |
| Brace Angle** | 30-44 | 45-59 | 60-90 | 30-44 | 45-59 | 60-90 | 30-44 | 45-59 | 60-90 |
| Prying Factor (Pr) | 4.171 | 2.000 | 0.965 | 1.966 | 2.385 | 2.965 | 1.929 | 1.364 | 1.114 |

* Brace Orientation per NFPA 13-2016 Figure 9.3.5.12.1.

** Brace Pipe Angles are determined from vertical.

Fig. AF772 (Formerly Anvil Fig. 772) Adjustable Steel Beam Attachment

Size Range: Beam Widths: 4" through 15"
Flange Thickness: $\frac{3}{8}$ " through $1\frac{1}{4}$ "

Material: Carbon steel

Finish: Plain or Electro-Galvanized per ASTM B633

Service: Designed to rigidly brace piping systems subjected to horizontal seismic loads. May also be installed to brace piping systems subjected to vertical seismic loads. For vertical load capacities, reference OSHPD OPM-0351-13.

Approvals: cULus Listed (UL 203a) and FM Approved (FM 1950-10 & FM 1950-13). OSHPD Pre-Approved (OPM-0351-13 and OPA-2804-10). Complies with the hanging and bracing requirements listed in NFPA 13.

Features:

- Field adjustable to fit a wide range of beams.
- Centers the Fig. AF771 below the beam.

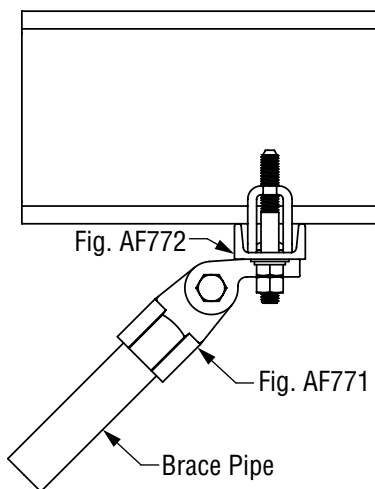
Installation Instructions:

- Move both c-clamps until they reach the outside of the slots.
- Place the adjustable steel beam attachment on the underside of the beam and adjust the c-clamps until they contact the outside edges of the beam flange. Hand tighten the c-clamp bolts.
- Torque each shear off set screw until the head shears off.
- Torque each c-clamp bolt to 55ft-lbs to secure the channel to the underside of the beam.
- Install the Fig. AF771 to the center mounting bolt. Installation angle determined by the brace angle of the AF771 and brace pipe.
- Fire Protection applications shall also be installed per the requirements of NFPA 13 and local codes.

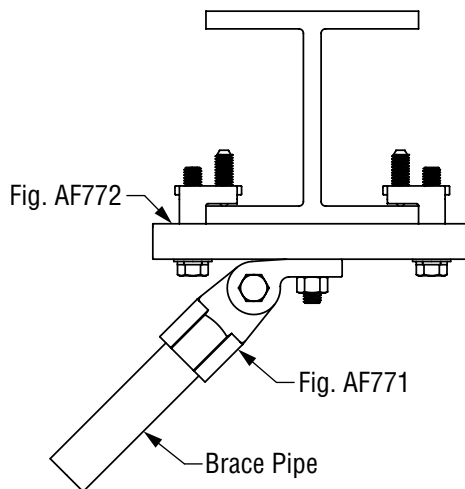
Ordering: Specify type, length, figure number, finish and description.



os hpd
OPM-0351-13



**Horizontal Steel Flange (I-Beam)
Seismic Load Parallel to Flange**



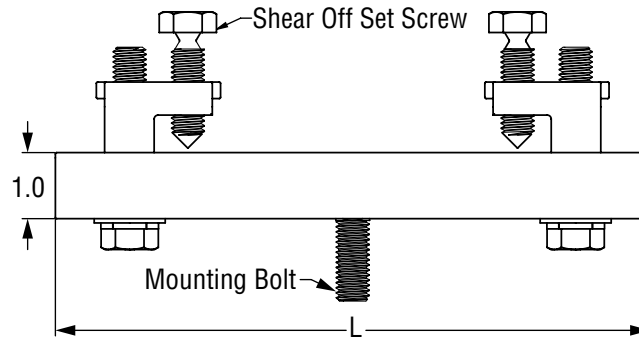
**Horizontal Steel Flange (I-Beam)
Seismic Load Perpendicular to Flange**

Notes: Anvil International® brand bracing components are designed to be compatible ONLY with other Anvil International® brand bracing components, resulting in a Listed seismic bracing assembly. Updated UL listing information may be viewed at www.ul.com and updated FM approval information may be viewed at www.approvalguide.com.

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Fig. AF772 (Formerly Anvil Fig. 772) Adjustable Steel Beam Attachment (cont.)



| FIG. AF772 cULus MAX SEISMIC LATERAL LOADS***: DIMENSIONS (IN) • LOADS (LBS) | | | | | | |
|--|------------|------------|------------------|--------------------------|------------------------|-----------------------|
| Type | Length (L) | Beam Width | Flange Thickness | Seismic Load Orientation | Max Seismic Brace Load | Max Service Pipe Size |
| A | 9 | 4 - 7 | $1/2 - 3/4$ | Parallel to Flange | 1000 | 4 |
| | | | | Perpendicular to Flange | 1600 | 6 |
| | 12 | 7 - 10 | | Parallel to Flange | 1000 | 4 |
| | | | | Perpendicular to Flange | 1600 | 6 |
| | 14 | 9 - 12 | | Parallel to Flange | 1000 | 4 |
| | | | | Perpendicular to Flange | 1600 | 6 |
| B | 9 | 4 - 7 | $3/4 - 1 1/4$ | Parallel to Flange | 1000 | 4 |
| | | | | Perpendicular to Flange | | |
| | 12 | 7 - 10 | | Parallel to Flange | | |
| | | | | Perpendicular to Flange | | |
| | 14 | 9 - 12 | | Parallel to Flange | | |
| | | | | Perpendicular to Flange | | |
| | 17 | 12 - 14 | | Parallel to Flange | | |
| | | | | Perpendicular to Flange | | |

| FIG. AF772 FM MAX SEISMIC LATERAL ASD LOADS***: DIMENSIONS (IN) • LOADS (LBS) • ANGLES (DEG) | | | | | | | | |
|--|------------|------------|------------------|--------------------------|--|-------|-------|-------|
| Type | Length (L) | Beam Width | Flange Thickness | Seismic Load Orientation | Max Seismic Brace Load at Brace Pipe Angle** | | | |
| | | | | | 30-40 | 45-59 | 60-74 | 75-90 |
| A | 9 | 4 - 7 | $3/8 - 3/4$ | Parallel to Flange | 470 | 480 | 580 | 640 |
| | | | | Perpendicular to Flange | 540 | 710 | 880 | 980 |
| | 12 | 7 - 10 | | Parallel to Flange | 470 | 480 | 580 | 640 |
| | | | | Perpendicular to Flange | 540 | 710 | 880 | 980 |
| | 14 | 9 - 12 | | Parallel to Flange | 470 | 480 | 580 | 640 |
| | | | | Perpendicular to Flange | 540 | 710 | 880 | 980 |
| B | 9 | 4 - 7 | $3/4 - 1 1/4$ | Parallel to Flange | 470 | 480 | 580 | 640 |
| | | | | Perpendicular to Flange | 540 | 710 | 880 | 980 |
| | 12 | 7 - 10 | | Parallel to Flange | 330 | 640 | 790 | 880 |
| | | | | Perpendicular to Flange | 470 | 740 | 910 | 1010 |
| | 14 | 9 - 12 | | Parallel to Flange | 330 | 640 | 790 | 880 |
| | | | | Perpendicular to Flange | 470 | 740 | 910 | 1010 |
| | 17 | 12 - 14 | | Parallel to Flange | 330 | 640 | 790 | 880 |
| | | | | Perpendicular to Flange | 470 | 740 | 910 | 1010 |

* Load rating for LW above refers to FM Approved lightwall pipe, commonly referred to as Sch.7 and Flow Pipe. See FM Approval Guide for approved lightwall pipe.

** Brace Pipe Angles are determined from vertical.

*** The allowable FM approved capacity of brace subassemblies are listed in Allowable Stress Design (ASD). For Load Resistance Factor Design (LRFD) capacities, the above values will need to be multiplied by 1.5.

Fig. AF772 (Formerly Anvil Fig. 772) Adjustable Steel Beam Attachment (cont.)

| FIG. AF772 I-BEAM SIZE CHART: DIMENSIONS (IN) | | | | | | | |
|---|--------|--------|---------|---------|--------|---------|---------|
| Type | A | | | | B | | |
| Length (L) | 9" | 12" | 14" | 17" | 12" | 14" | 17" |
| Beam Width | 4"-7" | 7"-10" | 9"-12" | 12"-15" | 7"-10" | 9"-12" | 12"-15" |
| Beam Size | W4x13 | W8x35 | W10x49 | W12x65 | W8x67 | W10x77 | W12x96 |
| | W5x16 | W8x40 | W10x54 | W12x72 | W21x93 | W10x88 | W12x106 |
| | W6x16 | W8x48 | W10x60 | W12x79 | W24x94 | W10x100 | W12x120 |
| | W6x20 | W10x39 | W10x68 | W14x90 | | W10x112 | W12x136 |
| | W8x21 | W10x45 | W12x58 | W14x99 | | W14x82 | W14x109 |
| | W8x24 | W10x49 | W12x65 | W24x104 | | W16x89 | W14x120 |
| | W10x22 | W12x40 | W14x61 | | | W16x100 | W14x132 |
| | W10x30 | W12x45 | W14x68 | | | W18x97 | W21x111 |
| | W12x26 | W12x50 | W16x67 | | | W18x106 | W21x122 |
| | W12x35 | W12x53 | W16x77 | | | W18x119 | W21x132 |
| | W14x30 | W12x58 | W18x76 | | | W24x94 | W21x147 |
| | W14x38 | W14x43 | W18x86 | | | W27x94 | W24x117 |
| | W16x26 | W14x48 | W24x84 | | | W27x114 | W24x131 |
| | W16x40 | W14x53 | W27x84 | | | | W24x146 |
| | W18x40 | W14x61 | W27x102 | | | | W24x162 |
| | W18x46 | W14x68 | | | | | W27x146 |
| | W21x50 | W16x45 | | | | | W27x161 |
| | W21x57 | W16x50 | | | | | W27x178 |
| | | W16x57 | | | | | |
| | | W18x50 | | | | | |
| | | W18x55 | | | | | |
| | | W18x60 | | | | | |
| | | W18x65 | | | | | |
| | | W21x62 | | | | | |
| | | W21x68 | | | | | |
| | | W21x73 | | | | | |
| | | W24x68 | | | | | |
| | | W24x76 | | | | | |
| | W27x84 | | | | | | |
| | W27x94 | | | | | | |

Fig. AF775 (Formerly Anvil Fig. 775) Longitudinal & Lateral Seismic Clamp

Size Range: Service Pipe: 2½" through 8", DN65 through DN200
 Brace Pipe: 1", 1¼", DN25, & DN32

Material: Carbon Steel Clamp and Ductile Iron Brace Socket
Finish: Plain or Galvanized (Brace Socket Electro-Galvanized per ASTM B633 and Clamps Hot-Dip Galvanized per ASTM A153)

Service: Designed to rigidly brace piping systems subjected to longitudinal and lateral seismic loads. May also be installed to brace piping systems subjected to vertical seismic loads. For vertical load capacities, reference OSHPD OPM-0351-13.

Approvals: cULus Listed (UL 203a) and FM Approved (FM 1950-10 & FM 1950-13). OSHPD Pre-Approved (OPM-0351-13 and OPA-2804-10). Complies with the hanging and bracing requirements listed in NFPA 13.

Features: For use in either longitudinal or lateral seismic brace applications.

Installation Instructions:

- Position the clamp at the desired location on the service pipe and hand tighten the hex bolts. Ensure the spacer and the brace socket attachment are positioned on the bolt between the pipe clamps ears.
- Insert brace pipe into the socket until the brace pipe bottoms out.
- Torque shear off bolt until the bolt head breaks off.
- Ensure the brace pipe is set to the desired installation brace angle.
- Tighten the clamp bolts and nuts equally and alternately until metal to metal contact is achieved with the proper torque value.
- Fire Protection applications shall also be installed per the requirements of NFPA 13 and local codes.

Ordering: Specify service pipe size, brace pipe size, figure number, finish and description.



osHPD
OPM-0351-13

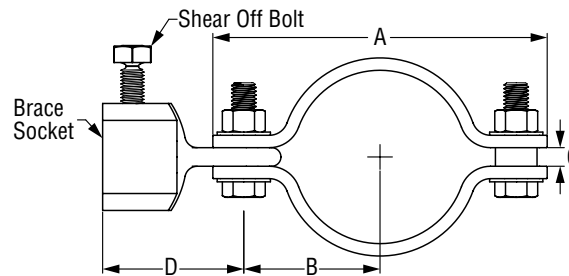


FIG. AF775: WEIGHT (LBS) • DIMENSIONS (IN) • WEIGHT (LBS) • TORQUE (FT-LBS)

| Service Pipe Size | A | B | C | D 1" Brace | D 1¼" Brace | Socket Depth | 1"/DN25 Brace Pipe Weight | 1¼"/DN50 Brace Pipe Weight | Installation Torque |
|-------------------|-----|----|-----|---------------|----------------|--------------|------------------------------|-------------------------------|---------------------|
| 2½ | 6 | 2¾ | ¾ | 2⅞ | 3 | 1⅜ | 2.19 | 2.54 | 80 |
| DN65 | 6⅛ | 2½ | | | | | 2.25 | 2.60 | |
| 3 (DN80) | 6¾ | 2¾ | | | | | 2.36 | 2.71 | |
| 4 (DN100) | 8½ | 3½ | | | | | 2.62 | 2.97 | |
| DN125 | 9½ | 4 | 7/8 | 2⅞ | 3 | 1⅜ | 3.74 | 4.09 | 100 |
| 5 | 9½ | 4 | | | | | 3.74 | 4.09 | |
| DN150 | 11¾ | 4⅞ | | | | | 6.32 | 6.67 | |
| 6 | 11½ | 4⅞ | | | | | 6.32 | 6.67 | |
| DN200 | 13¾ | 6 | 7/8 | 2⅞ | 3 | 1⅜ | 7.42 | 7.77 | 140 |
| 8 | 13¾ | 6 | | | | | 7.42 | 7.77 | |

Notes: Anvil International® brand bracing components are designed to be compatible ONLY with other Anvil International® brand bracing components, resulting in a Listed seismic bracing assembly. Updated UL listing information may be viewed at www.ul.com and updated FM approval information may be viewed at www.approvalguide.com.

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Fig. AF775 (Formerly Anvil Fig. 775)

Longitudinal & Lateral Seismic Clamp (cont.)

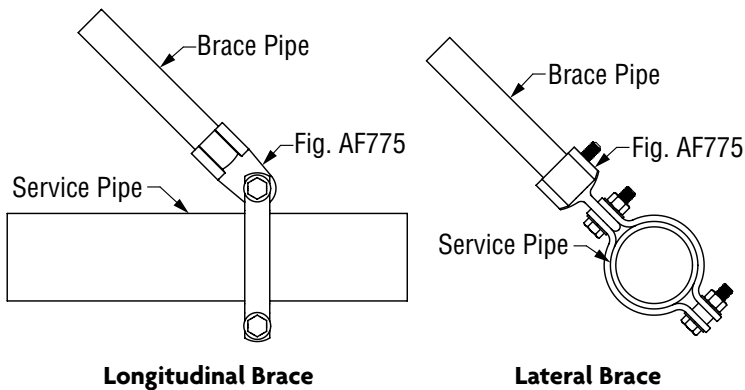


FIG. AF775 cULus MAX SEISMIC LATERAL LOADS: DIMENSIONS (IN) • LOADS (LBS)

| Service Pipe Size | Brace Pipe Size | Max Seismic Brace Load | |
|--------------------------|-------------------------|------------------------|---------|
| | | Sch. 10 | Sch. 40 |
| 2½ – 4 (DN65 - DN100) | 1 – 1¼ (DN25 - DN32) | 1000 | 1000 |
| 5 – 6 (DN125 - DN150) | | 1600 | 1600 |
| 8 (DN200) | | 2015 | 2015 |

NPS Brace Pipe Dimensions per ASTM A53 Sch. 40, ASTM A106 Sch. 40, or equivalent.
 NPS Service Pipe Dimensions per ASTM A53, ASTM A106 or equivalent.
 DN Service Pipe Dimensions per KS D 3507/3537 or equivalent listed with Sch. 10 loads.
 DN Service Pipe Dimensions per KS D 3562 Sch. 40 or Equivalent listed with Sch. 40 loads.
 DN Brace Pipe Dimensions per KS D 3562 Sch. 40 or equivalent.

FIG. AF775 FM MAX SEISMIC LATERAL ASD LOADS***: DIMENSIONS (IN) • LOADS (LBS) • ANGLES (DEG)

| Service Pipe Size | Pipe Schedules | Brace Pipe Size | Max Seismic Brace Load at Brace Pipe Angle** | | | | |
|-------------------|----------------|-------------------------|--|-------|-------|-------|------|
| | | | 30-44 | 45-59 | 60-74 | 75-90 | |
| 2½ | LW* | 1 – 1¼ (DN25 - DN32) | 1570 | 2220 | 1690 | 1870 | |
| DN65 | | | 1570 | 2220 | 1690 | 1870 | |
| 3 (DN80) | | | 1570 | 2220 | 1690 | 1870 | |
| 4 (DN100) | | | 1520 | 1060 | 910 | 1000 | |
| DN125 | | | 1570 | 2220 | 1690 | 1870 | |
| 5 | | | 1570 | 2220 | 1690 | 1870 | |
| DN150 | | | 1570 | 2220 | 910 | 1040 | |
| 6 | | | 1570 | 2220 | 910 | 1040 | |
| 2½ | | | Sch. 10 – Sch. 40 | 1370 | 2150 | 2390 | 2640 |
| DN65 | | | | 1370 | 2150 | 2390 | 2640 |
| 3 (DN80) | 1370 | | | 2150 | 2390 | 2640 | |
| 4 (DN100) | 1280 | | | 1810 | 1680 | 1870 | |
| DN125 | 1370 | | | 2150 | 2390 | 2640 | |
| 5 | 1370 | | | 2150 | 2390 | 2640 | |
| DN150 | 1520 | | | 2150 | 2570 | 2830 | |
| 6 | 1520 | | | 2150 | 2570 | 2830 | |
| DN200 | 1570 | 2220 | | 2720 | 3140 | | |
| 8 | 1570 | 2220 | | 2720 | 3140 | | |

NPS Brace Pipe Dimensions per ASTM A53 Sch. 40, ASTM A106 Sch. 40, or equivalent.

NPS Service Pipe Dimensions per ASTM A53, ASTM A106 or equivalent.

DN Service Pipe Dimensions per EN 10220, GB/T 8163, or equivalent listed with LW loads.

DN Service Pipe Dimensions per GB/T 3091, GB/T 3092, EN10255M, EN10255H, KS D 3507/3537, or equivalent listed with Sch. 10 loads.

DN Service Pipe Dimensions per JIS G3452, KS D 3562 Sch. 40 or equivalent listed with Sch. 40 loads.

DN Brace Pipe Dimensions per GB/T 3091, EN10255H, JIS G3454 Sch. 40, KS D 3562 Sch. 40, or equivalent.

* Load rating for LW above refers to FM Approved Lightwall pipe, commonly referred to as Sch.7 and Flow Pipe. See FM Approval Guide for approved Lightwall pipe.

** Brace Pipe Angles are determined from vertical.

*** The allowable FM approved capacity of brace subassemblies are listed in Allowable Stress Design (ASD). For Load Resistance Factor Design (LRFD) capacities, the above values will need to be multiplied by 1.5.

Fig. AF776 (Formerly Anvil Fig. 776)

OSHPD Lateral Brace Clamp

Size Range: Service Pipe: 2½" through 8" Carbon Steel
Brace Pipe: 1" or 1¼" Sch. 40

Material: Carbon steel

Finish: Plain or Electro-Galvanized per ASTM B633

Service: Designed to rigidly brace piping systems subjected to lateral seismic loads. May also be installed to brace piping systems subjected to vertical seismic loads. For vertical load capacities, reference OSHPD OPM-0351-13.

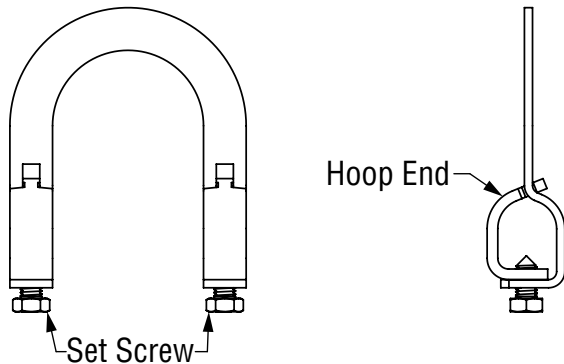
Approvals: FM Approved (FM 1950-10 & FM 1950-13). OSHPD Pre-Approved (OPM-0351-13 and OPA-2804-10). Complies with the hanging and bracing requirements listed in NFPA 13.

Features: Visual indication of proper assembly when the head of the set screw bottoms out on the hoop ends.

Installation Instructions:

- Place the OSHPD Lateral Brace Clamp over the service pipe to be braced and slide the Sch. 40 brace pipe through the hoop ends. The end of the brace pipe must extend at least 1" past the hoop ends.
- Note: The brace pipe may be installed above or below the service pipe.
- Ensure brace pipe is set to the desired installation brace angle.
- Torque the set screws alternately and equally until the head of the set screw bottoms out on the hoop ends.
- For riser/4-way brace installations, two OSHPD Lateral Brace Clamps must be installed within 6" of each other.
- Fire Protection applications shall also be installed per the requirements of NFPA 13 and local codes.

Ordering: Specify service pipe size, brace pipe size, figure number, finish and description.



| FIG. AF776: DIMENSIONS (IN) • WEIGHT (LBS) | | |
|--|---------------|----------------|
| Service Pipe Size | Weight | |
| | 1" Brace Pipe | 1¼" Brace Pipe |
| 2½ | 1.26 | 1.50 |
| 3 | 1.44 | 1.58 |
| 4 | 1.55 | 1.68 |
| 5 | 1.66 | 1.87 |
| 6 | 1.74 | 1.95 |
| 8 | 1.98 | 2.29 |

Notes: Anvil International® brand bracing components are designed to be compatible ONLY with other Anvil International® brand bracing components, resulting in a Listed seismic bracing assembly. Updated FM approval information may be viewed at www.approvalguide.com.

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Fig. AF776 (Formerly Anvil Fig. 776) OSHPD Lateral Brace Clamp (cont.)

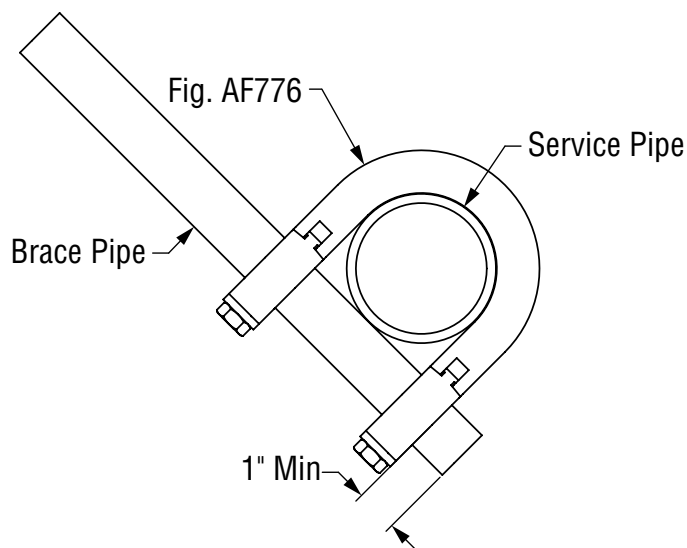


FIG. AF776 FM MAX SEISMIC LATERAL ASD LOADS*: DIMENSIONS (IN) • LOADS (LBS) • ANGLES (DEG)**

| Service Pipe Size | Brace Pipe Size | Pipe Schedules | Max Seismic Brace Load at Brace Pipe Angle** | | | |
|-------------------|-------------------|-------------------|--|-------|-------|-------|
| | | | 30-44 | 45-59 | 60-74 | 75-90 |
| 2½ | 1 – 1¼ | LW* | 600 | 850 | 1040 | 1160 |
| | | Sch. 10 – Sch. 40 | 620 | 880 | 1080 | 1200 |
| 3 | | LW* | 520 | 740 | 910 | 1010 |
| | | Sch. 10 – Sch. 40 | 620 | 880 | 1080 | 1200 |
| 4 | | LW* | 520 | 740 | 910 | 1010 |
| | | Sch. 10 – Sch. 40 | 690 | 980 | 1200 | 1340 |
| 5 | | LW* | 520 | 740 | 910 | 1010 |
| | | Sch. 10 – Sch. 40 | 670 | 940 | 1160 | 1290 |
| 6 | LW* | 560 | 790 | 970 | 1080 | |
| | Sch. 10 – Sch. 40 | 670 | 940 | 1160 | 1290 | |
| 8 | Sch. 10 – Sch. 40 | 540 | 770 | 940 | 1050 | |

* Load rating for LW above refers to FM Approved Lightwall pipe, commonly referred to as Sch.7 and Flow Pipe. See FM Approval Guide for approved Lightwall pipe.

** Brace Pipe Angles are determined from vertical.

*** The allowable FM approved capacity of brace subassemblies are listed in Allowable Stress Design (ASD). For Load Resistance Factor Design (LRFD) capacities, the above values will need to be multiplied by 1.5.

Fig. AF778 (Formerly Anvil Fig. 778) Universal Structural Brace Attachment

Size Range: Flange Thickness: Up to 3/4" thick

Material: Ductile Iron with Carbon Steel Hardware

Finish: Plain or Zinc Plated

Service: A seismic structural attachment designed to attach to steel I-beams, flanges, and joists. The Universal Structural Brace Attachment rigidly braces piping systems subjected to horizontal seismic loads. The Universal Structural Brace Attachment may also be installed to rigidly brace piping systems subjected to vertical seismic loads. For vertical load capacities, reference OSHPD OPM-0351-13.

Approvals: cULus Listed (UL 203a) and FM Approved (FM 1950-10 & FM 1950-13). OSHPD Pre-Approved (OPM-0351-13 and OPA-2804-10). Complies with the hanging and bracing requirements listed in NFPA 13.

Features:

- Shear off bolt provides a visual indication that the desired torque value has been achieved
- May be installed anywhere a Fig 92 standard throat beam clamp may be installed.

Installation Instructions:

- Place Universal Structural Brace Attachment on a horizontal or vertical steel flange.
- Torque shear off bolts evenly and equally until the head shears off.
- Install the 1/2" mounting bolt through the 1/2" AF771 mounting hole. The mounting bolt shall be installed wrench tight (typically finger tight plus 1/4 to 1/2 turns).
- Installation angle determined by the brace angle of the AF771 and brace pipe.
- Fire Protection applications shall also be installed per the requirements of NFPA 13 and local codes.

Ordering: Specify figure number, finish, and description.

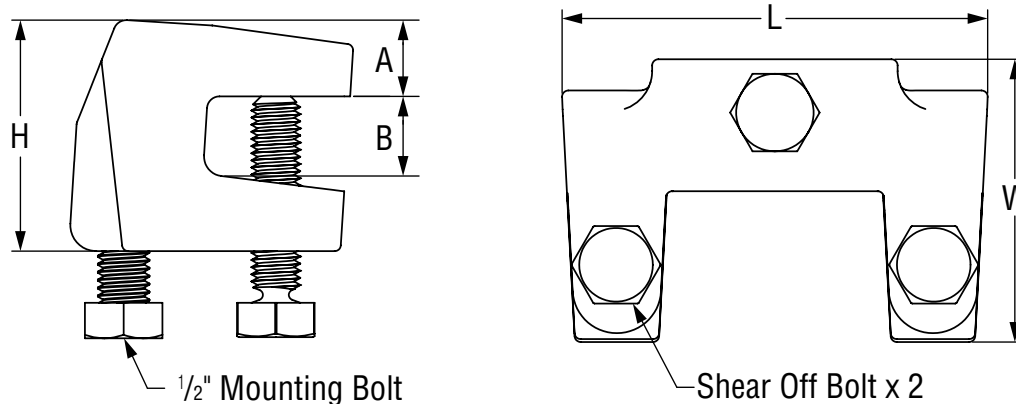
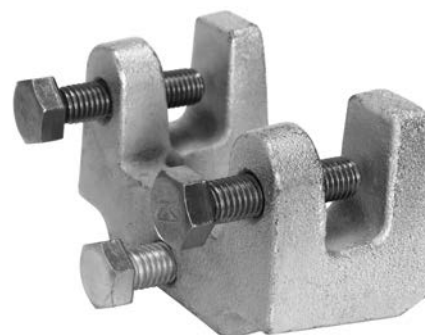


FIG. AF778: DIMENSIONS (IN) • WEIGHT (LBS)

| Mounting Bolt | L | W | H | A | B | Weight |
|---------------|-------|-------|-------|-----|-----|--------|
| 1/2 | 4 1/8 | 2 3/4 | 2 1/4 | 3/4 | 3/4 | 2.26 |

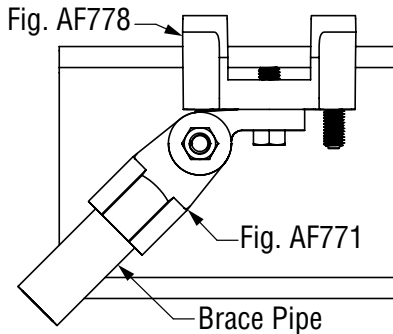
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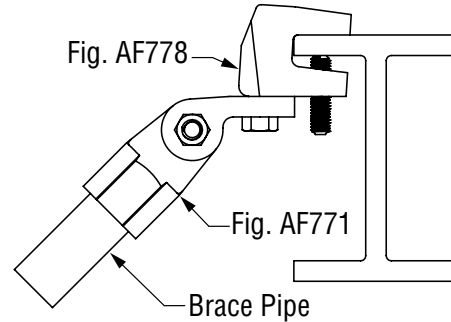
SeisBrace® Seismic Fire Protection Design Tool may be accessed at www.seisbrace.com

Fig. AF778 (Formerly Anvil Fig. 778)

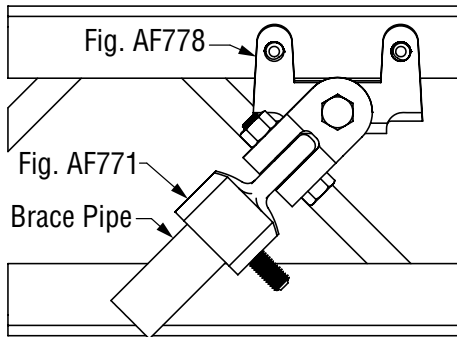
Universal Structural Brace Attachment (cont.)



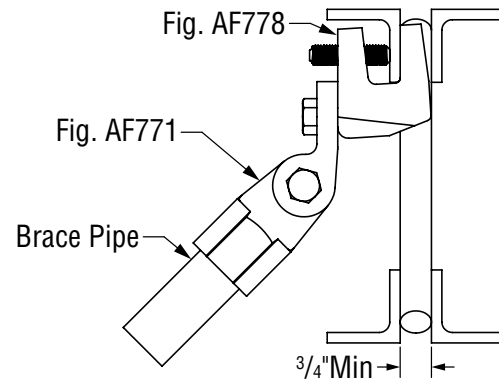
Horizontal Steel Flange
Seismic Load Parallel to Flange



Horizontal Steel Flange
Seismic Load Perpendicular to Flange



Vertical Steel Flange
Seismic Load Parallel to Flange



Vertical Steel Flange
Seismic Load Perpendicular to Flange

FIG. AF778 cULus MAX SEISMIC HORIZONTAL LOADS: DIMENSIONS (IN) • LOADS (LBS)

| Structure | Seismic Load Orientation | Min Flange Thickness | Max Seismic Brace Load | Max Service Pipe Size |
|---|--------------------------|----------------------|------------------------|-----------------------|
| Horizontal Steel Flange and Vertical Steel Flange | Parallel to Flange | $\frac{3}{16}$ | 1000 | 4 |
| | Perpendicular to Flange | | | |
| | Parallel to Flange | $\frac{1}{4}$ | 1600 | 6 |
| | Perpendicular to Flange | | | |
| | Parallel to Flange | $\frac{1}{2}$ | 2015 | 8 |
| | Perpendicular to Flange | | | |

FIG. AF778 FM MAX SEISMIC HORIZONTAL ASD LOADS: DIMENSIONS (IN) • LOADS (LBS) • ANGLES (DEG)**

| Structure | Seismic Load Orientation | Min Flange Thickness | Max Seismic Brace Load at Brace Pipe Angle* | | | |
|-------------------------|--------------------------|----------------------|---|-------|-------|-------|
| | | | 30-44 | 45-59 | 60-74 | 75-90 |
| Horizontal Steel Flange | Parallel to Flange | $\frac{1}{8}$ | 870 | 1440 | 1230 | 1360 |
| | Perpendicular to Flange | | 1030 | 2260 | 2490 | 2750 |
| Vertical Steel Flange | Parallel to Flange | | 1280 | 1840 | 2210 | 2470 |
| | Perpendicular to Flange | | 1570 | 1490 | 1040 | 1150 |

* Brace Pipe Angles are determined from vertical.

**The allowable FM approved capacity of brace subassemblies are listed in Allowable Stress Design (ASD). For Load Resistance Factor Design (LRFD) capacities, the above values will need to be multiplied by 1.5.

Fig. AF779 (Formerly Anvil Fig. 779 & Afcon Fig. 080) Multi-Connector Adapter

Size Range: Service Line: Up to 12"
 Fasteners: 1/2" through 3/4"
 Mounting Hole: 3/8" and 1/2"

Material: Carbon steel

Finish: Plain or Electro-Galvanized per ASTM B633

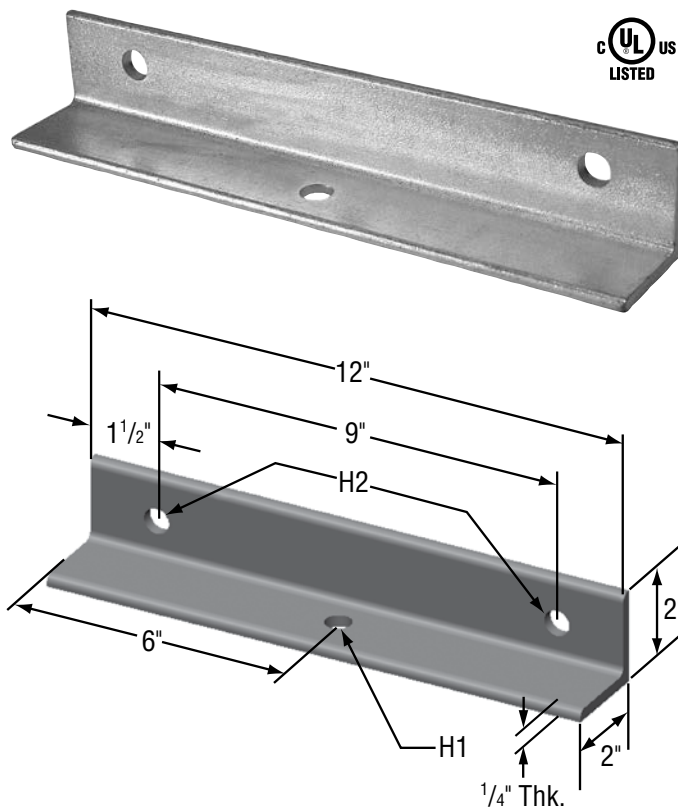
Service: Used to rigidly brace and restrain piping systems subjected to seismic loads. The multi-connector adapter distributes the load into the structure through two fasteners, maximizing the load capacity of the brace or restraint. For rigid brace assemblies, the multi-connector adapter may be installed in combination with Anvil's Fig. AF771, AF075, AF076, and AF077. For restraint assemblies, the multi-connector adapter may be installed in combination with Anvil's Fig. AF777.

Approvals: cULus Listed (UL 203a). Complies with the hanging and bracing requirements listed in NFPA 13.

Installation Instructions:

- Install two fasteners through the fastener holes (H2). Install per the fastener manufacturer's installation instructions.
- Install seismic brace or restraint through mounting hole (H1).
- Fire Protection applications shall also be installed per the requirements of NFPA 13 and local codes.

Ordering: Specify size, figure number, finish, and description.



| FIG. AF779 UL MAX LOAD: DIMENSIONS (IN) • LOADS (LBS) | | | | |
|--|---------------------------|--------------------------------------|-------------------------------|------------------------------------|
| Size | UL Max Seismic Brace Load | UL Max Service Pipe Size Rigid Brace | UL Max Seismic Restraint Load | UL Max Service Pipe Size Restraint |
| 1 | 3740 | 12 | 1000 | 2 |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |

| FIG. AF779: DIMENSIONS (IN) • WEIGHT (LBS) | | | | | |
|--|------------------------|------------------------|-------------|-------------|--------|
| Size | Mounting Bolt Diameter | Fastener (2X) Diameter | H1 Diameter | H2 Diameter | Weight |
| 1 | 3/8 | 1/2 | 7/16 | 9/16 | 3.06 |
| 2 | | | | | 3.06 |
| 3 | 1/2 | 5/8 | 9/16 | 11/16 | 3.04 |
| 4 | | 3/4 | | | 13/16 |

Notes: Anvil International® brand bracing components are designed to be compatible ONLY with other Anvil International® brand bracing components, resulting in a Listed seismic bracing assembly. Updated UL listing information may be viewed at www.ul.com

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Fig. AF090 (Formerly Anvil Fig. 89X & Afcon Fig. 160)

Restraining Strap

Size Range: $\frac{3}{8}$ " through $\frac{3}{4}$ " Threaded Rod

Material: Carbon Steel

Finish: Pre-Galvanized per ASTM A653

Service: Secures beam clamps to the beam where building movement is expected due to seismic activity. NFPA 13 requires the use of restraining straps in seismic areas. For use with Anvil Fig. 86, 88, 92, 93, 94, and 95 beam clamps.

Approvals: cULus Listed. Complies with the hanging and bracing requirements listed in NFPA 13.

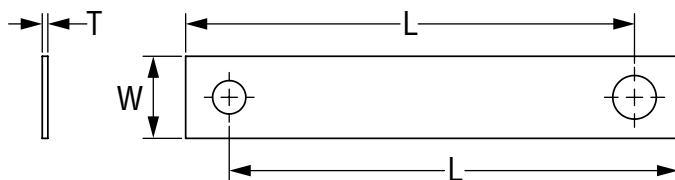
Features:

- Dual hole design allows for one part to be installed with $\frac{3}{8}$ " and $\frac{1}{2}$ " rod.
- Unique hook design allows for easy installation on existing piping systems.

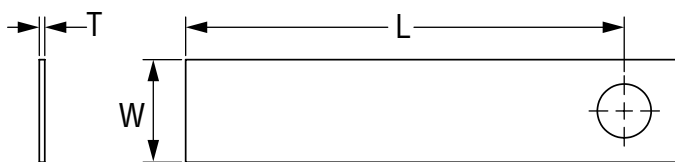
Installation Instructions:

- Install beam clamp per manufacture's installation instructions.
- Place restraining strap over exposed rod.
- Pull tight and wrap the opposite end of the restraining strap around the beam flange. At least 1" must wrap around the beam. For best performance, ensure the retrofit restraining strap is tight against the beam.
- For rod which extends less than 1" past the restraining strap, a nut must be installed to secure the restraining strap to the beam clamp and rod.
- Fire Protection applications shall also be installed per the requirements of NFPA 13 and local codes.

Ordering: Specify size, length, figure number and description.



$\frac{3}{8}$ " and $\frac{1}{2}$ " Combo Restraining Strap



$\frac{5}{8}$ " and $\frac{3}{4}$ " Restraining Strap

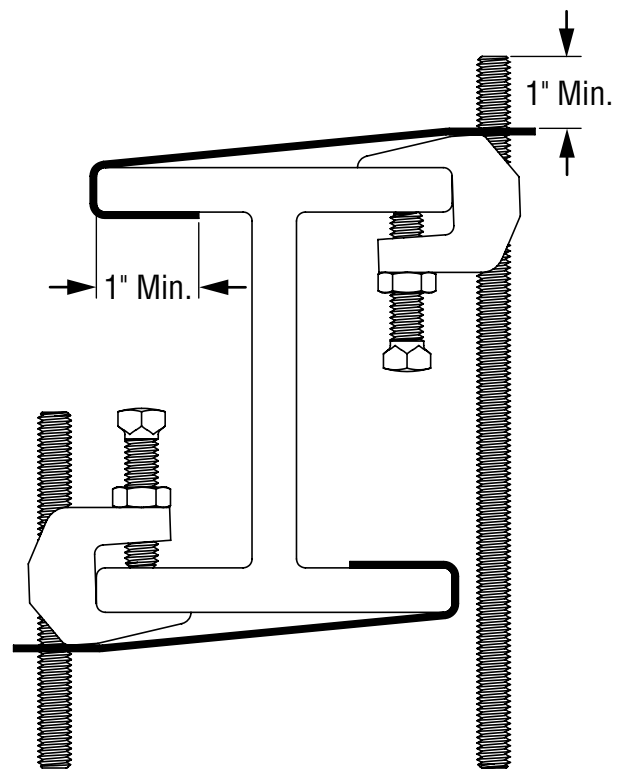


FIG. AF090: DIMENSIONS (IN)

| Rod Size | L Length | W Width | T Thickness |
|-------------------------------|--------------|----------------|-------------|
| $\frac{3}{8}$ & $\frac{1}{2}$ | 6, 8, 10, 12 | 1 | 15 ga. |
| $\frac{5}{8}$ | | $1\frac{1}{4}$ | 14 ga. |
| $\frac{3}{4}$ | | | |

Notes: Anvil International® brand bracing components are designed to be compatible ONLY with other Anvil International® brand bracing components, resulting in a Listed seismic bracing assembly. Updated UL listing information may be viewed at www.ul.com

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Fig. AF090R (Formerly Afcon Fig. 162)

Retrofit Restraining Strap

Size Range: $\frac{3}{8}$ " and $\frac{1}{2}$ " Threaded Rod

Material: Carbon Steel

Finish: Pre-Galvanized per ASTM A653

Service: Secures beam clamps to the beam where building movement is expected due to seismic activity. NFPA 13 requires the use of restraining straps in seismic areas. For use with Anvil Fig. 86, 88, 92, 93, and 95 beam clamps.

Approvals: cULus Listed. Complies with the hanging and bracing requirements listed in NFPA 13.

Features:

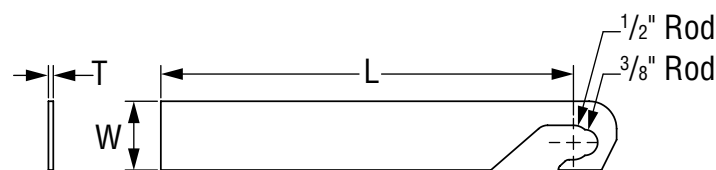
- Universal hook allows for installation on $\frac{3}{8}$ " and $\frac{1}{2}$ " rod.
- Unique hook design allows for easy installation on existing piping systems.

Installation Instructions:

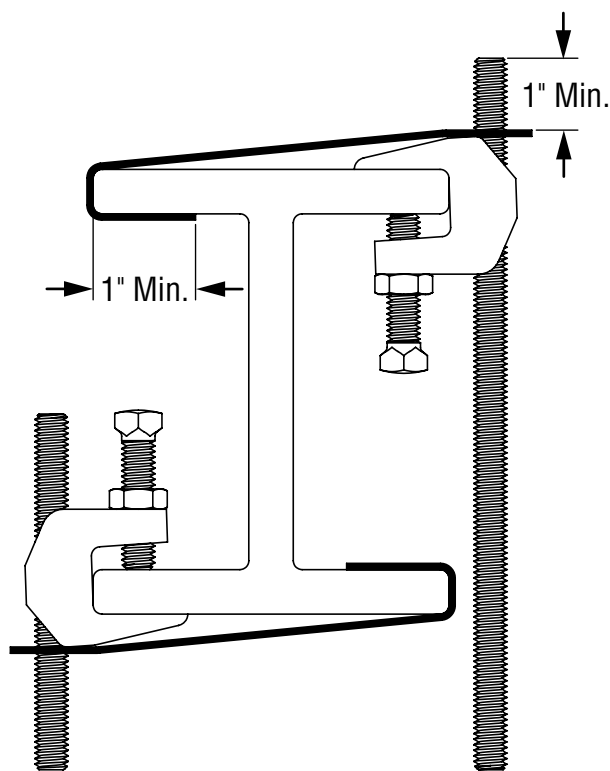
- Install beam clamp per manufacturer's installation instructions.
- Hook the end of the retrofit restraining strap around the rod or beam clamp set screw.
- Pull tight and wrap the opposite end of the retrofit restraining strap around the beam flange. At least 1" must wrap around the beam. For best performance, ensure the retrofit restraining strap is tight against the beam.
- For rod which extends less than 1" past the retrofit restraining strap, a nut must be installed to secure the retrofit restraining strap to the beam clamp and rod.
- Fire Protection applications shall also be installed per the requirements of NFPA 13 and local codes.

Patent: No. 5,897,088

Ordering: Specify size, length, figure number and description.



| FIG. AF090R: DIMENSIONS (IN) | | |
|------------------------------|------------|----------------|
| L Length | W Width | T Thickness |
| 6 | 1 | 15 ga. |
| 8 | | |
| 10 | | |
| 12 | | |



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Fig. AF310 (Formerly Afcon Fig. 310)

Surge Restrainer

Size Range: 1" thru 2" Figure 69, Swivel Ring Hanger

Material: Carbon steel

Finish: Pre-Galvanized per ASTM A653

Restrainer Service: Prevents vertical movement of horizontal sprinkler piping from thrust loads due to sprinkler activation. The surge restrainer is intended to be installed with Anvil's Figure 69 Swivel Ring Hanger.

Restraint Service: May be installed as part of a branch line seismic restraint assembly per the requirements of NFPA 13. The surge restrainer is intended to be installed with Anvil's Figure 69 Swivel Ring Hanger.

Approvals: cULus Listed (UL 203 and UL 203a). Complies with the hanging and restraint requirements listed in NFPA 13.

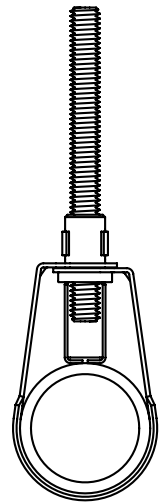
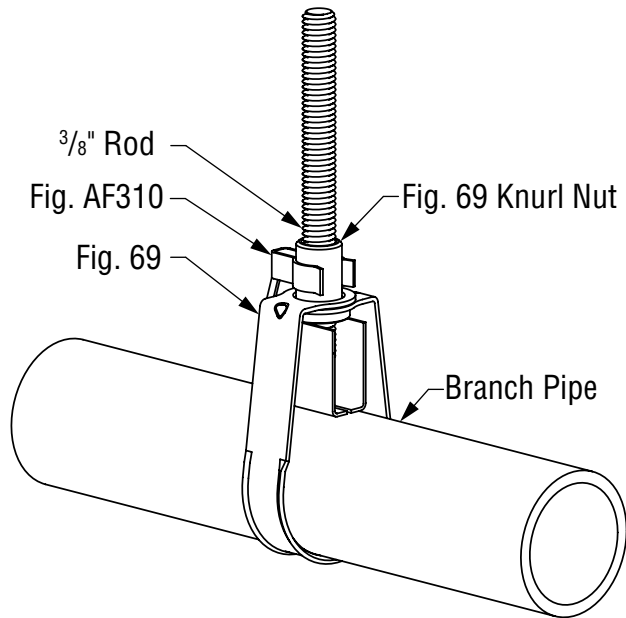
Features:

- One universal size accommodates Fig. 69 sizes 1" through 2".
- Simple design allows for quick installation on existing sprinkler systems.

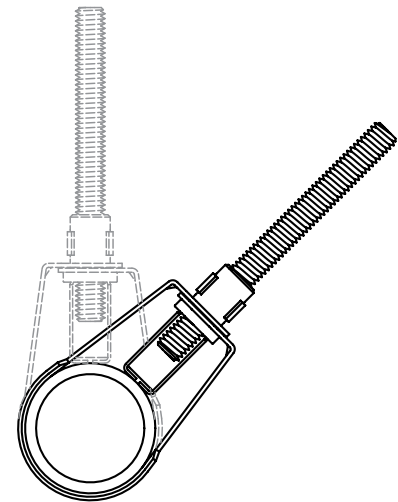
Installation Instructions:

- Snap surge restrainer onto the Fig. 69 knurl nut.
- The gap between the surge restrainer and service pipe shall not exceed 1/8".
- Fire Protection applications shall also be installed per the requirements of NFPA 13.

Ordering: Specify figure number and description.



Surge Restraint Assembly



Seismic Restraint Assembly

| FIG. AF310: DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS) | | | |
|---|-----------------|--|---------------------------|
| Service Pipe Size | Rod Size | UL Max Seismic Restraint Load (UL 203a) | Approx. Weight/100 |
| 1 thru 2 | 3/8 | 300 | 4 |

Notes: Anvil International® brand bracing components are designed to be compatible ONLY with other Anvil International® brand bracing components, resulting in a Listed seismic bracing assembly. Updated UL listing information may be viewed at www.ul.com

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Fig. AF773 (Formerly Anvil Fig. 773)

Surge Restrainer

Size Range: 3/4" thru 2" Figure 69, Swivel Ring Hanger

Material: Carbon steel

Finish: Pre-Galvanized per ASTM A653

Restrainer Service: Prevents vertical movement of horizontal sprinkler piping from thrust loads due to sprinkler activation. The surge restrainer is intended to be installed with Anvil's Figure 69 Swivel Ring Hanger.

Restraint Service: May be installed as part of a branch line seismic restraint assembly per the requirements of NFPA 13. The surge restrainer is intended to be installed with Anvil's Figure 69 Swivel Ring Hanger.

Approvals: cULus Listed (UL 203 and UL 203a). Complies with the hanging and restraint requirements listed in NFPA 13.

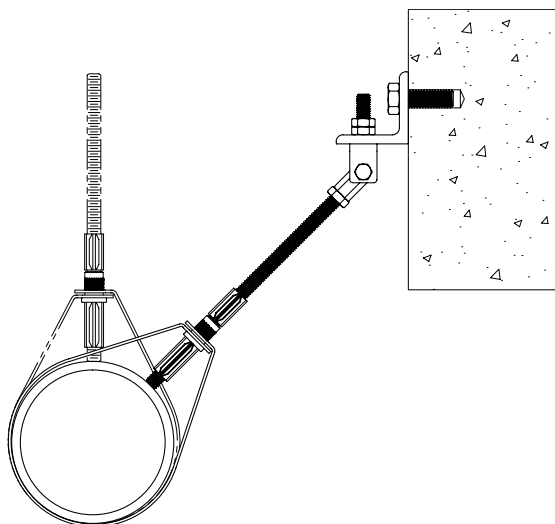
Features:

- One universal size accommodates Figure 69 sizes 3/4" through 2".
- Simple design allows for quick installation on existing sprinkler systems.

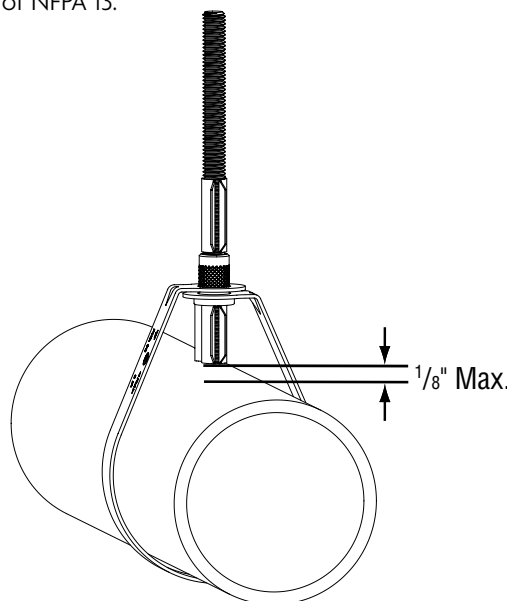
Installation Instructions:

- Install hanger rod or restraint rod a minimum of 1/2" beyond the bottom of the Figure 69 knurl nut.
- Snap surge restrainer onto the threaded rod above and below the knurl nut.
- The gap between the surge restrainer and service pipe shall not exceed 1/8".
- Fire Protection applications shall also be installed per the requirements of NFPA 13.

Ordering: Specify figure number and description.



Branch Line Restraint Assembly



| FIG. AF773: DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS) | | | |
|---|----------|---|--------------------|
| Service Pipe Size | Rod Size | UL Max Seismic Restraint Load (UL 203a) | Approx. Weight/100 |
| 3/4 thru 2 | 3/8 | 300 | 4 |

Notes: Anvil International® brand bracing components are designed to be compatible ONLY with other Anvil International® brand bracing components, resulting in a Listed seismic bracing assembly. Updated UL listing information may be viewed at www.ul.com

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Fig. AF777 (Formerly Anvil Fig. 777 & Afcon Fig. 615)

Swivel Attachment

Size Range: 3/8" through 1/2" rod

Material: Carbon Steel

Finish: Electro-Galvanized per ASTM B633

Hanger Service: Swivel hanger designed to support horizontal piping from angled structures. Listed for installation at angles between 0 and 90 degrees.

Restraint Service: May be installed as a branch line restraint per the requirements of NFPA 13. The AF777 may be installed directly to the structure or to the Fig. AF779.

Approvals: cULus Listed (UL 203 and UL 203a – 3/8" only). Complies with the hanging and restraint requirements listed in NFPA 13.

Installation:

- Install mounting bolt into structure or structural attachment and tighten hex nut until the yoke (U-Shaped Bracket) is tight against the structure or attachment.
- Thread the hanger rod or restraint rod into the hex union until it bottoms. Back rod off a maximum of one turn to allow the hex union to swivel freely.
- Adjust angle as necessary.
- If the AF777 is exposed to vibration from the piping system or the structure, jam nuts may be installed on the mounting bolt and the threaded rod.
- Fire Protection applications shall also be installed per NFPA 13 requirements.

Features: Full 90 degree rotation allows for installation at any angle.

Ordering: Specify figure number, finish, size, and description.

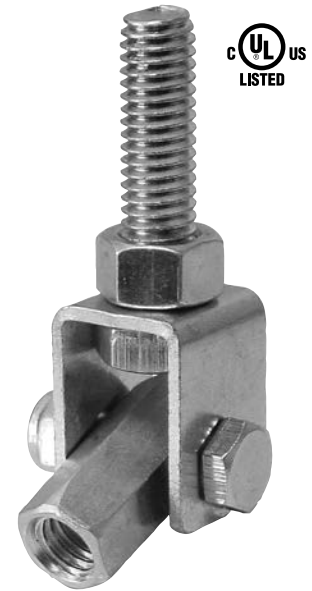
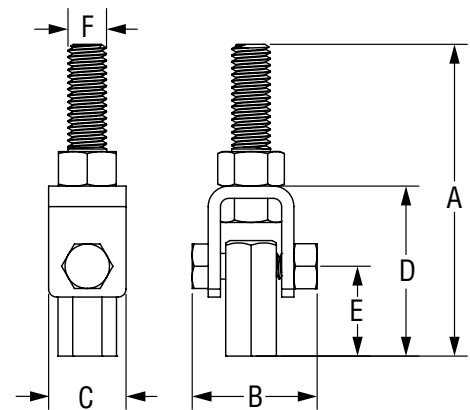


FIG. AF777: DIMENSIONS (IN)

| Rod Size | A | B | C | D | E | F |
|----------|-------|-------|--------|---------|-----|-----|
| 3/8 | 3 | 1 3/8 | 3/4 | 1 5/8 | 7/8 | 3/8 |
| 1/2 | 3 5/8 | 1 1/2 | 1 1/16 | 1 13/16 | 7/8 | 1/2 |

FIG. AF777: DIMENSIONS (IN) • LOADS (LBS)

| Rod Size | UL Max Hanger Load (UL 203) | UL Max Seismic Restraint Load (UL 203a) | Max Hanger Load |
|----------|-----------------------------|---|-----------------|
| 3/8 | Up to 4" Pipe | 1,000 | 250 |
| 1/2 | Up to 8" Pipe | n/a | n/a |



Notes: Anvil International® brand bracing components are designed to be compatible ONLY with other Anvil International® brand bracing components, resulting in a Listed seismic bracing assembly. Updated UL listing information may be viewed at www.ul.com

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Pipe Hanger Specifications

1. SCOPE

This specification shall apply for the design and fabrication of all hangers, supports, anchors, and guides. Where piping design is such that exceptions to this specification are necessary, the particular system will be identified, and the exceptions clearly listed through an addendum which will be made a part of the specification.

2. DESIGN

- (a) All supports and parts shall conform to the latest requirements of the ASME Code for Pressure Piping B31.1 and MSS Standard Practice SP-58, SP-69, SP-89 and SP-90 except as supplemented or modified by the requirements of this specification.
- (b) Threads are UNC and conform to ANSI/ASME B1.1 unless otherwise specified.
- (c) Designs generally accepted as exemplifying good engineering practice, using stock or production parts, shall be utilized wherever possible.
- (d) Accurate weight balance calculations shall be made to determine the required supporting force at each hanger location and the pipe weight load at each equipment connection.
- (e) Pipe hangers shall be capable of supporting the pipe in all conditions of operation. They shall allow free expansion and contraction of the piping, and prevent excessive stress resulting from transferred weight being introduced into the pipe or connected equipment.
- (f) Wherever possible, pipe attachments for horizontal piping shall be pipe clamps.
- (g) For critical high-temperature piping, at hanger locations where the vertical movement of the piping is $\frac{1}{2}$ " or more, or where it is necessary to avoid the transfer of load to adjacent hangers or connected equipment, pipe hangers shall be an approved constant support design, as Anvil Fig. 80-V and Fig. 81-H Constant Support Hangers, or equal.

Where transfer of load to adjacent hangers or equipment is not critical, and where the vertical movement of the piping is less than $\frac{1}{2}$ ", Variable Spring Hangers may be used, provided the variation in supporting effect does not exceed 25% of the calculated piping load through its total vertical travel.

- (h) The total travel for Constant Support Hangers will be equal to actual travel plus 20%. In no case will the difference between actual and total travel be less than 1". The Constant Support Hanger will have travel scales on both sides of the support frame to accommodate inspections.
- (i) Constant Support Hanger should be individually calibrated before shipment to support the exact load specified. The calibration record of constant support shall be maintained for a period of 20 years to assist the customer in any redesign of the piping system. Witness marks shall be stamped on the Load Adjustment Scale to establish factory calibration reference point.
- (j) In addition to the requirements of ASTM A125 all alloy springs shall be shot peened and examined by magnetic particle. The spring rate tolerance shall be $\pm 5\%$. All three critical parameters (free height, spring rate and loaded height) of spring coils must be tested for. Each spring coiled must be purchased with a C.M.T.R. and be of domestic manufacture.
- (k) Constant Supports should have a wide range of load adjustability. No less than 10% of this adjustability should be provided either side of the calibrated load for plus or minus field adjustment. Load adjustment scale shall be provided to aid the field in accurate adjustment of loads. Additionally, the constant support should be designed so that load adjustments can be made with-out use of special tools and not have an impact on the travel capabilities of the supports.
- (l) Constant Supports shall be furnished with travel stops which shall prevent upward and downward movement of the hanger. The travel stops will be factory installed so that the hanger level is at the "cold" position. The travel stops will be of such design as to permit future re-engagement, even in the event the lever is at a position other than "cold", without having to make hanger adjustments.
- (m) For non-critical, low temperature systems, where vertical movements up to 2" are anticipated, an approved precompressed Variable Spring design similar to Anvil Fig. B- 268 may be used. Where movements are of a small magnitude, spring hangers similar to Anvil Fig. 82 may be used.
- (n) Each Variable Spring shall be individually calibrated at the factory and furnished with travel stops. Spring coils must be square to within 1° to insure proper alignment. Each spring coil must be purchased with a C.M.T.R. and be of domestic manufacture.
- (o) All rigid rod hangers shall provide a means of vertical adjustment after erection.
- (p) Where the piping system is subject to shock loads, such as seismic disturbances or thrusts imposed by the actuation of safety valves, hanger design shall include provisions for rigid restraints or shock absorbing devices of approved design, such as Anvil Fig. 200 shock and sway suppressor, or equal.

Pipe Hanger Specifications

- (q) Selection of vibration control devices shall not be part of the standard hanger contract. If vibration is encountered after the piping system is in operation, appropriate vibration control equipment shall be installed.
- (r) Hanger rods shall be subject to tensile loading only (see page 288). At hanger locations where lateral or axial movement is anticipated, suitable linkage shall be provided to permit swing.
- (s) Where horizontal piping movements are greater than $\frac{1}{2}$ " and where the hanger rod angularly from the vertical is less than or equal to 4 degrees from the cold to hot position of the pipe, the hanger pipe and structural attachments shall be offset in such manner that the rod is vertical in the hot position. When the hanger rod angularity is greater than 4 degrees from vertical, then structural attachment will be offset so that at no point with the rod angularity exceed 4 degrees from vertical.
- (t) Hangers shall be spaced in accordance with Table 1 and Table 2 on page 280.
- (u) Where practical, riser piping shall be supported independently of the connected horizontal piping. Pipe support attachments to the riser piping shall be riser clamp lugs. Welded attachments shall be of material comparable to that of the pipe, and designed in accordance with governing codes.
- (v) Supports, guides, and anchors shall be so designed that excessive heat will not be transmitted to the building steel. The temperature of supporting parts shall be based on a temperature gradient of 100F° per inch distance from the outside surface of the pipe.
- (w) Hanger components shall not be used for purposes other than for which they were designed. They shall not be used for rigging and erection purposes.
- (x) Hydraulic Snubbers - The hydraulic units shall have a temperature stable control valve. The valve shall provide a locking and bleed rate velocity that provides for tamper proof settings. The fluid level indicator for exact reading of reservoir fluid level in any snubber orientation.

The valve device shall offer a minimum amount of resistance to thermal movement. Any shock force shall cause the suppressor valve to close. With the suppressor valve closed the fluid flow shall essentially stop, thereby causing the unit to resist and absorb the disturbing forces. After the disturbing forces subside, the suppressor valve shall open again to allow free thermal movement of the

piping. The suppressor shall have a means of regulating the amount of movement under shock conditions up to the design load for faulted conditions without release of fluid. The suppressor design shall include a fluid bleed system to assure continued free thermal movement after the shock force subsides. The suppressor shall have a hard surfaced, corrosion resistant piston rod supported by a rod bushings and shall be designed so that it is capable of exerting the required force in tension and compression, utilizing the distance.

- (y) Paint - Variable Spring and Constant Support units will be furnished painted with Stewart Bros. Green Semi-Gloss Primer (#12979B). All other material will receive one shop coat of a red chromate primer meeting the requirements of Federal Specification TT-P-636.

For corrosive conditions hangers will be galvanized or painted with carbo-zinc #11.

Hanger Design Service

Hanger for piping $2\frac{1}{2}$ " and larger, and all spring support for assemblies, shall be completely engineered.

- (a) Engineered hanger assemblies shall be detailed on $8\frac{1}{2}$ " x 11" sheets.

Each sketch will include a location plan showing the location of the hanger in relation to columns of equipment.

Each sketch will include an exact bill of material for the component parts making up each assembly.

- (b) Each engineered hanger assembly will be individually bundled and tagged as far as practical, ready for installation.

Hanger material for piping 2" and smaller shall be shipped as loose material, identified by piping system only. A piping drawing marked with approximate hanger locations and types, and hanger sketches showing typical support arrangements will be furnished.

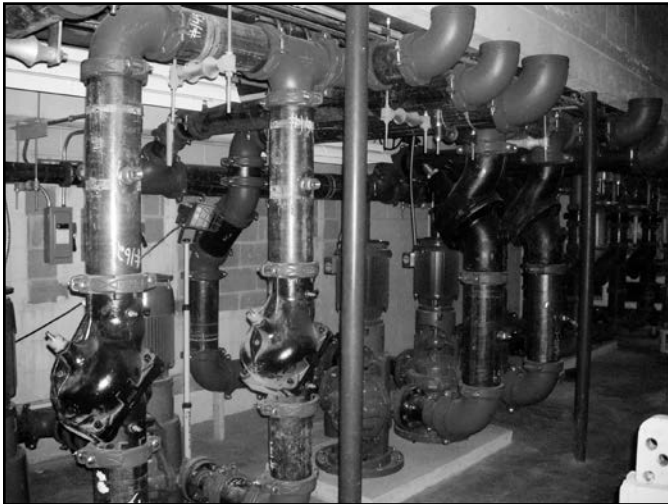
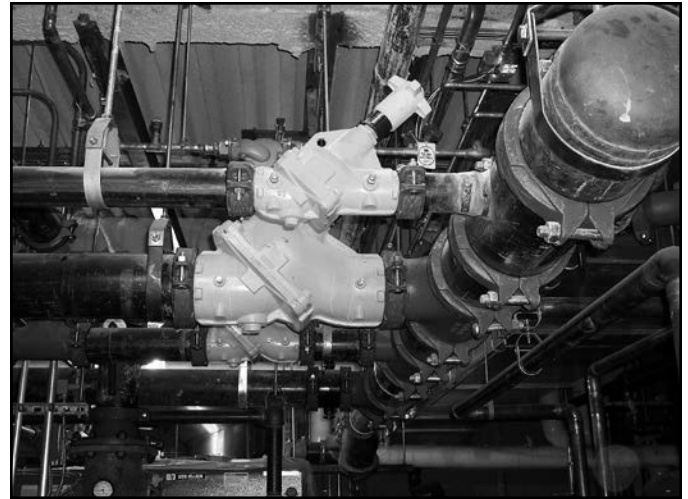
- (c) Hanger inspections shall be performed in accordance with MSS-SP-89 (Section 7.7), ASME B31.1 (Appendix V), and ASME Section III Subsection NF (NF-5000).

Master Format 3 Part Specification

Anvil international provides our customers with master specification formats for a wide range of piping construction needs. Anvil's customers can utilize our specifications to help update and revise their current internal building specifications. These master specifications include a three part format; Part 1: General, Part 2: Product, & Part 3: Execution that included the complete catalog of Anvil products.

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- Basic Mechanical Methods and Materials
- Hanger & Supports
- Pipes, Valves, & Fittings for Fire Protection
- Pipes, Valves, & Fittings for Plumbing Systems
- Pipes, Valves, & Fittings for HVAC Heating and Cooling Systems



All Master Format Specification are available for download in WORD and PDF format.

Please follow the web address below for download links.

<http://www.anvilintl.com/engineering-resources/master-specifications.aspx>

TECHNICAL DATA

Pipe Support Spacing

TABLE 1: MAXIMUM HORIZONTAL SPACING BETWEEN PIPE SUPPORTS FOR STANDARD WEIGHT STEEL PIPE*

| | Nominal Pipe Size (in) | | | | | | | | | | | | | | | | | | | | | |
|-------------------------------------|------------------------|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| | ½ | ¾ | 1 | 1½ | 2 | 2½ | 3 | 3½ | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 24 | 30 | | |
| Max. Span (Ft) Water Service | 7 | 7 | 7 | 9 | 10 | 11 | 12 | 13 | 14 | 16 | 17 | 19 | 22 | 23 | 25 | 27 | 28 | 30 | 32 | 33 | | |
| Max. Span (Ft) Vapor Service | 8 | 9 | 9 | 12 | 13 | 14 | 15 | 16 | 17 | 19 | 21 | 24 | 26 | 30 | 32 | 35 | 37 | 39 | 42 | 44 | | |
| Recommended Hanger Rod Sizes | ¾ | | | ½ | | | ⅝ | | | ¾ | | | ⅞ | | | 1 | | | 1 | 1¼ | 1½ | 1½ |
| | or trapeze | | | | | | | | | | | | | | | | | | | | | |

The above spacing and capacities are based on pipe filled with water. Additional valves and fittings increase the load and therefore closer hanger spacing is required.

*Many codes and specifications state "pipe hangers must be spaced every 10ft. regardless of size." This local specification must be followed.

TABLE 2: MAXIMUM HORIZONTAL SPACING BETWEEN COPPER TUBING SUPPORTS

| | Nominal Tubing Size (in) | | | | | | | | | |
|-------------------------------------|--------------------------|---|---|----|----|----|----|----|----|----|
| | ½ | ¾ | 1 | 1¼ | 1½ | 2 | 2½ | 3 | 3½ | 4 |
| Max. Span (Ft) Water Service | 5 | 5 | 6 | 7 | 8 | 8 | 9 | 10 | 11 | 12 |
| Max. Span (Ft) Vapor Service | 6 | 7 | 8 | 9 | 10 | 11 | 13 | 14 | 15 | 16 |

Note: Spans shown in Tables 1 and 2 do not apply where there are concentrated loads between supports or where temperatures exceed 750°F.

TABLE 3: CPVC PIPE SUPPORT SPACING

| Pipe Size (In.) | Schedule 40 Temperature (°F) | | | | | | Schedule 80 Temperature (°F) | | | | | |
|-----------------|------------------------------|------|------|------|------|------|------------------------------|------|------|------|------|------|
| | 73° | 100° | 120° | 140° | 160° | 180° | 73° | 100° | 120° | 140° | 160° | 180° |
| ½ | 5 | 4½ | 4½ | 4 | 2½ | 2½ | 5½ | 5 | 4½ | 4½ | 3 | 2½ |
| ¾ | 5 | 5 | 4½ | 4 | 2½ | 2½ | 5½ | 5½ | 5 | 4½ | 3 | 2½ |
| 1 | 5½ | 5½ | 5 | 4½ | 3 | 2½ | 6 | 6 | 5½ | 5 | 3½ | 3 |
| 1¼ | 5½ | 5½ | 5½ | 5 | 3 | 3 | 6½ | 6 | 6 | 5½ | 3½ | 3 |
| 1½ | 6 | 6 | 5½ | 5 | 3½ | 3 | 7 | 6½ | 6 | 5½ | 3½ | 3½ |
| 2 | 6 | 6 | 5½ | 5 | 3½ | 3 | 7 | 7 | 6½ | 6 | 4 | 3½ |
| 2½ | 7 | 7 | 6½ | 6 | 4 | 3½ | 8 | 7½ | 7½ | 6½ | 4½ | 4 |
| 3 | 7 | 7 | 7 | 6 | 4 | 3½ | 8 | 8 | 7½ | 7 | 4½ | 4 |
| 3½ | 7½ | 7½ | 7 | 6½ | 4 | 4 | 8½ | 8½ | 8 | 7½ | 5 | 4½ |
| 4 | 7½ | 7½ | 7 | 6½ | 4½ | 4 | 8½ | 9 | 8½ | 7½ | 5 | 4½ |
| 6 | 8½ | 8 | 7½ | 7 | 5 | 4½ | 10 | 9½ | 9 | 8 | 5½ | 5 |
| 8 | 9½ | 9 | 8½ | 7½ | 5½ | 5 | 11 | 10½ | 10 | 9 | 6 | 5½ |
| 10 | 10½ | 10 | 9½ | 8 | 6 | 5½ | 11½ | 11 | 10½ | 9½ | 6½ | 6 |
| 12 | 11½ | 10½ | 10 | 8½ | 6½ | 6 | 12½ | 12 | 11½ | 10½ | 7½ | 6½ |
| 14 | 12 | 11 | 10 | 9 | 8 | 6 | 15 | 13½ | 12½ | 11 | 9½ | 8 |
| 16 | 13 | 12 | 11 | 9½ | 8½ | 7 | 16 | 15 | 13½ | 12 | 10 | 8½ |

Note: Although support spacing is shown at 140°F, consideration should be given to the use of CPVC or continuous support above 120°F.

The possibility of temperature overrides beyond regular working temperatures and cost may either make either of the alternatives more desirable. This chart based on continuous spans and for un-insulated line carrying fluids of specific gravity up to 1.00.

The above table is meant as a general guideline, it is recommended that the pipe manufacturer be consulted for specific spacing recommendations relating to their pipe, load conditions, operating temperature and service conditions.

Local codes and specifications may also vary from the above recommended spacing and should be consulted for the applicable spacing requirements prior to installation.

Pipe Support Spacing – PVC

| Pipe Size (In.) | Schedule 40 Temperature (°F) | | | | | Schedule 80 Temperature (°F) | | | | | Schedule 120 Temperature (°F) | | | | |
|-----------------|------------------------------|-----|-----|-----|-----|------------------------------|-----|-----|-----|-----|-------------------------------|-----|-----|-----|-----|
| | 60 | 80 | 100 | 120 | 140 | 60 | 80 | 100 | 120 | 140 | 60 | 80 | 100 | 120 | 140 |
| ¼ | 4 | 3½ | 3½ | 2 | 2 | 4 | 4 | 3½ | 2½ | 2 | – | – | – | – | – |
| ⅜ | 4 | 4 | 3½ | 2½ | 2 | 4½ | 4½ | 4 | 2½ | 2½ | – | – | – | – | – |
| ½ | 4½ | 4½ | 4 | 2½ | 2½ | 5 | 4½ | 4½ | 3 | 2½ | 5 | 5 | 4½ | 3 | 2½ |
| ¾ | 5 | 4½ | 4 | 2½ | 2½ | 5½ | 5 | 4½ | 3 | 2½ | 5½ | 5 | 4½ | 3 | 3 |
| 1 | 5½ | 5 | 4½ | 3 | 2½ | 6 | 5½ | 5 | 3½ | 3 | 6 | 5½ | 5 | 3½ | 3 |
| 1¼ | 5½ | 5½ | 5 | 3 | 3 | 6 | 6 | 5½ | 3½ | 3 | 6½ | 6 | 5½ | 3½ | 3½ |
| 1½ | 6 | 5½ | 5 | 3½ | 3 | 6½ | 6 | 5½ | 3½ | 3½ | 6½ | 6½ | 6 | 4 | 3½ |
| 2 | 6 | 5½ | 5 | 3½ | 3 | 7 | 6½ | 6 | 4 | 3½ | 7½ | 7 | 6½ | 4 | 3½ |
| 2½ | 7 | 6½ | 6 | 4 | 3½ | 7½ | 7½ | 6½ | 4½ | 4 | 8 | 7½ | 7 | 4½ | 4 |
| 3 | 7 | 7 | 6 | 4 | 3½ | 8 | 7½ | 7 | 4½ | 4 | 8½ | 8 | 7½ | 5 | 4½ |
| 3½ | 7½ | 7 | 6½ | 4 | 4 | 8½ | 8 | 7½ | 5 | 4½ | 9 | 8½ | 7½ | 5 | 4½ |
| 4 | 7½ | 7 | 6½ | 4½ | 4 | 9 | 8½ | 7½ | 5 | 4½ | 9½ | 9 | 8½ | 5½ | 5 |
| 5 | 8 | 7½ | 7 | 4½ | 4 | 9½ | 9 | 8 | 5½ | 5 | 10½ | 10 | 9 | 6 | 5½ |
| 6 | 8½ | 8 | 7½ | 5 | 4½ | 10 | 9½ | 9 | 6 | 5 | 11½ | 10½ | 9½ | 6½ | 6 |
| 8 | 9 | 8½ | 8 | 5 | 4½ | 11 | 10½ | 9½ | 6½ | 5½ | – | – | – | – | – |
| 10 | 10 | 9 | 8½ | 5½ | 5 | 12 | 11 | 10 | 7 | 6 | – | – | – | – | – |
| 12 | 11½ | 10½ | 9½ | 6½ | 5½ | 13 | 12 | 10½ | 7½ | 6½ | – | – | – | – | – |
| 14 | 12 | 11 | 10 | 7 | 6 | 13½ | 13 | 11 | 8 | 7 | – | – | – | – | – |
| 16 | 12½ | 11½ | 10½ | 7½ | 6½ | 14 | 13½ | 11½ | 8½ | 7½ | – | – | – | – | – |
| 18 | 13 | 12 | 11 | 8 | 7 | 14½ | 14 | 12 | 11 | 9 | – | – | – | – | – |
| 20 | 14 | 12½ | 11½ | 10 | 8½ | 15½ | 14½ | 12½ | 11½ | 9½ | – | – | – | – | – |
| 24 | 15 | 13 | 12½ | 11 | 9½ | 17 | 15 | 14 | 12½ | 10½ | – | – | – | – | – |
| | SDR 41 | | | | | SDR 26 | | | | | – | | | | |
| 18 | 13 | 12 | 11 | 8 | 7 | 14½ | 14 | 12 | 9 | 8 | – | – | – | – | – |
| 20 | 13½ | 12½ | 11½ | 8½ | 7½ | 15 | 14½ | 12½ | 9½ | 8½ | – | – | – | – | – |
| 24 | 14 | 13 | 12 | 9 | 8 | 15½ | 15 | 13 | 10 | 9 | – | – | – | – | – |

Note: Although support spacing is shown at 140°F, consideration should be given to the use of CPVC or continuous support above 120°F.

The possibility of temperature overrides beyond regular working temperatures and cost may either make either of the alternatives more desirable. This chart based on continuous spans and for un-insulated line carrying fluids of specific gravity up to 1.00.

The above table is meant as a general guideline, it is recommended that the pipe manufacturer be consulted for specific spacing recommendations relating to their pipe, load conditions, operating temperature and service conditions.

Local codes and specifications may also vary from the above recommended spacing and should be consulted for the applicable spacing requirements prior to installation.

TECHNICAL DATA

Pipe Data – Steel

Schedule No. 40 & 80

| Pipe Size | O.D. | Schedule No. | Wall Thickness | Weight per Foot (lbs) | Weight of Water per Foot (lbs) |
|-----------|--------|--------------|----------------|-----------------------|--------------------------------|
| 3/8 | 0.675 | 40 | 0.091 | 0.568 | 0.083 |
| | | 80 | 0.126 | 0.739 | 0.061 |
| 1/2 | 0.840 | 40 | 0.109 | 0.851 | 0.132 |
| | | 80 | 0.147 | 1.088 | 0.101 |
| 3/4 | 1.050 | 40 | 0.113 | 1.131 | 0.230 |
| | | 80 | 0.154 | 1.474 | 0.188 |
| 1 | 1.315 | 40 | 0.133 | 1.679 | 0.374 |
| | | 80 | 0.179 | 2.172 | 0.311 |
| 1 1/4 | 1.660 | 40 | 0.140 | 2.273 | 0.648 |
| | | 80 | 0.191 | 2.997 | 0.555 |
| 1 1/2 | 1.900 | 40 | 0.145 | 2.718 | 0.882 |
| | | 80 | 0.200 | 3.631 | 0.765 |
| 2 | 2.375 | 40 | 0.154 | 3.653 | 1.455 |
| | | 80 | 0.218 | 5.022 | 1.280 |
| 2 1/2 | 2.875 | 40 | 0.203 | 5.793 | 2.076 |
| | | 80 | 0.276 | 7.661 | 1.837 |
| 3 | 3.500 | 40 | 0.216 | 7.580 | 3.20 |
| | | 80 | 0.300 | 10.25 | 2.864 |
| 3 1/2 | 4.000 | 40 | 0.226 | 9.11 | 4.280 |
| | | 80 | 0.318 | 12.51 | 3.850 |
| 4 | 4.500 | 40 | 0.237 | 10.79 | 5.510 |
| | | 80 | 0.337 | 14.98 | 4.980 |
| 5 | 5.563 | 40 | 0.258 | 14.62 | 8.660 |
| | | 80 | 0.375 | 20.78 | 7.870 |
| 6 | 6.625 | 40 | 0.280 | 18.97 | 12.51 |
| | | 80 | 0.432 | 28.57 | 11.29 |
| 8 | 8.625 | 40 | 0.322 | 28.55 | 21.69 |
| | | 80 | 0.500 | 43.39 | 19.800 |
| 10 | 10.75 | 40 | 0.365 | 40.48 | 34.10 |
| | | 80 | 0.593 | 64.33 | 31.10 |
| 12 | 12.75 | 40 | 0.406 | 53.53 | 48.50 |
| | | 80 | 0.687 | 88.51 | 44.00 |
| 14 | 14.000 | 40 | 0.437 | 63.37 | 58.70 |
| | | 80 | 0.750 | 106.13 | 53.20 |
| 16 | 16.000 | 40 | 0.500 | 82.77 | 76.50 |
| | | 80 | 0.843 | 136.46 | 69.70 |
| 18 | 18.000 | 40 | 0.562 | 104.75 | 97.00 |
| | | 80 | 0.937 | 170.75 | 88.50 |
| 20 | 20.000 | 40 | 0.593 | 122.91 | 120.4 |
| | | 80 | 1.031 | 208.87 | 109.4 |
| 24 | 24.000 | 40 | 0.687 | 171.17 | 174.3 |
| | | 80 | 1.218 | 296.36 | 158.3 |
| 30 | 30.000 | 20 | 0.500 | 158.00 | 286.2 |
| 36 | 36.000 | 20 | 0.500 | 190.00 | 417.1 |

Pipe Data – Steel

Schedule No. 10

| Pipe Size | O.D. | Wall Thickness | Weight per Foot (lbs) | Weight of Water per Foot (lbs) |
|-----------|--------|----------------|-----------------------|--------------------------------|
| 1 | 1.315 | 0.109 | 1.404 | 0.409 |
| 1¼ | 1.660 | 0.109 | 1.81 | 0.71 |
| 1½ | 1.900 | 0.109 | 2.09 | 0.96 |
| 2 | 2.375 | 0.109 | 2.64 | 1.58 |
| 2½ | 2.875 | 0.120 | 3.53 | 2.36 |
| 3 | 3.500 | 0.120 | 4.33 | 3.61 |
| 3½ | 4.000 | 0.120 | 4.97 | 4.81 |
| 4 | 4.500 | 0.120 | 5.61 | 6.17 |
| 5 | 5.563 | 0.134 | 7.77 | 9.53 |
| 6 | 6.625 | 0.134 | 9.29 | 13.74 |
| 8 | 8.625 | 0.148 | 13.40 | 23.59 |
| 10 | 10.75 | 0.165 | 18.70 | 36.9 |
| 12 | 12.75 | 0.180 | 24.20 | 52.20 |
| 14 | 14.000 | 0.250 | 36.71 | 62.06 |
| 16 | 16.000 | 0.250 | 42.10 | 81.8 |
| 18 | 18.000 | 0.250 | 47.40 | 104.3 |
| 20 | 20.000 | 0.250 | 52.70 | 129.5 |
| 24 | 24.000 | 0.250 | 63.40 | 188.0 |

Copper Tube Data

Type L & K

| TYPE L | | | | |
|-----------|-------------|----------------|-----------------------|--------------------------------|
| Tube Size | Tubing O.D. | Wall Thickness | Weight per Foot (lbs) | Weight of Water per Foot (lbs) |
| ¼ | 0.375 | .030 | .126 | .034 |
| ⅜ | 0.500 | .035 | .198 | .062 |
| ½ | 0.625 | .040 | .285 | .100 |
| ⅝ | 0.750 | .042 | .362 | .151 |
| ¾ | 0.875 | .045 | .455 | .209 |
| 1 | 1.125 | .050 | .655 | .357 |
| 1¼ | 1.375 | .055 | .884 | .546 |
| 1½ | 1.625 | .060 | 1.140 | .767 |
| 2 | 2.125 | .070 | 1.750 | 1.341 |
| 2½ | 2.625 | .080 | 2.480 | 2.064 |
| 3 | 3.125 | .090 | 3.330 | 2.949 |
| 3½ | 3.625 | .100 | 4.290 | 3.989 |
| 4 | 4.125 | .110 | 5.380 | 5.188 |
| 5 | 5.125 | .125 | 7.610 | 8.081 |
| 6 | 6.125 | .140 | 10.200 | 11.616 |
| 8 | 8.125 | .200 | 19.260 | 20.289 |
| 10 | 10.125 | .250 | 30.100 | 31.590 |
| 12 | 12.125 | .280 | 40.400 | 45.426 |

| TYPE K | | | | |
|-----------|-------------|----------------|-----------------------|--------------------------------|
| Tube Size | Tubing O.D. | Wall Thickness | Weight per Foot (lbs) | Weight of Water per Foot (lbs) |
| ¼ | 0.375 | .035 | .145 | .032 |
| ⅜ | 0.500 | .049 | .269 | .055 |
| ½ | 0.625 | .049 | .344 | .094 |
| ⅝ | 0.750 | .049 | .418 | .144 |
| ¾ | 0.875 | .065 | .641 | .188 |
| 1 | 1.125 | .065 | .839 | .337 |
| 1¼ | 1.375 | .065 | 1.040 | .527 |
| 1½ | 1.625 | .072 | 1.360 | .743 |
| 2 | 2.125 | .083 | 2.060 | 1.310 |
| 2½ | 2.625 | .095 | 2.920 | 2.000 |
| 3 | 3.125 | .109 | 4.000 | 2.960 |
| 3½ | 3.625 | .120 | 5.120 | 3.900 |
| 4 | 4.125 | .134 | 6.510 | 5.060 |
| 5 | 5.125 | .160 | 9.670 | 8.000 |
| 6 | 6.125 | .192 | 13.870 | 11.200 |
| 8 | 8.125 | .271 | 25.900 | 19.500 |
| 10 | 10.125 | .338 | 40.300 | 30.423 |
| 12 | 12.125 | .405 | 57.800 | 43.675 |

TECHNICAL DATA

Soil Pipe Data

| SERVICE WEIGHT CAST IRON (BELL & SPIGOT TYPE) | | | | |
|---|------------------------|----------------|-----------------------|--------------------------------|
| Nom. Pipe Size | O.D. of Cast Iron Pipe | Wall Thickness | Weight per Foot (lbs) | Weight of Water per Foot (lbs) |
| 2 | 2.25 | .17 | 4.00 | 1.50 |
| 3 | 3.25 | .17 | 6.00 | 3.40 |
| 4 | 4.25 | .18 | 8.00 | 6.20 |
| 5 | 5.25 | .18 | 10.40 | 12.30 |
| 6 | 6.25 | .18 | 13.00 | 13.90 |
| 8 | 8.38 | .23 | 20.00 | 25.70 |
| 10 | 10.50 | .28 | 29.00 | 40.60 |
| 12 | 12.50 | .28 | 38.00 | 58.20 |
| 15 | 15.62 | .31 | 51.00 | 96.60 |

| EXTRA WEIGHT CAST IRON (BELL & SPIGOT TYPE) | | | | |
|---|------------------------|----------------|-----------------------|--------------------------------|
| Nom. Pipe Size | O.D. of Cast Iron Pipe | Wall Thickness | Weight per Foot (lbs) | Weight of Water per Foot (lbs) |
| 2 | 2.38 | .190 | 5.00 | 1.60 |
| 3 | 3.50 | .250 | 9.00 | 3.70 |
| 4 | 4.50 | .250 | 12.00 | 6.50 |
| 5 | 5.50 | .250 | 15.00 | 10.20 |
| 6 | 6.50 | .250 | 19.00 | 14.70 |
| 8 | 8.62 | .310 | 30.00 | 26.10 |
| 10 | 10.75 | .375 | 43.00 | 40.80 |
| 12 | 12.75 | .375 | 54.00 | 58.80 |
| 15 | 15.88 | .440 | 75.00 | 91.80 |

| NO-HUB CAST IRON | | | | |
|------------------|------------------------|----------------|-----------------------|--------------------------------|
| Nom. Pipe Size | O.D. of Cast Iron Pipe | Wall Thickness | Weight per Foot (lbs) | Weight of Water per Foot (lbs) |
| 1½ | 1.90 | .16 | 2.70 | 3.50 |
| 2 | 2.35 | .16 | 3.60 | 5.00 |
| 3 | 3.35 | .16 | 5.20 | 8.30 |
| 4 | 4.38 | .19 | 7.40 | 12.80 |
| 5 | 5.30 | .19 | 9.60 | 17.90 |
| 6 | 6.30 | .19 | 11.00 | 23.00 |
| 8 | 8.38 | .23 | 18.00 | 39.50 |
| 10 | 10.50 | .28 | 26.20 | 43.34 |
| 12 | 12.50 | .28 | 35.50 | 62.51 |

AWWA Ductile Iron Pipe Data

| Nom. Pipe Size | Class | O.D. D.I. Pipe | Wall Thickness | Weight per Foot (lbs) | Weight of Water per Foot (lbs) |
|----------------|-------|----------------|----------------|-----------------------|--------------------------------|
| 3 | 53 | 3.96 | .31 | 11.20 | 3.80 |
| 4 | 53 | 4.80 | .32 | 14.20 | 5.90 |
| 6 | 53 | 6.90 | .34 | 22.00 | 13.10 |
| 8 | 53 | 9.05 | .36 | 31.00 | 23.00 |
| 10 | 53 | 11.10 | .38 | 40.40 | 36.40 |
| 12 | 53 | 13.20 | .40 | 50.70 | 52.30 |
| 14 | 53 | 15.30 | .42 | 62.40 | 71.10 |
| 16 | 53 | 17.40 | .43 | 72.80 | 93.10 |
| 18 | 53 | 19.50 | .44 | 83.60 | 117.90 |
| 20 | 53 | 21.60 | .45 | 95.20 | 145.80 |
| 24 | 53 | 25.80 | .47 | 119.20 | 210.20 |
| 30 | 53 | 32.00 | .51 | 161.30 | 326.50 |
| 36 | 53 | 38.30 | .58 | 219.50 | 469.30 |
| 42 | 53 | 44.50 | .65 | 285.20 | 634.90 |
| 48 | 53 | 50.80 | .72 | 360.30 | 828.90 |

PVC Plastic Pipe Data

Schedule No. 40 & 80

| Pipe Size | O.D. | Schedule No. | Wall Thickness | Weight per Foot (lbs) | Weight of Water per Foot (lbs) |
|-----------|--------|--------------|----------------|-----------------------|--------------------------------|
| 1/8 | 0.405 | 40 | 0.068 | 0.043 | 0.025 |
| | | 80 | 0.095 | 0.055 | 0.016 |
| 1/4 | 0.540 | 40 | 0.088 | 0.074 | 0.045 |
| | | 80 | 0.119 | 0.094 | 0.031 |
| 3/8 | 0.675 | 40 | 0.091 | 0.100 | 0.083 |
| | | 80 | 0.126 | 0.129 | 0.061 |
| 1/2 | 0.840 | 40 | 0.109 | 0.150 | 0.132 |
| | | 80 | 0.147 | 0.150 | 0.101 |
| 3/4 | 1.050 | 40 | 0.113 | 0.199 | 0.230 |
| | | 80 | 0.154 | 0.259 | 0.186 |
| 1 | 1.315 | 40 | 0.133 | 0.295 | 0.374 |
| | | 80 | 0.179 | 0.382 | 0.311 |
| 1 1/4 | 1.660 | 40 | 0.140 | 0.400 | 0.647 |
| | | 80 | 0.191 | 0.527 | 0.555 |
| 1 1/2 | 1.900 | 40 | 0.145 | 0.478 | 0.882 |
| | | 80 | 0.200 | 0.639 | 0.765 |
| 2 | 2.375 | 40 | 0.154 | 0.643 | 1.452 |
| | | 80 | 0.218 | 0.884 | 1.279 |
| 2 1/2 | 2.875 | 40 | 0.203 | 1.020 | 2.072 |
| | | 80 | 0.276 | 1.350 | 1.834 |
| 3 | 3.500 | 40 | 0.216 | 1.333 | 3.200 |
| | | 80 | 0.300 | 1.804 | 2.860 |
| 3 1/2 | 4.000 | 40 | 0.226 | 1.598 | 4.280 |
| | | 80 | 0.318 | 2.195 | 3.850 |
| 4 | 4.500 | 40 | 0.237 | 1.899 | 5.510 |
| | | 80 | 0.337 | 2.636 | 4.980 |
| 5 | 5.563 | 40 | 0.258 | 2.770 | 8.660 |
| | | 80 | 0.375 | 4.126 | 7.870 |
| 6 | 6.625 | 40 | 0.280 | 3.339 | 12.150 |
| | | 80 | 0.432 | 5.028 | 11.290 |
| 8 | 8.625 | 40 | 0.322 | 5.280 | 21.600 |
| | | 80 | 0.500 | 8.023 | 19.800 |
| 10 | 10.750 | 40 | 0.366 | 7.505 | 34.100 |
| | | 80 | 0.593 | 11.894 | 31.100 |
| 12 | 12.750 | 40 | 0.406 | 10.023 | 48.500 |
| | | 80 | 0.687 | 16.365 | 44.000 |

TECHNICAL DATA

Thermal Expansion of Pipe Material

| THERMAL EXPANSION OF PIPE MATERIAL – (IN/FT) | | | | | | | | | | |
|--|--|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Temp °F | Carbon Steel - Low Chrome Steel (thru 3% Cr) | | | | | | | | | |
| | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 |
| -200 | -0.0180 | -0.0187 | -0.0192 | -0.0198 | -0.0203 | -0.0209 | -0.0215 | -0.0220 | -0.0225 | -0.0230 |
| -100 | -0.0121 | -0.0127 | -0.0133 | -0.0140 | -0.0146 | -0.0152 | -0.0158 | -0.0163 | -0.0169 | -0.0174 |
| 0 | -0.0051 | -0.0058 | -0.0065 | -0.0073 | -0.0080 | -0.0087 | -0.0096 | -0.0103 | -0.0109 | -0.0116 |
| 0 | -0.0051 | -0.0044 | -0.0037 | -0.0029 | -0.0022 | -0.0015 | -0.0007 | 0 | 0.0008 | 0.0015 |
| 100 | 0.0023 | 0.0030 | 0.0038 | 0.0046 | 0.0053 | 0.0061 | 0.0068 | 0.0076 | 0.0084 | 0.0091 |
| 200 | 0.0099 | 0.0107 | 0.0116 | 0.0124 | 0.0132 | 0.0141 | 0.0149 | 0.0157 | 0.0165 | 0.0174 |
| 300 | 0.0182 | 0.0191 | 0.0200 | 0.0208 | 0.0217 | 0.0226 | 0.0235 | 0.0244 | 0.0252 | 0.0261 |
| 400 | 0.0270 | 0.0279 | 0.0288 | 0.0298 | 0.0307 | 0.0316 | 0.0325 | 0.0334 | 0.0344 | 0.0353 |
| 500 | 0.0362 | 0.0372 | 0.0382 | 0.0391 | 0.0401 | 0.0411 | 0.0421 | 0.0431 | 0.0440 | 0.0450 |
| 600 | 0.0460 | 0.0470 | 0.0481 | 0.0491 | 0.0501 | 0.0512 | 0.0522 | 0.0532 | 0.0542 | 0.0553 |
| 700 | 0.0563 | 0.0574 | 0.0584 | 0.0595 | 0.0606 | 0.0617 | 0.0627 | 0.0638 | 0.0649 | 0.0659 |
| 800 | 0.0670 | 0.0681 | 0.0692 | 0.0703 | 0.0714 | 0.0726 | 0.0737 | 0.0748 | 0.0759 | 0.0770 |
| 900 | 0.0781 | 0.0792 | 0.0803 | 0.0813 | 0.0824 | 0.0835 | 0.0846 | 0.0857 | 0.0867 | 0.0878 |
| 1,000 | 0.0889 | 0.0901 | 0.0912 | 0.0924 | 0.0935 | 0.0946 | 0.0958 | 0.0970 | 0.0981 | 0.0993 |
| 1,100 | 0.1004 | 0.1015 | 0.1025 | 0.1036 | 0.1046 | 0.1057 | 0.1068 | 0.1078 | 0.1089 | 0.1099 |
| 1,200 | 0.1110 | 0.1121 | 0.1132 | 0.1144 | 0.1155 | 0.1166 | 0.1177 | 0.1188 | 0.1200 | 0.1211 |
| 1,300 | 0.1222 | 0.1233 | 0.1244 | 0.1256 | 0.1267 | 0.1278 | 0.1299 | 0.1320 | 0.1342 | 0.1363 |
| 1,400 | 0.1334 | - | - | - | - | - | - | - | - | - |

| THERMAL EXPANSION OF PIPE MATERIAL – (IN/FT) | | | | | | | | | | |
|--|---|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Temp °F | Austenitic Stainless Steels (304, 316, 347) | | | | | | | | | |
| | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 |
| -200 | -0.0281 | -0.0295 | -0.0305 | -0.0314 | -0.0324 | -0.0334 | -0.0343 | -0.0353 | -0.0362 | -0.0372 |
| -100 | -0.0187 | -0.0197 | -0.0207 | -0.0216 | -0.0226 | -0.0236 | -0.0245 | -0.0254 | -0.0263 | -0.0272 |
| 0 | -0.0078 | -0.0089 | -0.0100 | -0.0112 | -0.0123 | -0.0134 | -0.0145 | -0.0155 | -0.0166 | -0.0176 |
| 0 | -0.0078 | -0.0067 | -0.0056 | -0.0044 | -0.0033 | -0.0022 | -0.0011 | 0 | 0.0012 | 0.0023 |
| 100 | 0.0034 | 0.0045 | 0.0056 | 0.0068 | 0.0079 | 0.0090 | 0.0101 | 0.0112 | 0.0124 | 0.0135 |
| 200 | 0.0146 | 0.0158 | 0.0169 | 0.0181 | 0.0192 | 0.0203 | 0.0215 | 0.0227 | 0.0238 | 0.0250 |
| 300 | 0.0261 | 0.0273 | 0.0285 | 0.0297 | 0.0309 | 0.0321 | 0.0332 | 0.0344 | 0.0356 | 0.0368 |
| 400 | 0.0380 | 0.0392 | 0.0404 | 0.0416 | 0.0428 | 0.0440 | 0.0453 | 0.0465 | 0.0477 | 0.0489 |
| 500 | 0.0501 | 0.0513 | 0.0526 | 0.0538 | 0.0550 | 0.0562 | 0.0575 | 0.0587 | 0.0599 | 0.0612 |
| 600 | 0.0624 | 0.0637 | 0.0649 | 0.0662 | 0.0674 | 0.0687 | 0.0700 | 0.0712 | 0.0725 | 0.0737 |
| 700 | 0.0750 | 0.0763 | 0.0776 | 0.0789 | 0.0802 | 0.0815 | 0.0828 | 0.0841 | 0.0854 | 0.0867 |
| 800 | 0.0880 | 0.0893 | 0.0906 | 0.0920 | 0.0933 | 0.0946 | 0.0959 | 0.0972 | 0.0986 | 0.0999 |
| 900 | 0.1012 | 0.1260 | 0.1039 | 0.1053 | 0.1066 | 0.1080 | 0.1094 | 0.1107 | 0.1121 | 0.1134 |
| 1,000 | 0.1148 | 0.1162 | 0.1175 | 0.1189 | 0.1202 | 0.1216 | 0.1229 | 0.1243 | 0.1257 | 0.1270 |
| 1,100 | 0.1284 | 0.1298 | 0.1311 | 0.1325 | 0.1338 | 0.1352 | 0.1366 | 0.1379 | 0.1393 | 0.1406 |
| 1,200 | 0.1420 | 0.1434 | 0.1447 | 0.1461 | 0.1474 | 0.1488 | 0.1502 | 0.1515 | 0.1529 | 0.1542 |
| 1,300 | 0.1556 | 0.1570 | 0.1583 | 0.1597 | 0.1610 | 0.1624 | 0.1638 | 0.1651 | 0.1665 | 0.1678 |
| 1,400 | 0.1692 | 0.1704 | 0.1717 | 0.1731 | 0.1744 | 0.1757 | 0.1771 | 0.1784 | 0.1796 | 0.1811 |

Note: Intersect "10" Degree increments across the top of each table with the "100" degree increments down the left side to determine the coefficient of thermal expansion for the desired temperature.

Thermal Expansion of Pipe Material

| THERMAL EXPANSION OF PIPE MATERIAL – (IN/FT) | | | | |
|--|---|---------|---------|----------|
| Temp °F | Intermediate Alloy Steels (5% thru 9% Cr Mo) | Copper | Brass | Aluminum |
| -200 | – | -0.0275 | -0.2870 | -0.0373 |
| -150 | – | -0.0231 | -0.0241 | -0.0310 |
| -100 | – | -0.1830 | -0.1900 | -0.0244 |
| -50 | – | -0.1320 | -0.0137 | -0.0176 |
| 0 | – | -0.0790 | -0.0081 | -0.0104 |
| 50 | – | -0.0022 | -0.0023 | -0.0030 |
| 70 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| 100 | 0.0022 | 0.0034 | 0.0035 | 0.0046 |
| 150 | 0.0058 | 0.0091 | 0.0093 | 0.0123 |
| 200 | 0.0094 | 0.0151 | 0.0152 | 0.0200 |
| 250 | 0.0132 | 0.0208 | 0.0214 | 0.0283 |
| 300 | 0.0171 | 0.0267 | 0.0276 | 0.0366 |
| 350 | 0.0210 | 0.0327 | 0.0340 | 0.0452 |
| 400 | 0.0250 | 0.0388 | 0.0405 | 0.0539 |
| 450 | 0.0292 | 0.0449 | 0.0472 | 0.0628 |
| 500 | 0.0335 | 0.0512 | 0.0540 | 0.0717 |
| 550 | 0.0379 | 0.0574 | 0.0610 | 0.0810 |
| 600 | 0.0424 | 0.0639 | 0.0680 | 0.0903 |
| 650 | 0.0469 | 0.0703 | 0.0753 | – |
| 700 | 0.0514 | 0.0768 | 0.0826 | – |
| 750 | 0.0562 | 0.0834 | 0.0902 | – |
| 800 | 0.0610 | 0.0900 | 0.0978 | – |
| 850 | 0.0658 | 0.0967 | 0.1056 | – |
| 900 | 0.0707 | 0.1037 | 0.1135 | – |
| 950 | 0.0756 | 0.1105 | 0.1216 | – |
| 1,000 | 0.0806 | 0.1175 | 0.1298 | – |
| 1,050 | 0.0855 | – | – | – |
| 1,100 | 0.0905 | – | – | – |
| 1,150 | 0.0952 | – | – | – |
| 1,200 | 0.1000 | – | – | – |
| 1,250 | 0.1053 | – | – | – |
| 1,300 | 0.1106 | – | – | – |
| 1,350 | 0.1155 | – | – | – |
| 1,400 | 0.1205 | – | – | – |

TECHNICAL DATA

Threaded Rod Data

LOAD CARRYING CAPACITIES OF THREADED HANGER RODS. MATERIALS CARBON STEEL WITH MINIMUM ACTUAL TENSILE STRENGTH OF 50 KSI.

| Rod Diameter (in) | Threads per Inch | Root Area of Coarse Thread (in ²) | Maximum Safe Load (lbs) Rod Temperature, 650° F | Maximum Safe Load (lbs) Rod Temperature, 750° F |
|-------------------|------------------|---|---|---|
| 3/8 | 16 UNC | 0.0678 | 730 | 572 |
| 1/2 | 13 UNC | 0.126 | 1,350 | 1,057 |
| 5/8 | 11 UNC | 0.202 | 2,160 | 1,692 |
| 3/4 | 10 UNC | 0.302 | 3,230 | 2,530 |
| 7/8 | 9 UNC | 0.419 | 4,480 | 3,508 |
| 1 | 8 UNC | 0.551 | 5,900 | 4,620 |
| 1 1/4 | 7 UNC | 0.890 | 9,500 | 7,440 |
| 1 1/2 | 6 UNC | 1.29 | 13,800 | 10,807 |
| 1 3/4 | 5 UNC | 1.74 | 18,600 | 14,566 |
| 2 | 4 1/2 UNC | 2.30 | 24,600 | 19,265 |
| 2 1/4 | 4 1/2 UNC | 3.02 | 32,300 | 25,295 |
| 2 1/2 | 4 UNC | 3.72 | 39,800 | 31,169 |
| 2 3/4 | 4 UNC | 4.62 | 49,400 | 38,687 |
| 3 | 4 UNC | 5.62 | 60,100 | 47,066 |
| 3 1/4 | 4 UNC | 6.72 | 71,900 | 56,307 |
| 3 1/2 | 4 UNC | 7.92 | 84,700 | 66,331 |
| 3 3/4 | 4 UNC | 9.21 | 98,500 | 77,139 |
| 4 | 4 UNC | 10.6 | 114,000 | 88,807 |
| 4 1/4 | 4 UN | 12.1 | 129,000 | 101,337 |
| 4 1/2 | 4 UN | 13.7 | 146,000 | 114,807 |
| 4 3/4 | 4 UN | 15.4 | 165,000 | 128,982 |
| 5 | 4 UN | 17.2 | 184,000 | 144,096 |

Standard UNC thread thru 4" diameter and 4-UN-2A thread series for 4 1/4" diameter and larger. Threads conform to ANSI/ASME B1.1.

Maximum Recommended Applied Torques

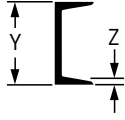
| FOR FIG. 261 & CT-121 RISER CLAMPS | |
|------------------------------------|-------------------------|
| Bolt Size | Torque Value (ft.- lbs) |
| 1/4 | 6 |
| 5/16 | 11 |
| 3/8 | 21 |
| 7/16 | 32 |
| 1/2 | 46 |
| 5/8 | 100 |
| 3/4 | 150 |
| 7/8 | 190 |
| 1 | 280 |

Bolts per ASTM A307
Nuts per ASTM A563

| FOR SET SCREWS IN MSS TYPE 19 & 23 C-CLAMP | |
|---|-------------------------|
| Thread Size | Torque Value (in.- lbs) |
| 1/4 | 40 |
| 3/8 | 60 |
| 1/2 | 125 |
| 5/8 | 250 |
| 3/4 | 400 |
| 7/8 | 665 |

Extracted from MSS-SP-69

Beam Dimensions



| AMERICAN STANDARD CHANNELS | | | |
|----------------------------|---------------------|-------------------------------|------------------------|
| Depth of Section Y | Weight per Ft., lb. | Flange Width | Mean Thick of Flange Z |
| 3 | 4.1 | 1 ³ / ₈ | 0.250 |
| | 5.0 | 1 ¹ / ₂ | |
| | 6.0 | 1 ⁵ / ₈ | |
| 4 | 5.4 | 1 ³ / ₈ | 0.313 |
| | 7.25 | 1 ³ / ₄ | |
| 5 | 6.7 | 1 ³ / ₄ | 0.313 |
| | 9.0 | 1 ⁷ / ₈ | |
| 6 | 8.2 | 1 ⁷ / ₈ | 0.375 |
| | 10.5 | 2 | |
| 7 | 9.8 | 2 ¹ / ₈ | 0.375 |
| | 12.25 | 2 ¹ / ₄ | |
| 8 | 14.75 | 2 ¹ / ₄ | 0.375 |
| | 11.5 | 2 ¹ / ₄ | |
| | 13.75 | 2 ³ / ₈ | |
| 9 | 18.75 | 2 ¹ / ₂ | 0.438 |
| | 13.4 | 2 ³ / ₈ | |
| 10 | 15.0 | 2 ¹ / ₂ | 0.438 |
| | 20.0 | 2 ⁵ / ₈ | |
| | 15.3 | 2 ⁵ / ₈ | |
| 12 | 20.0 | 2 ³ / ₄ | 0.500 |
| | 25.0 | 2 ⁷ / ₈ | |
| 15 | 30.0 | 3 | 0.625 |
| | 20.7 | 3 | |
| | 25.0 | 3 | |
| 18 | 30.0 | 3 | 0.625 |
| | 33.9 | 3 ¹ / ₈ | |
| | 40.0 | 3 ¹ / ₂ | |
| | 50.0 | 3 ³ / ₄ | |

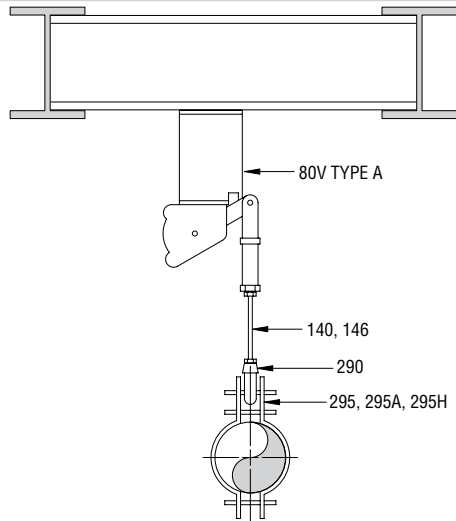
| S SHAPES | | | |
|--------------------|---------------------|-------------------------------|------------------------|
| Depth of Section Y | Weight per Ft., lb. | Flange Width | Mean Thick of Flange Z |
| 3 | 5.7 | 2 ³ / ₈ | 0.250 |
| | 7.5 | 2 ¹ / ₂ | |
| 4 | 7.7 | 2 ⁵ / ₈ | 0.313 |
| | 9.5 | 2 ³ / ₄ | |
| 5 | 10.0 | 3 | 0.313 |
| | 14.75 | 3 ¹ / ₄ | |
| 6 | 12.5 | 3 ³ / ₈ | 0.375 |
| | 17.25 | 3 ⁵ / ₈ | |
| 7 | 15.3 | 3 ³ / ₈ | 0.375 |
| | 20.0 | 3 ⁷ / ₈ | |
| 8 | 18.4 | 4 | 0.438 |
| | 23.0 | 4 ¹ / ₈ | |
| 10 | 25.4 | 4 ⁵ / ₈ | 0.500 |
| | 35.0 | 5 | |
| 12 | 31.8 | 5 | 0.563 |
| | 35.0 | 5 ¹ / ₈ | |
| | 40.8 | 5 ¹ / ₄ | |
| 15 | 50.0 | 5 ¹ / ₂ | 0.688 |
| | 42.9 | 5 ¹ / ₂ | |
| 18 | 50.0 | 5 ⁵ / ₈ | 0.625 |
| | 54.7 | 6 | |
| 20 | 70.0 | 6 ¹ / ₄ | 0.813 |
| | 66.0 | 6 ¹ / ₄ | |
| 20.3 | 75.0 | 6 ³ / ₈ | 0.938 |
| | 86.0 | 7 | |
| 24 | 96.0 | 7 ¹ / ₄ | 0.875 |
| | 80.0 | 7 | |
| | 100.0 | 7 ¹ / ₄ | |

| W SHAPES | | | |
|--------------------|--------------------------------|--------------------------------|------------------------|
| Depth of Section Y | Weight per Ft., lb. | Flange Width | Mean Thick of Flange Z |
| 5 | 19 | 5 | 0.430 |
| 6 | 25 | 6 ¹ / ₈ | 0.455 |
| | 18 | 5 ¹ / ₄ | 0.330 |
| 8 | 21 | 5 ¹ / ₄ | 0.400 |
| | 24 | 6 ¹ / ₂ | 0.400 |
| | 28 | 6 ¹ / ₂ | 0.465 |
| | 31 | 8 | 0.435 |
| | 35 | 8 | 0.495 |
| | 40 | 8 ¹ / ₈ | 0.560 |
| | 48 | 8 ¹ / ₈ | 0.685 |
| | 58 | 8 ¹ / ₄ | 0.810 |
| 10 | 67 | 8 ¹ / ₄ | 0.935 |
| | 22 | 5 ³ / ₄ | 0.360 |
| | 26 | 5 ³ / ₄ | 0.440 |
| | 30 | 5 ³ / ₄ | 0.510 |
| | 33 | 8 | 0.435 |
| | 39 | 8 | 0.530 |
| | 45 | 8 | 0.620 |
| | 49 | 10 | 0.560 |
| | 54 | 10 | 0.615 |
| | 60 | 10 ¹ / ₈ | 0.680 |
| 12 | 68 | 10 ¹ / ₈ | 0.770 |
| | 77 | 10 ¹ / ₄ | 0.870 |
| | 88 | 10 ¹ / ₄ | 0.990 |
| | 26 | 6 ¹ / ₂ | 0.380 |
| | 30 | 6 ¹ / ₂ | 0.440 |
| | 35 | 6 ¹ / ₂ | 0.520 |
| | 40 | 8 | 0.515 |
| | 45 | 8 | 0.575 |
| | 50 | 8 ¹ / ₈ | 0.640 |
| | 53 | 10 | 0.575 |
| 14 | 58 | 10 | 0.640 |
| | 65 | 12 | 0.605 |
| | 72 | 12 | 0.670 |
| | 79 | 12 ¹ / ₈ | 0.735 |
| | 87 | 12 ¹ / ₈ | 0.810 |
| | 96 | 12 ¹ / ₈ | 0.900 |
| | 106 | 12 ¹ / ₄ | 0.990 |
| | 30 | 6 ³ / ₄ | 0.385 |
| | 34 | 6 ³ / ₄ | 0.455 |
| | 38 | 6 ³ / ₄ | 0.515 |
| 43 | 8 | 0.530 | |
| 48 | 8 | 0.595 | |
| 53 | 8 | 0.660 | |
| 61 | 10 | 0.645 | |
| 68 | 10 | 0.720 | |
| 74 | 10 ¹ / ₈ | 0.785 | |
| 82 | 10 ¹ / ₈ | 0.855 | |
| 90 | 14 ¹ / ₂ | 0.710 | |

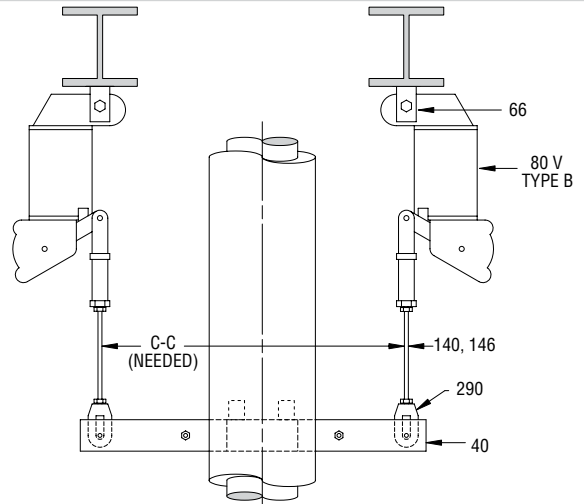
| W SHAPES | | | |
|--------------------|---------------------|--------------------------------|------------------------|
| Depth of Section Y | Weight per Ft., lb. | Flange Width | Mean Thick of Flange Z |
| 14 | 99 | 14 ⁵ / ₈ | 0.780 |
| | 109 | 14 ⁵ / ₈ | 0.860 |
| | 120 | 14 ⁵ / ₈ | 0.940 |
| 16 | 132 | 14 ³ / ₄ | 1.030 |
| | 36 | 7 | 0.430 |
| | 40 | 7 | 0.505 |
| | 45 | 7 | 0.565 |
| | 50 | 7 ¹ / ₈ | 0.63 |
| | 57 | 7 ¹ / ₈ | 0.715 |
| | 67 | 10 ¹ / ₄ | 0.665 |
| | 77 | 10 ¹ / ₄ | 0.760 |
| 18 | 89 | 10 ³ / ₈ | 0.875 |
| | 100 | 10 ³ / ₈ | 0.985 |
| | 50 | 7 ¹ / ₂ | 0.570 |
| | 55 | 7 ¹ / ₂ | 0.630 |
| | 60 | 7 ¹ / ₂ | 0.695 |
| | 65 | 7 ⁵ / ₈ | 0.750 |
| | 71 | 7 ⁵ / ₈ | 0.810 |
| | 76 | 11 | 0.680 |
| | 86 | 11 ¹ / ₈ | 0.770 |
| | 97 | 11 ¹ / ₈ | 0.870 |
| 21 | 106 | 11 ¹ / ₄ | 0.940 |
| | 62 | 8 ¹ / ₄ | 0.615 |
| | 68 | 8 ¹ / ₄ | 0.685 |
| | 73 | 8 ¹ / ₄ | 0.740 |
| | 83 | 8 ³ / ₈ | 0.835 |
| | 93 | 8 ³ / ₈ | 0.930 |
| | 101 | 12 ¹ / ₄ | 0.800 |
| | 111 | 12 ³ / ₈ | 0.875 |
| 24 | 122 | 12 ³ / ₈ | 0.960 |
| | 76 | 9 | 0.680 |
| | 84 | 9 | 0.770 |
| | 94 | 9 ¹ / ₈ | 0.875 |
| | 104 | 12 ³ / ₄ | 0.750 |
| | 117 | 12 ³ / ₄ | 0.850 |
| 27 | 131 | 12 ⁷ / ₈ | 0.960 |
| | 94 | 10 | 0.745 |
| | 102 | 10 | 0.830 |
| | 114 | 10 ¹ / ₈ | 0.930 |
| 30 | 146 | 14 | 0.975 |
| | 108 | 10 ¹ / ₂ | 0.760 |
| | 116 | 10 ¹ / ₂ | 0.850 |
| | 124 | 10 ¹ / ₂ | 0.930 |
| | 132 | 10 ¹ / ₂ | 1.000 |
| 33 | 118 | 11 ¹ / ₂ | 0.740 |
| | 130 | 11 ¹ / ₂ | 0.855 |
| | 141 | 11 ¹ / ₂ | 0.960 |
| 36 | 135 | 12 | 0.790 |
| | 150 | 12 | 0.940 |
| | 160 | 12 | 1.020 |

APPLICATION ASSEMBLY EXAMPLES

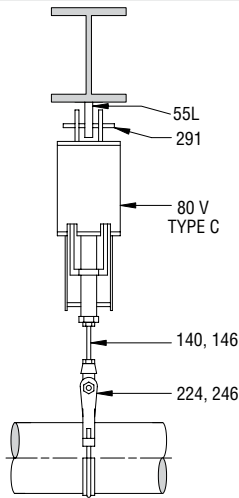
Constant Hanger Assemblies



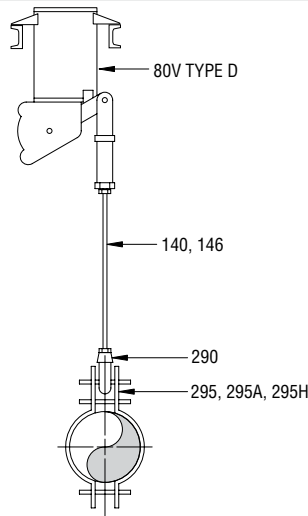
Fig_80V_Type_A .DWG, .DXF, or .EPS



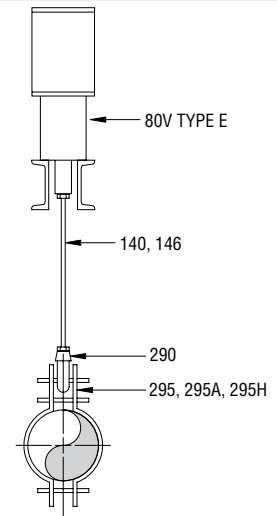
Fig_80V_Type_B .DWG, .DXF, or .EPS



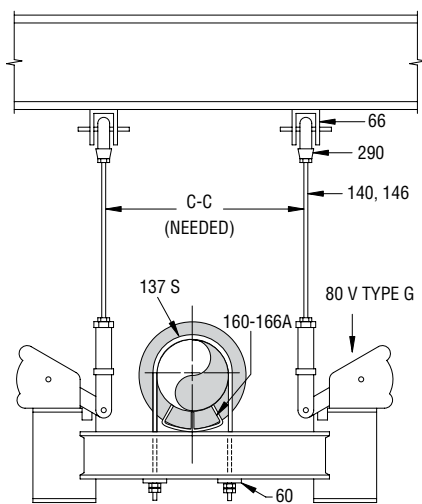
Fig_80V_Type_C .DWG, .DXF, or .EPS



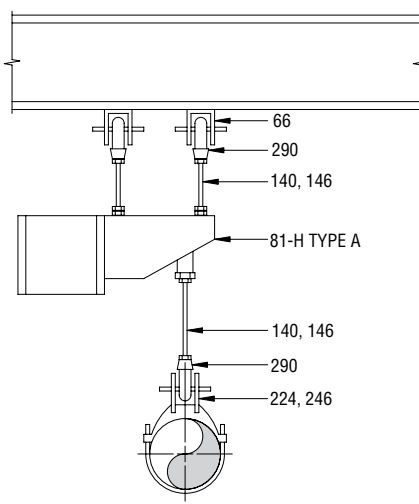
Fig_80V_Type_D .DWG, .DXF, or .EPS



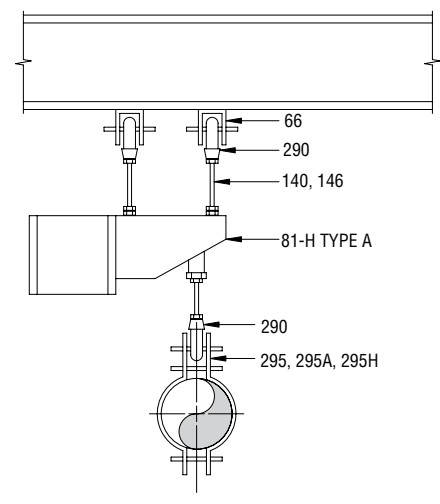
Fig_80V_Type_E .DWG, .DXF, or .EPS



Fig_80V_Type_G .DWG, .DXF, or .EPS



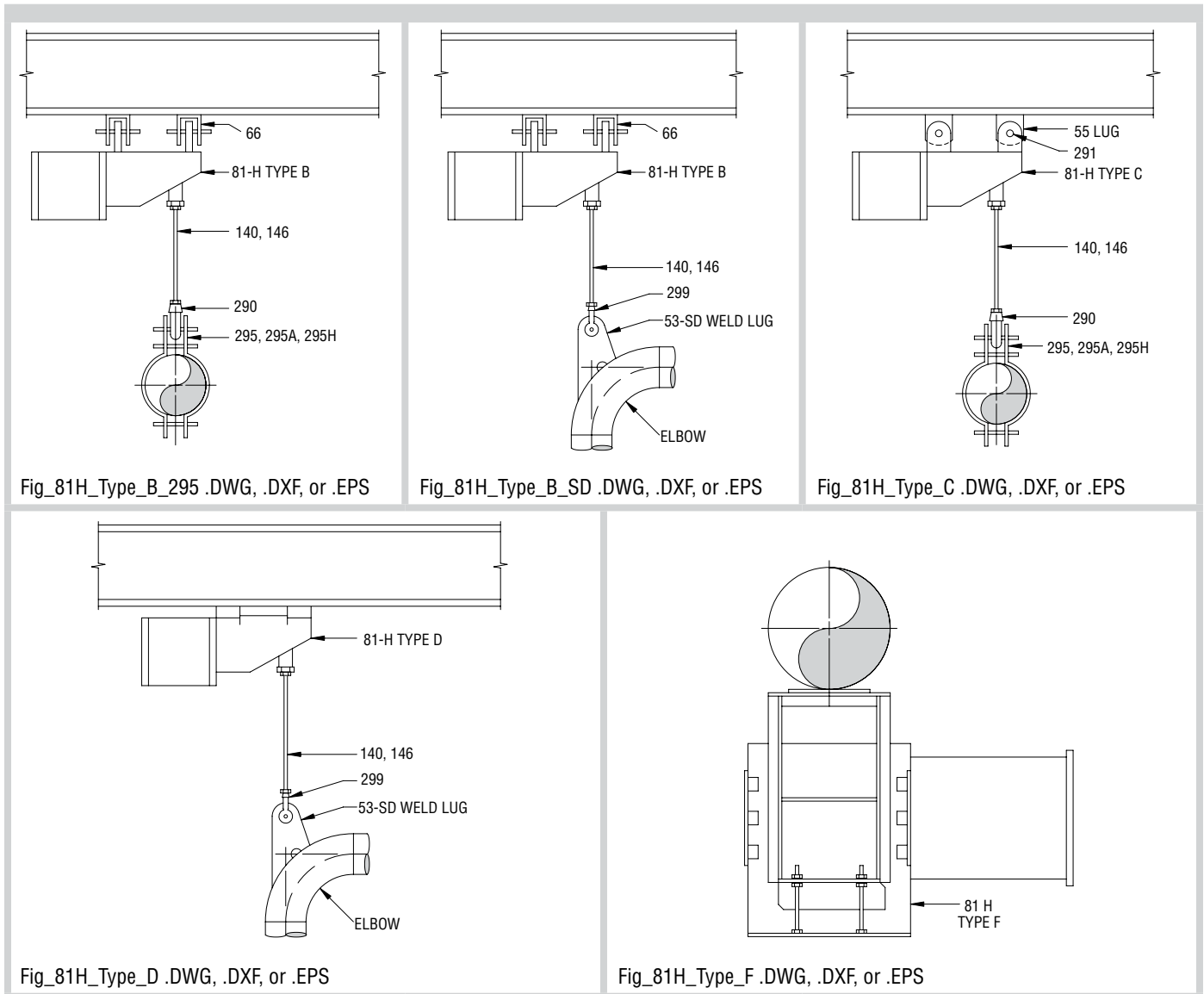
Fig_81H_Type_A_224 .DWG, .DXF, or .EPS



Fig_81H_Type_A_295 .DWG, .DXF, or .EPS

Each of these drawings are available on the Anvil web site in CAD format. The file name at the bottom of each box refers to that CAD file.

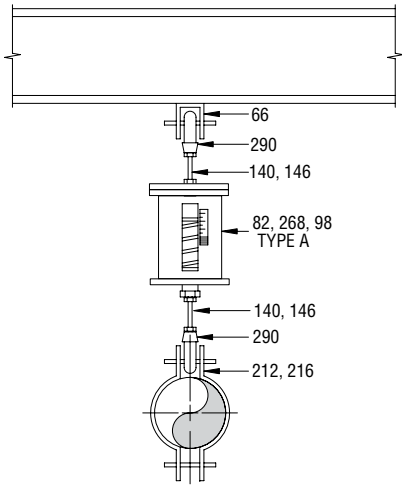
Constant Hanger Assemblies (continued)



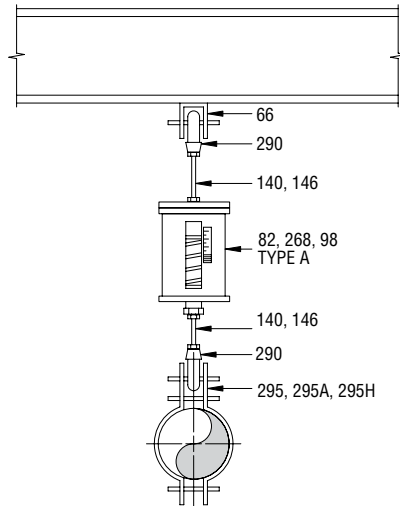
Each of these drawings are available on the Anvil web site in CAD format. The file name at the bottom of each box refers to that CAD file.

APPLICATION ASSEMBLY EXAMPLES

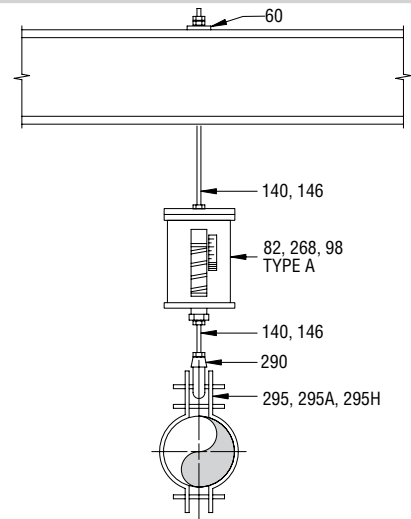
Spring Hanger Assemblies



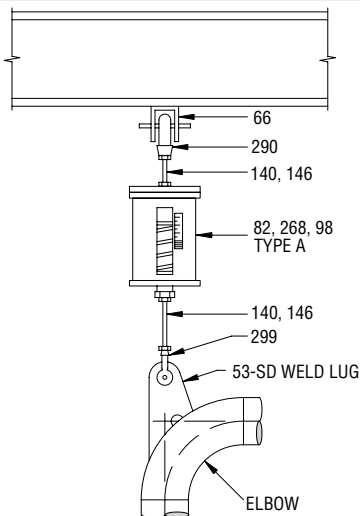
SH_Type_A_212 .DWG, .DXF, or .EPS



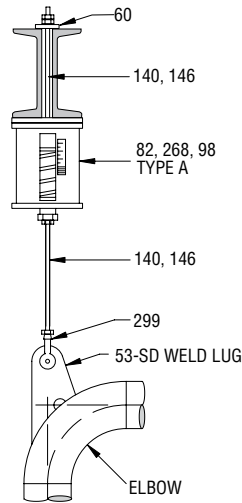
SH_Type_A_295 .DWG, .DXF, or .EPS



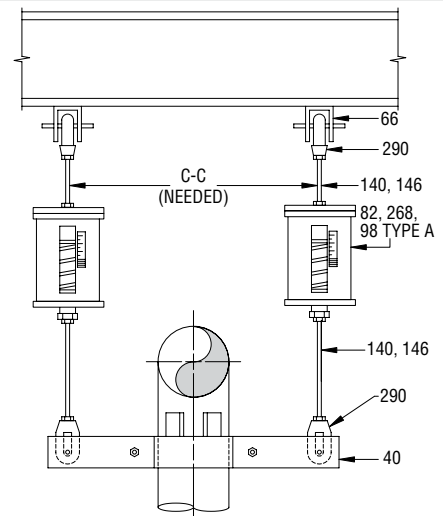
SH_Type_A_60 .DWG, .DXF, or .EPS



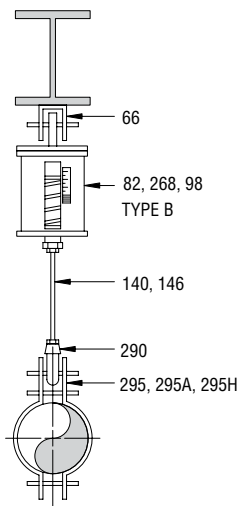
SH_Type_A_53SD .DWG, .DXF, or .EPS



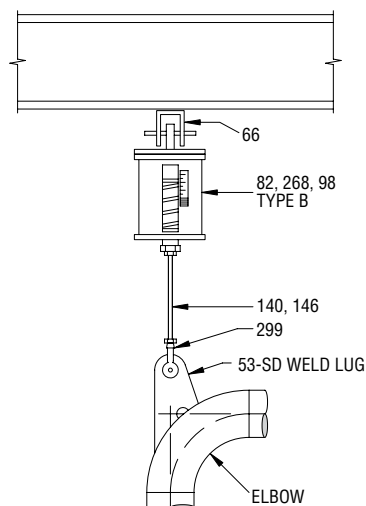
SH_Type_A_53SD_60 .DWG, .DXF, or .EPS



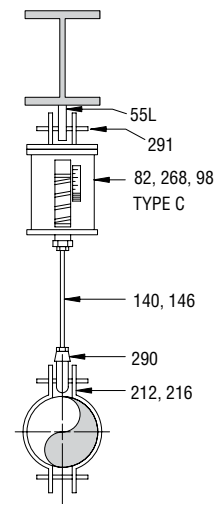
SH_Type_A_Riser .DWG, .DXF, or .EPS



SH_Type_B_295 .DWG, .DXF, or .EPS



SH_Type_B_53SD .DWG, .DXF, or .EPS



SH_Type_C_212 .DWG, .DXF, or .EPS

Each of these drawings are available on the Anvil web site in CAD format. The file name at the bottom of each box refers to that CAD file.

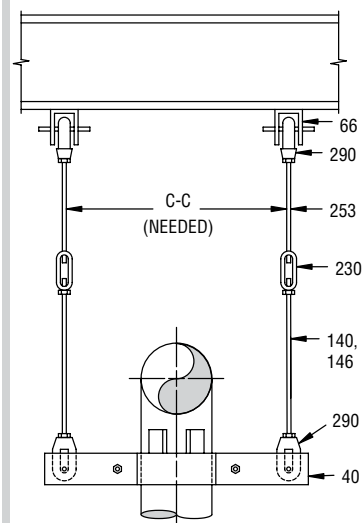
Spring Hanger Assemblies (continued)

| | | | |
|--|---|--|---|
| <p>55L 82, 268, 98 TYPE C 140, 146 290 295, 295A, 295H</p> | <p>55L 291 82, 268, 98 TYPE C 140, 146 299 53-SD WELD LUG ELBOW</p> | <p>82, 268, 98 TYPE D 140, 146 290 295, 295A, 295H</p> | <p>82, 268, 98 TYPE D 140, 146 299 53-SD WELD LUG ELBOW</p> |
| <p>82, 268, 98 TYPE E 140, 146 290 295, 295A, 295H</p> | <p>PIPE SLIDE 82, 268, 98 TYPE F</p> | <p>DUAL ROLLERS 82, 268, 98 TYPE F WITH PIPE ROLL</p> | <p>PIPE STANCHION 63 82, 268, 98 TYPE F</p> |
| <p>ELBOW PIPE STANCHION 62 82, 268, 98 TYPE F</p> | <p>66 290 C-C (NEEDED) 140, 146 82, 268, 98 TYPE G</p> | <p>66 290 C-C (NEEDED) 140, 146 137 S 160-166A 82, 268, 98 TYPE G 60</p> | |

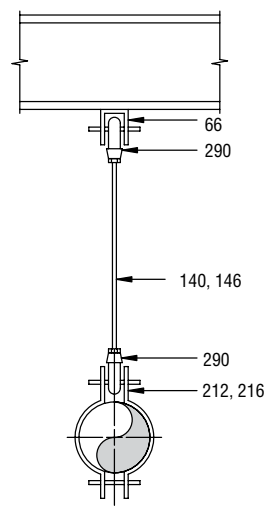
Each of these drawings are available on the Anvil web site in CAD format. The file name at the bottom of each box refers to that CAD file.

APPLICATION ASSEMBLY EXAMPLES

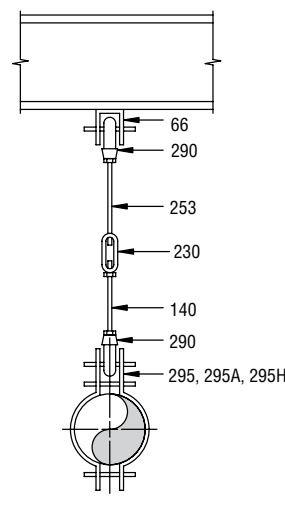
Rigid Hanger Assemblies



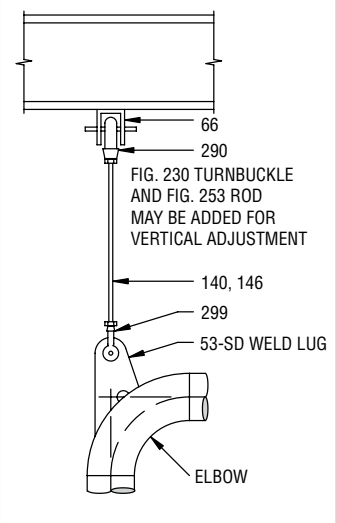
RH_40_290_230_Riser .DWG, .DXF, or .EPS



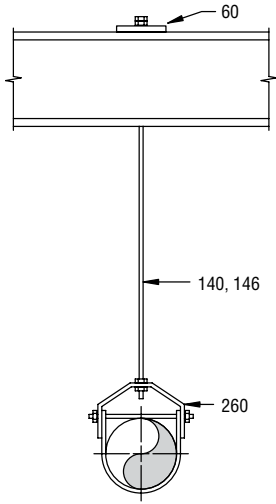
RH_212_290_140_66 .DWG, .DXF, or .EPS



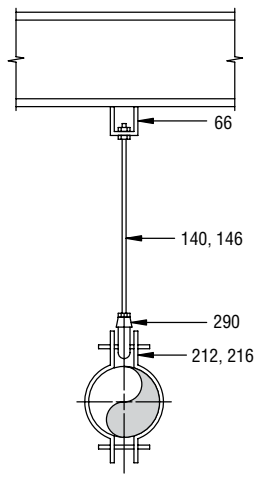
RH_295_290_230 .DWG, .DXF, or .EPS



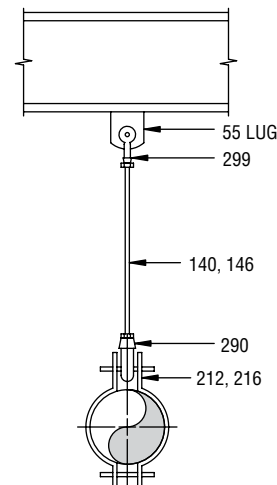
RH_53SD_299_290 .DWG, .DXF, or .EPS



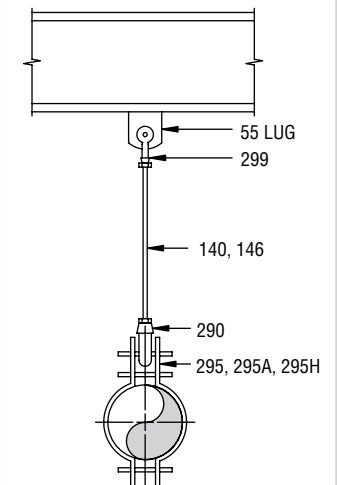
RH_260_140_60 .DWG, .DXF, or .EPS



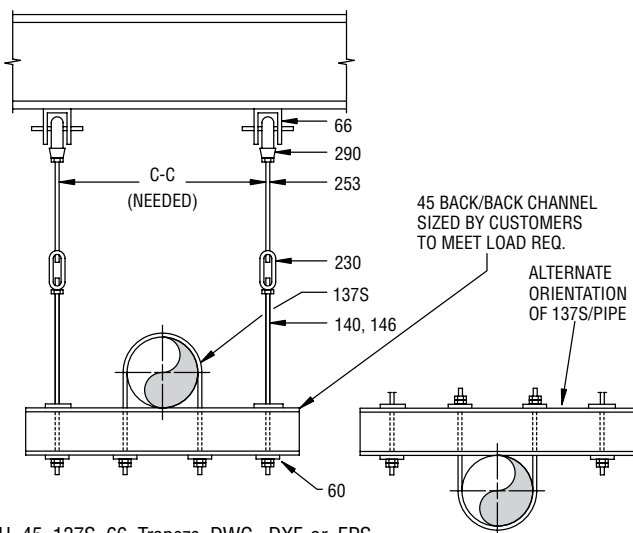
RH_212_290 .DWG, .DXF, or .EPS



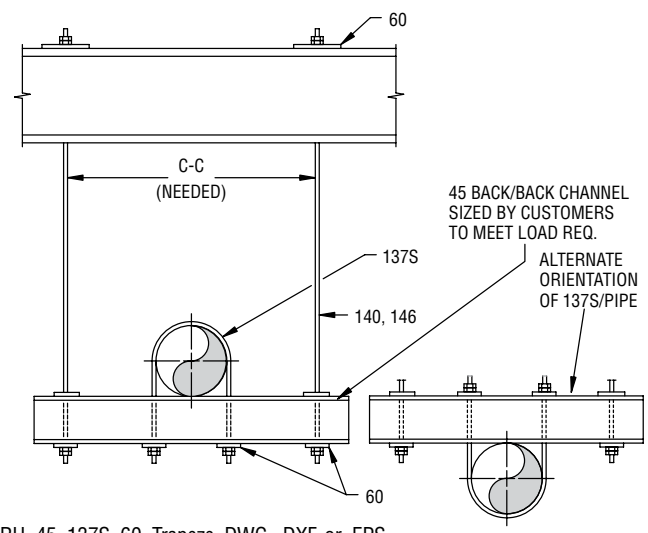
RH_212_290_299_55 .DWG, .DXF, or .EPS



RH_295_290_299_55 .DWG, .DXF, or .EPS



RH_45_137S_66_Trapeze .DWG, .DXF, or .EPS



RH_45_137S_60_Trapeze .DWG, .DXF, or .EPS

Each of these drawings are available on the Anvil web site in CAD format. The file name at the bottom of each box refers to that CAD file.

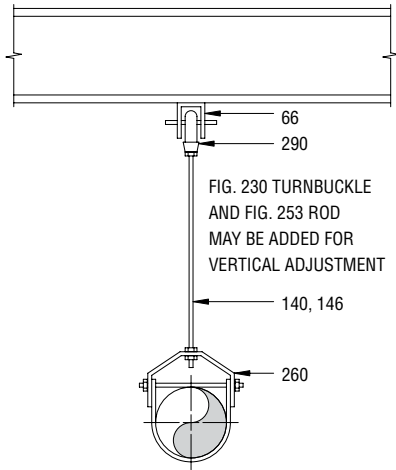
Rigid Hanger Assemblies (continued)

| | | | |
|---|--|---|--|
| | | | |
| <p>RH_181_157_218 .DWG, .DXF, or .EPS</p> | <p>RH_167_65_157_218 .DWG, .DXF, or .EPS</p> | <p>RH_65_157_218 .DWG, .DXF, or .EPS</p> | <p>RH_167_65_92 .DWG, .DXF, or .EPS</p> |
| | | | |
| <p>RH_295_290_228 .DWG, .DXF, or .EPS</p> | <p>RH_260_228 .DWG, .DXF, or .EPS</p> | <p>RH_212_290_228 .DWG, .DXF, or .EPS</p> | <p>RH_69_157_218 .DWG, .DXF, or .EPS</p> |
| | | | |
| <p>RH_65_86 .DWG, .DXF, or .EPS</p> | <p>RH_69_92 .DWG, .DXF, or .EPS</p> | <p>RH_295_290_60 .DWG, .DXF, or .EPS</p> | <p>RH_295_290_66 .DWG, .DXF, or .EPS</p> |

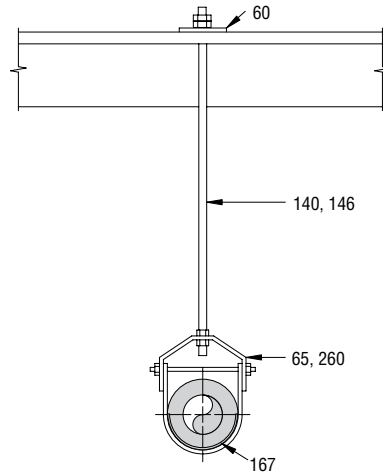
Each of these drawings are available on the Anvil web site in CAD format. The file name at the bottom of each box refers to that CAD file.

APPLICATION ASSEMBLY EXAMPLES

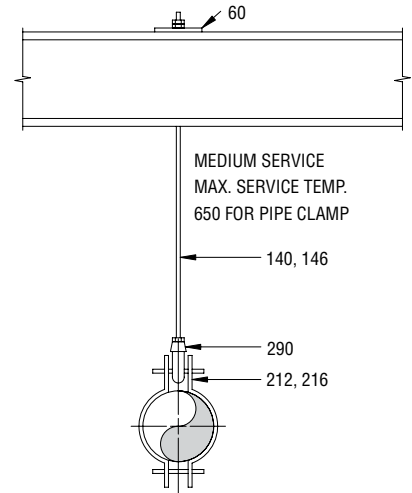
Rigid Hanger Assemblies (continued)



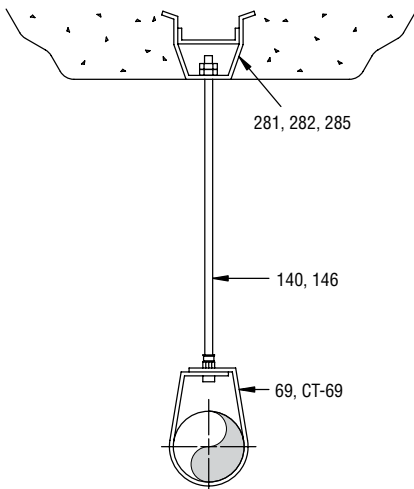
RH_260_290_66 .DWG, .DXF, or .EPS



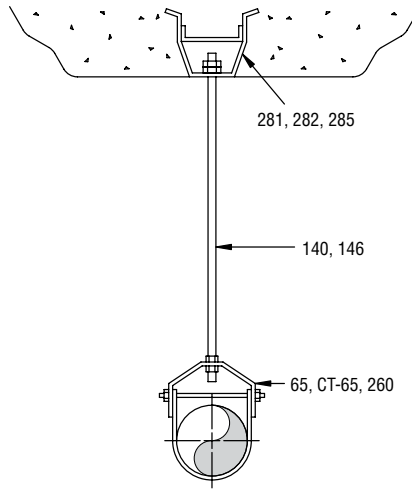
RH_167_65_60 .DWG, .DXF, or .EPS



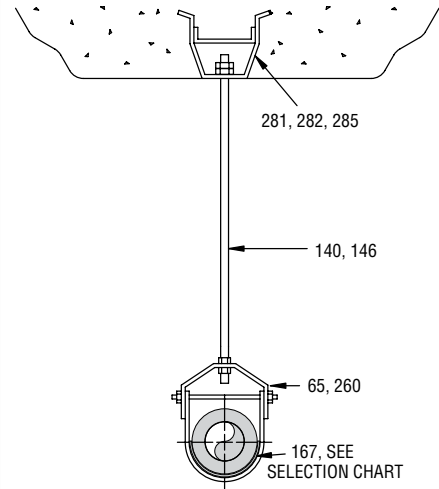
RH_212_290_60 .DWG, .DXF, or .EPS



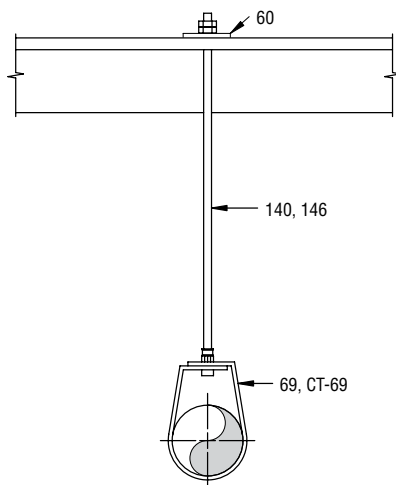
RH_69_281_CI .DWG, .DXF, or .EPS



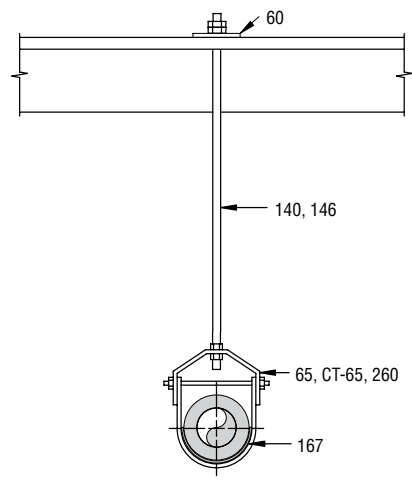
RH_65_281_CI .DWG, .DXF, or .EPS



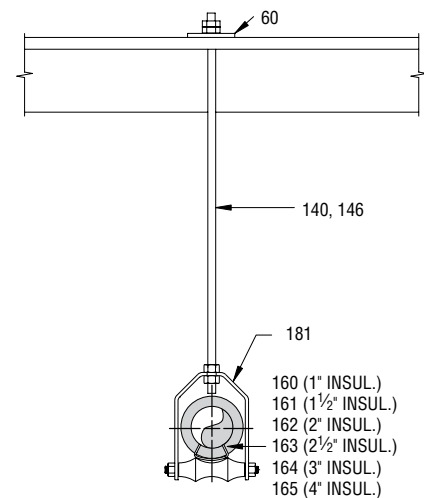
RH_167_65_281_CI .DWG, .DXF, or .EPS



RH_69_60 .DWG, .DXF, or .EPS



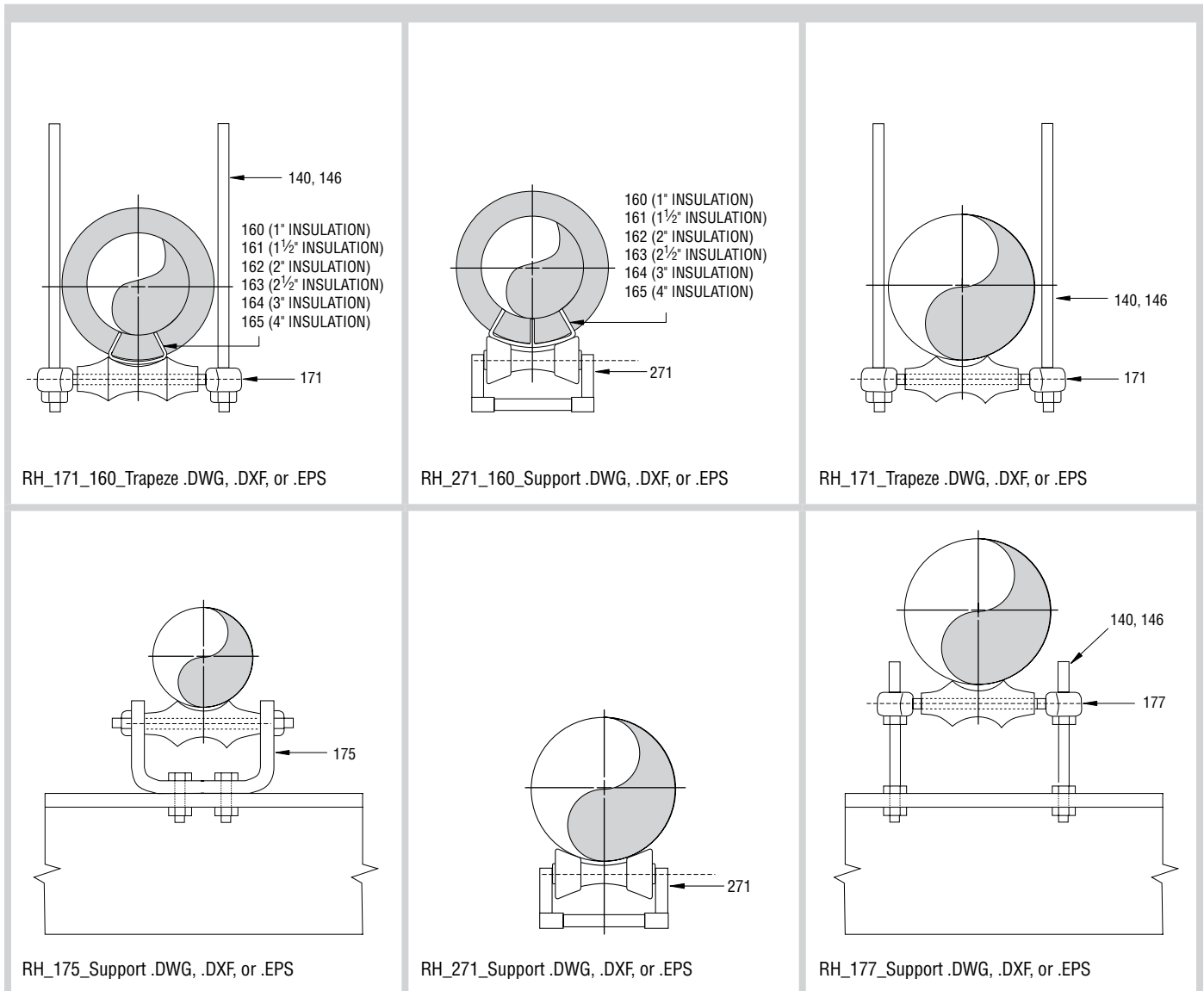
RH_160_181_60 .DWG, .DXF, or .EPS



RH_167_260_60 .DWG, .DXF, or .EPS

Each of these drawings are available on the Anvil web site in CAD format. The file name at the bottom of each box refers to that CAD file.

Rigid Hanger Assemblies (continued)



Each of these drawings are available on the Anvil web site in CAD format. The file name at the bottom of each box refers to that CAD file.

ANVIL COMPLIANCES, LISTINGS AND APPROVALS

Agency Listings and MSS-SP Types

| Anvil Figure Number | Product Types | | Application Sizes | | | | | | |
|---------------------|----------------------------|------------------------|-------------------|--------------|---------------|---------------|----------------|----------------|-----------------|
| | MSS SP-58 & ANSI/MSS SP-69 | Federal Specifications | | FM* Rod Size | FM* Pipe Size | UL ■ Rod Size | UL ■ Pipe Size | ULC ▲ Rod Size | ULC ▲ Pipe Size |
| | | WW-H-171-E | A-A-1192A | | | | | | |
| 14 | 27 | 54 | 27 | – | – | – | – | – | – |
| 40 | 42 | – | 42 | – | – | – | – | – | – |
| 45 | – | – | – | – | – | – | – | – | – |
| 46 | – | – | – | – | – | – | – | – | – |
| 47 | – | – | – | – | – | – | – | – | – |
| 49 | – | – | – | – | – | – | – | – | – |
| 50 | – | – | – | – | – | – | – | – | – |
| 52 | – | – | – | – | – | – | – | – | – |
| 54 | – | – | – | – | – | – | – | – | – |
| 55 | 57 | 57 | 57 | – | – | – | – | – | – |
| 55L | 57 | 57 | 57 | – | – | – | – | – | – |
| 60 | – | – | – | – | – | – | – | – | – |
| 62 | – | – | – | – | – | – | – | – | – |
| 63 | – | – | – | – | – | – | – | – | – |
| 65 | – | 1 | – | – | – | – | – | – | – |
| 66 | 22 | 22 | 22 | – | – | – | – | – | – |
| 67 | 5 | – | 5 | – | – | – | – | – | – |
| 69 | 10 | 10 | 10 | 3/8 | 3/4 - 4 | 3/8 | 3/4 - 4 | – | – |
| | | | | 1/2 | 5 - 8 | 1/2 | 5 - 8 | – | – |
| 86 | 23 | 23 | 23 | 3/8 | 3/4 - 4 | 3/8 | 3/4 - 4 | 3/8 | 3/4 - 4 |
| | | | | – | – | 1/2 | 5 - 8 | 1/2 | 5 - 8 |
| | | | | – | – | – | – | – | – |
| | | | | – | – | 3/4 | 12 | 3/4 | 12 |
| 88 | 23 | 23 | 23 | 3/8 | 3/4 - 4 | 3/8 | 3/4 - 4 | 3/8 | 3/4 - 4 |
| | | | | – | – | – | – | – | – |
| | | | | – | – | 3/4 | 12 | 3/4 | 12 |
| 89 | – | – | – | – | – | – | – | – | |
| 89X | – | – | – | – | – | up to 8 | – | up to 8 | |
| 92 | 19 & 23 | 23 | 19 & 23 | 3/8 | 3/4 - 4 | 3/8 | 3/4 - 4 | 3/8 | 2 1/2 - 4 |
| | | | | 1/2 | 5 - 8 | 1/2 | 5 - 8 | 1/2 | 5 - 8 |
| 93 | 19 & 23 | 23 | 19 & 23 | 3/8 | 3/4 - 4 | 3/8 | 3/4 - 4 | 3/8 | 2 1/2 - 4 |
| | | | | 1/2 | 5 - 8 | 1/2 | 5 - 8 | 1/2 | 5 - 8 |
| 94 | 19 | 19 | 19 | – | – | 5/8 | 10, 12 | – | – |
| | | | | – | – | 3/4 | 12 | – | – |
| 95 | 23 | 23 | 23 | 3/8, 1/2 | – | 3/8 | – | – | – |
| 100 | – | – | – | – | – | – | – | – | – |
| 103 | – | – | – | – | – | – | – | – | – |
| 104 | 6 | 6 | 6 | – | – | – | – | – | – |
| 108 | 11 | 11 | 11 | – | – | – | – | – | – |
| 110R | 16 | 16 | 16 | 3/8 | 3/4 - 4 | 3/8 | 3/4 - 4 | – | – |
| | | | | 1/2 | 5 - 8 | 1/2 | 5 - 8 | – | – |
| | | | | – | – | 5/8 | 10, 12 | – | – |
| | | | | – | – | 3/4 | 12 | – | – |
| – | – | – | – | 7/8 | 12 | – | – | – | |
| 112 | – | – | – | – | – | – | – | – | |
| 113 | – | – | – | – | – | – | – | – | |
| 114 | 15 | 15 | 15 | – | – | – | – | – | – |
| 120 | – | – | – | – | – | – | – | – | – |
| 126 | – | – | – | – | – | – | – | – | – |
| 127 | – | – | – | – | – | – | – | – | – |
| 128R | – | – | – | – | – | – | – | – | – |
| 133 | 21 | 21 | 21 | – | – | 3/8 | 3/4 - 4 | – | – |
| | | | | – | – | 1/2 | 5 - 8 | – | – |

* = FM Approved ■ = UL Listed ▲ = ULC Listed

ANVIL COMPLIANCES, LISTINGS AND APPROVALS

Agency Listings and MSS-SP Types

(cont.)

| Anvil Figure Number | Product Types | | | Application Sizes | | | | | |
|---------------------|----------------------------|------------------------|-----------|-------------------|---------------|---------------|----------------|----------------|-----------------|
| | MSS SP-58 & ANSI/MSS SP-69 | Federal Specifications | | FM* Rod Size | FM* Pipe Size | UL ■ Rod Size | UL ■ Pipe Size | ULC ▲ Rod Size | ULC ▲ Pipe Size |
| | | WW-H-171-E | A-A-1192A | | | | | | |
| 134 | 21 | 21 | 21 | 1/2 | 5 - 8 | 1/2 | 5 - 8 | - | - |
| | | | | 5/8 | 10 - 12 | 5/8 | 10 - 12 | - | - |
| 135 | - | - | - | - | - | - | - | - | - |
| 135E | - | - | - | - | - | - | - | - | - |
| 135R | - | - | - | - | - | - | - | - | - |
| 136 | - | - | - | 3/8 | 3/4 - 4 | 3/8 | 3/4 - 4 | 3/8 | 3/4 - 4 |
| | - | - | - | 1/2 | 5 - 8 | 1/2 | 5 - 8 | 1/2 | 5 - 8 |
| | - | - | - | - | - | 5/8 | 10, 12 | 5/8 | 10, 12 |
| | - | - | - | - | - | 3/4 | 12 | 3/4 | 12 |
| | - | - | - | - | - | 7/8 | 12 | 7/8 | 12 |
| 136R | - | - | - | - | - | 3/8 | 3/4 - 4 | - | - |
| | - | - | - | - | - | 1/2 | 5 - 8 | - | - |
| 137 | 24 | 24 | 24 | - | - | - | - | - | - |
| 137C | 24 | 24 | 24 | - | - | - | - | - | - |
| 137S | - | - | - | - | - | - | - | - | - |
| 138R | 12 | 25 | 12 | - | - | - | - | - | - |
| 140 | - | - | - | - | - | - | - | - | - |
| 142 | - | - | - | - | - | - | - | - | - |
| 146 | - | - | - | - | - | - | - | - | - |
| 148 | - | - | - | - | - | - | - | - | - |
| 152 | - | - | - | 3/8 | 3/4 - 2 | 3/8 | 3/4 - 4 | 3/8 | 3/4 - 4 |
| | - | - | - | 1/2 | 2 1/2 - 3 1/2 | 1/2 | 5 - 8 | 1/2 | 5 - 8 |
| | - | - | - | 5/8 | 4, 5 | 5/8 | 10, 12 | 5/8 | 10, 12 |
| | - | - | - | 3/4 | 6 | 3/4 | 12 | 3/4 | 12 |
| | - | - | - | 7/8 | 8 | 7/8 | 12 | 7/8 | 12 |
| 153 | - | - | - | 3/8 | 3/4 - 4 | 3/8 | 3/4 - 4 | 3/8 | 3/4 - 4 |
| | - | - | - | 1/2 | 5 - 8 | 1/2 | 5 - 8 | 1/2 | 5 - 8 |
| | - | - | - | - | - | 5/8 | 10, 12 | 5/8 | 10, 12 |
| | - | - | - | - | - | 3/4 | 12 | 3/4 | 12 |
| 157 | - | - | - | - | - | - | 12 | - | 12 |
| | - | - | - | 3/8 | 3/4 - 4 | 3/8 | 3/4 - 4 | - | - |
| | - | - | - | 1/2 | 5 - 8 | 1/2 | 5 - 8 | - | - |
| | - | - | - | - | - | 5/8 | 10, 12 | - | - |
| | - | - | - | - | - | 3/4 | 12 | - | - |
| 160 | 39A & 39B | 40A & 40B | 39A & 39B | - | - | - | - | - | - |
| 161 | 39A & 39B | 40A & 40B | 39A & 39B | - | - | - | - | - | - |
| 162 | 39A & 39B | 40A & 40B | 39A & 39B | - | - | - | - | - | - |
| 163 | 39A & 39B | 40A & 40B | 39A & 39B | - | - | - | - | - | - |
| 164 | 39A & 39B | 40A & 40B | 39A & 39B | - | - | - | - | - | - |
| 165 | 39A & 39B | 40A & 40B | 39A & 39B | - | - | - | - | - | - |
| 165A | 39A & 39B | 40A & 40B | 39A & 39B | - | - | - | - | - | - |
| 166A | 39A & 39B | 40A & 40B | 39A & 39B | - | - | - | - | - | - |
| 167 | 40 | 41 | 40 | - | - | - | - | - | - |
| 168 | 40 | 41 | 40 | - | - | - | - | - | - |
| 171 | 41 | 42 | 41 | - | - | - | - | - | - |
| 175 | 44 | 45 | 44 | - | - | - | - | - | - |
| 177 | 41 | 42 | 41 | - | - | - | - | - | - |
| 178 | 49 | 50 | 49 | - | - | - | - | - | - |
| 181 | 43 | 44 | 43 | - | - | - | - | - | - |
| 185 | - | - | - | - | - | - | 3/4 - 2 | - | 3/4 - 2 |
| 186 | - | - | - | - | - | - | 3/4 - 2 | - | 3/4 - 2 |
| 187 | - | - | - | - | - | - | 3/4 - 2 | - | 3/4 - 2 |
| 188 | - | - | - | - | - | - | 3/4 - 2 | - | 3/4 - 2 |
| 189 | - | - | - | 3/8 | 3/4 - 4 | 3/8 | 3/4 - 4 | 3/8 | 3/4 - 4 |

*= FM Approved ■ = UL Listed ▲ = ULC Listed



ANVIL COMPLIANCES, LISTINGS AND APPROVALS

Agency Listings and MSS-SP Types

(cont.)

| Anvil Figure Number | Product Types | | | Application Sizes | | | | | |
|---------------------|----------------------------|------------------------|-----------|-------------------|---------------|---------------|----------------|----------------|-----------------|
| | MSS SP-58 & ANSI/MSS SP-69 | Federal Specifications | | FM* Rod Size | FM* Pipe Size | UL ■ Rod Size | UL ■ Pipe Size | ULC ▲ Rod Size | ULC ▲ Pipe Size |
| | | WW-H-171-E | A-A-1192A | | | | | | |
| 190 | – | – | – | 3/8 | 3/4 - 4 | 3/8 | 3/4 - 4 | 3/8 | 3/4 - 4 |
| 191 | 37 | 38 | 37 | – | – | – | – | – | – |
| 192 | 38 | 39 | 38 | – | – | – | – | – | – |
| 194 | 31 | 32 | 31 | 3/8 | 3/4 - 4 | – | – | – | – |
| | | | | 1/2 | 5 - 8 | – | – | – | – |
| | | | | – | – | – | – | – | – |
| | | | | – | – | – | – | – | – |
| 195 | 32 | 33 | 32 | – | – | – | – | – | – |
| 199 | 33 | 34 | 33 | – | – | – | – | – | – |
| 202 | 34 | 35 | 34 | 3/8 | 3/4 - 4 | 3/8 | 1 - 4 | 3/8 | 1 - 4 |
| | | | | 1/2 (Steel beam) | 5 - 8 | 1/2 | 5 - 8 | 1/2 | 5 - 8 |
| | | | | – | – | 5/8 | 10, 12 | 5/8 | 10, 12 |
| 206 | 34 | 35 | 34 | 3/8 (Steel) | 3/4 - 4 | 3/8 | 3/4 - 4 | – | – |
| | | | | 1/2 (Steel) | 5 - 8 | 1/2 | 5 - 8 | – | – |
| | | | | – | – | 3/8 | 10, 12 | – | – |
| 207 | 34 | 35 | 34 | 3/8 (Steel) | 3/4 - 4 | 3/8 | 3/4 - 4 | – | – |
| | | | | – | – | 1/2 | 5 - 8 | – | – |
| 212 | 4 | 4 | 4 | 3/8 | 3/4 - 2 | 3/8 | 3/4 - 4 | 3/8 | 3/4 - 4 |
| | | | | 1/2 | 2 1/2 - 3 1/2 | 1/2 | 5 - 8 | 1/2 | 5 - 8 |
| | | | | 5/8 | 4, 5 | – | – | – | – |
| | | | | 3/4 | 6 | – | – | – | – |
| | | | | 7/8 | 8 | – | – | – | – |
| 212FP | 4 | 4 | 4 | – | – | – | – | – | – |
| 216 | 4 | 4 | 4 | – | – | – | – | – | – |
| 217 | 25 | – | 25 | – | – | – | – | – | – |
| 218 | 30 | 30 | 30 | 3/8 | 3/4 - 4 | 3/8 | 3/4 - 4 | 3/8 | 3/4 - 4 |
| | | | | – | – | 1/2 | 5 - 8 | 1/2 | 5 - 8 |
| | | | | – | – | 5/8 | 10, 12 | 5/8 | 10, 12 |
| | | | | – | – | 3/4 | 12 | 3/4 | 12 |
| | | | | – | – | 7/8 | 12 | 7/8 | 12 |
| 224 | 2 | 2 | 2 | – | – | – | – | – | – |
| 227 | 25 | – | 25 | 3/8 | 3/4 - 4 | 3/8 | 3/4 - 4 | – | – |
| | | – | | – | 1/2 | 5 - 8 | – | – | |
| 228 | 28 & 29 | 30 & 31 | 28 & 29 | – | – | – | – | – | – |
| 228L | 28 & 29 | 30 & 31 | 28 & 29 | – | – | – | – | – | – |
| 230 | 13 | 13 | 13 | – | – | – | – | – | – |
| 233 | 13 | 13 | 13 | – | – | – | – | – | – |
| 243 | – | – | – | – | – | – | – | – | – |
| 244 | – | – | – | – | – | – | – | – | – |
| 246 | 2 | 2 | 2 | – | – | – | – | – | – |
| 248 | – | – | – | – | – | – | – | – | – |
| 248L | – | – | – | – | – | – | – | – | – |
| 248X | – | – | – | – | – | – | – | – | – |
| 253 | – | – | – | – | – | – | – | – | – |
| 255 | – | – | – | – | – | – | – | – | – |
| 256 | – | – | – | – | – | – | – | – | – |
| 257 | 35 | – | 35 | – | – | – | – | – | – |
| 257A | – | – | – | – | – | – | – | – | – |
| 258 | 36 | 36 & 37 | 36 | – | – | – | – | – | – |
| 259 | 37 | – | 37 | – | – | – | – | – | – |

* = FM Approved ■ = UL Listed ▲ = ULC Listed

ANVIL COMPLIANCES, LISTINGS AND APPROVALS

Agency Listings and MSS-SP Types

(cont.)

| Anvil Figure Number | Product Types | | | Application Sizes | | | | | |
|---------------------|----------------------------|------------------------|-----------|-------------------|---------------|---------------|----------------|----------------|-----------------|
| | MSS SP-58 & ANSI/MSS SP-69 | Federal Specifications | | FM* Rod Size | FM* Pipe Size | UL ■ Rod Size | UL ■ Pipe Size | ULC ▲ Rod Size | ULC ▲ Pipe Size |
| | | WW-H-171-E | A-A-1192A | | | | | | |
| 260 | 1 | 1 | 1 | 3/8 | 3/4 - 2 | 3/8 | 3/4 - 4 | 3/8 | 3/4 - 4 |
| | | | | 1/2 | 2 1/2 - 3 | 1/2 | 5 - 8 | - | - |
| | | | | 5/8 | 4, 5 | - | - | - | - |
| | | | | 3/4 | 6 | - | - | - | - |
| | | | | 7/8 | 8 | - | - | - | - |
| 261 | 8 | 8 | 8 | - | - | - | 1 1/2 - 8 | - | 1 1/2 - 8 |
| 262 | 26 | 26 | 26 | - | - | - | - | - | - |
| 264 | 38 | 39 | 38 | - | - | - | - | - | - |
| 265 | 38 | 39 | 38 | - | - | - | - | - | - |
| 271 | 44 | 45 | 44 | - | - | - | - | - | - |
| 274 | 46 | 47 | 46 | - | - | - | - | - | - |
| 274P | - | - | - | - | - | - | - | - | - |
| 275 | - | - | - | - | - | - | - | - | - |
| 277 | 45 | 46 | 45 | - | - | - | - | - | - |
| 278 | - | - | - | - | - | - | - | - | - |
| 278L | - | - | - | - | - | - | - | - | - |
| 278X | - | - | - | - | - | - | - | - | - |
| 281 | 18 | 19 | 18 | 3/8 | 3/4 - 4 | 3/8 | 3/4 - 4 | 3/8 | 3/4 - 4 |
| | | | | 1/2 | 5 - 8 | 1/2 | 5 - 8 | 1/2 | 5 - 8 |
| | | | | 5/8 | 8 MAX. | 5/8 | 10, 12 | 5/8 | 10, 12 |
| | | | | 3/4 | 8 MAX. | 3/4 | 12 | 3/4 | 12 |
| 282 | 18 | 18 | 18 | 3/8 | 3/4 - 4 | 3/8 | 3/4 - 4 | 3/8 | 3/4 - 4 |
| | | | | 1/2 | 5 - 8 | 1/2 | 5 - 8 | 1/2 | 5 - 8 |
| | | | | 5/8 | 8 MAX. | 5/8 | 10, 12 | 5/8 | 10, 12 |
| | | | | 3/4 | 8 MAX. | 3/4 | 12 | 3/4 | 12 |
| | | | | 7/8 | 8 MAX. | 7/8 | 12 | 7/8 | 12 |
| 284 | - | - | - | - | - | - | - | - | - |
| 285 | 19 | 18 | 18 | 3/8 | 3/4 - 4 | 3/8 | 3/4 - 4 | 3/8 | 3/4 - 4 |
| | | | | 1/2 | 5 | 1/2 | 5 - 8 | 1/2 | 5 - 8 |
| | | | | - | - | 5/8 | 10, 12 | 5/8 | 10, 12 |
| 286 | 18 | 18 | 18 | - | - | - | - | - | - |
| 290 | 17 | 17 | 17 | - | - | - | - | - | - |
| 290L | 17 | 17 | 17 | - | - | - | - | - | - |
| 291 | - | - | - | - | - | - | - | - | - |
| 292 | 28 & 29 | 28 & 29 | 28 & 29 | - | - | - | - | - | - |
| 292L | 28 & 29 | 28 & 29 | 28 & 29 | - | - | - | - | - | - |
| 295 | 3 | 3 | 3 | - | - | - | - | - | - |
| 295A | 3 | 3 | 3 | - | - | - | - | - | - |
| 295H | 3 | 3 | 3 | - | - | - | - | - | - |
| 299 | 14 | 14 | 14 | - | - | - | - | - | - |
| 300 | 1 | 1 | 1 | - | - | - | - | - | - |
| 395 | - | - | - | - | - | - | - | - | - |
| 432 | - | - | - | - | - | - | - | - | - |
| 436 | 35 | - | 35 | - | - | - | - | - | - |
| 436A | - | - | - | - | - | - | - | - | - |
| 439 | 35 | - | 35 | - | - | - | - | - | - |
| 590 | 1 | 1 | 1 | - | - | - | - | - | - |
| 594 | - | - | - | - | - | - | - | - | - |
| 595 | 8 | - | 8 | - | - | - | - | - | - |
| 599 | - | - | - | - | - | - | - | - | - |
| 600 | 8 | - | 8 | - | - | - | - | - | - |
| 777 | - | - | - | - | - | 3/8 | 1 - 4 | 3/8 | 1 - 4 |

*= FM Approved ■ = UL Listed ▲ = ULC Listed



ANVIL COMPLIANCES, LISTINGS AND APPROVALS

Agency Listings and MSS-SP Types

(cont.)

| Anvil Figure Number | Product Types | | Application Sizes | | | | | | |
|---------------------|----------------------------|------------------------|-------------------|--------------|---------------|---------------|----------------|----------------|-----------------|
| | MSS SP-58 & ANSI/MSS SP-69 | Federal Specifications | | FM* Rod Size | FM* Pipe Size | UL ■ Rod Size | UL ■ Pipe Size | ULC ▲ Rod Size | ULC ▲ Pipe Size |
| | | WW-H-171-E | A-A-1192A | | | | | | |
| CT-65 | – | 1 | – | – | – | – | – | – | – |
| CT-69 | 10 | 10 | 10 | – | – | – | – | – | – |
| CT-121 | 8 | 8 | 8 | – | – | – | – | – | – |
| CT-128C | – | – | – | – | – | – | – | – | – |
| CT-138R | 12 | 25 | 12 | – | – | – | – | – | – |
| CT-255 | – | – | – | – | – | – | – | – | – |

A type is dependent upon its appropriate installation and use. Note: Figure 218 must be used with Figure 157.

*= FM Approved ■ = UL Listed ▲ = ULC Listed

| SEISMIC SWAY BRACE COMPLIANCES, LISTINGS AND APPROVALS | | | | | |
|--|--|--------------------|---------------------------|---------------------|-------|
| Anvil Figure Number | Application Sizes for Schedule 10 & 40 | | | | |
| | FM Pipe Size | UL & ULC Pipe Size | UL & ULC Flange Thickness | FM Flange Thickness | OSHPD |
| 770 | 1 - 6 (A) | 1 - 6 (B) | – | – | X |
| 771 | 1 - 8 | 1 - 8 | – | – | X |
| 772 | 1 - 8 | 1 - 8 | ½ - 1¼ | ¾ - 1¼ | X |
| 775 | 2½ - 8 (D) | 2½ - 8 | – | – | X |
| 776 | 2½ - 8 (D) | – | – | – | X |
| 778 | 1 - 8 | 1 - 8 | ½, ¼, ⅜ | ⅛ - ¾ | X |
| 779 | – | 1 - 8 | – | – | – |

| SEISMIC RESTRAINT COMPLIANCES, LISTINGS AND APPROVALS | | | |
|---|--|--------------|----------------|
| Anvil Figure Number | Application Sizes for Schedule 10 & 40 | | |
| | UL Rod Size | UL Pipe Size | UL Brace Angle |
| 770 | – | 1 - 2 | – |
| 773 | ⅜ | ¾ - 2 | – |
| 777 | ⅜ | ¾ - 2 | 0 - 90° |

A - Sch. 40, Sch. 10 IPS and Flow Pipe

B - Sch. 40 1" - 6"; Sch. 10 1¼" - 6"

D - Sch. 10 and Sch. 40 2½" - 8". Flow Pipe 2½" - 6"

OSHPD - State of California Office of Statewide Health Planning and Development

Note: Refer to UL/ULC & FM websites for load and size combinations.

| ENGINEERED HANGERS - COMPLIANCES, LISTINGS AND APPROVALS | | | |
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| | MSS-SP-58 & MSS-SP-69 | Federal Specifications | |
| | | WW-H-171-E | A-A-1192A |
| 170 - Horizontal Traveler | 58 | - | - |
| 200, C-200, 201 and C-201 - Hydraulic Snubbers | 47 | - | - |
| 211, C-211, 640, C-640 - Sway Strut Assembly | - | - | - |
| 222 and C-222 - Mini-Sway Strut Assembly | - | - | - |
| 247 - Light Duty Spring | 48 | 49 | 49 |
| 296, C-296, 297, C-297, 298, C-298, 301, C-301 & 302 - Sway Brace | 50 | 55 | 55 |
| 312 - Tapered Pin | - | - | - |
| 3306 & 3307 - Hydraulic Snubbers | 47 | - | - |
| Variable Spring Hangers | | | |
| 82, B-268, 98, Triple, Quadruple Type A-E | 51 | 51 | 51 |
| C-82, C-268, C-98, Triple-CR, Quadruple-CR Type A-E | 51 | 51 | 51 |
| 82, B-268, 98, Triple, Quadruple Type F | 52 | 56 | 56 |
| C-82, C-268, C-98, Triple-CR, Quadruple-CR Type F | 52 | 56 | 56 |
| 82, B-268, 98, Triple, Quadruple Type G | 53 | 57 | 57 |
| C-82, C-268, C-98, Triple-CR, Quadruple-CR Type G | 53 | 57 | 57 |
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| 2 | 224 |
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| 6 | 104 |
| 8 | 261 |
| | 595 |
| | 600 CT-121 |
| 10 | 69 CT-69 |
| 11 | 108 |
| 12 | 138R |
| | CT-138R |
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| 14 | 299 |
| 15 | 114 |
| 16 | 110R |
| 17 | 290 |
| | 290L |
| | 281 |
| 18 | 282 |
| | 286 |
| | 92 |
| | 93 |
| 19 | 94 |
| | 285 |
| | 133 |
| | 134 |
| 22 | 66 |
| | 86 |
| 23 | 88 |
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| | 95 |
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| 24 | 137C |
| | 217 |
| 25 | 227 |

| Type MSS SP-58 & ANSI/MSS SP-69 | Anvil Figure Number |
|--|------------------------|
| 26 | 262 |
| 27 | 14 |
| 28 | 228 |
| | 228L |
| | 292 |
| | 292L |
| 30 | 218 |
| 29 | 228 |
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| | 292 |
| | 292L |
| 31 | 194 |
| 32 | 195 |
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| | 168 |
| 41 | 171 |
| | 177 |
| 42 | 40 |
| 43 | 181 |
| 44 | 175 |
| | 271 |
| 45 | 277 |
| 46 | 274 |
| 47 | 200, C-200 |
| | 201, C-201 |
| | 3306 |
| | 3307 |

| Type MSS SP-58 & ANSI/MSS SP-69 | Anvil Figure Number | |
|--|------------------------|----------------------------|
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| 49 | 178 | |
| 50 | 296, C-296 | |
| | 297, C-297 | |
| | 298, C-298 | |
| | 301, C-301 | |
| | 302 | |
| 51 | Type A-E | 82, C-82 |
| | | 98, C-98 |
| | | B-268, C-268 |
| | | Triple Spring Hanger |
| | | Triple-CR Spring Hanger |
| 52 | Type F | 82, C-82 |
| | | 98, C-98 |
| | | B-268, C-268 |
| | | Triple Spring Hanger |
| | | Triple-CR Spring Hanger |
| 53 | Type G | 82, C-82 |
| | | 98, C-98 |
| | | B-268, C-268 |
| | | Triple Spring Hanger |
| | | Triple-CR Spring Hanger |
| 54 | 81-H Type A-E | |
| | C-81-H Type A-E | |
| 55 | 80-V Type A-E | |
| 56 | C-80-V Type A-E | |
| | 80-V Type G | |
| 57 | C-80-V Type G | |
| | 55 | |
| 58 | 55L | |
| | 170 | |

Pipe Hanger & Support

- Hardware Hangers Complete Product Line of:
 - Carbon Steel, Stainless Steel
 - Cast Iron, Malleable Iron
 - Copper & PVC Coated
 - Plain, Galvanized & Painted
- Engineered Hangers
 - Variable Springs
 - Constant Supports
 - Hydraulic Snubbers
 - Vibration Sway Braces
 - Sway Struts
 - Limit Stops
- Special Structural Steel, Fabrication/Miscellaneous
- Special Design Products per Customer Specifications
- Domestic Manufactured Product Line

Anvil Markets

- Fire Protection
- Mechanical HVAC/Plumbing
- Industrial
- Petro Chemical
- Refinery
- Pulp & Paper
- Waste Water, Water Treatment
- Marine
- Co-generation
- Fossil Power
- Nuclear Power
- Seismic

Technical Services

- Design services, either on or off site, help you maximize the efficiency of your pipe support systems. These services include:
 - Pipe Hanger design and engineering
 - Drafting Services
 - System Analysis
 - Pipe Stress Analysis
 - Product Qualification Testing
 - Supervision of client design personnel
 - HYDRAULIC SNUBBERS:
 - The Pipe Support Division has the technical expertise, manufacturing facilities and testing equipment to provide extensive design, installation, maintenance and repair or rebuild services for hydraulic shock suppressors.
 - On site service available by certified technicians for fossil and nuclear plants.

Pipe Hanger Specifications

- Federal Spec WW-H-171E and A-A-1192A
- Underwriters Laboratory
- Factory Mutual (FM)
- Manufacturers Standardization Society (MSS) SP-58, SP-69, SP-77, SP-89 and SP-90
- National Fire Protection Association (NFPA)
- ASME Boiler and Pressure Vessel Code
 - Section III (Nuclear)
 - B31.1 Power Piping
 - B31.3 Chemical Plant and Petroleum Refinery Piping
 - B31.9 Building Services Piping
- MIL Spec P-15877 Marine Hangers
- FIELD SERVICES:
 - Support walk downs and verification
 - QA/QC services for on site or off site work
 - Support adjustments and materials
 - QA inspection and verification
 - Integrity Analysis
 - Non-destructive Examination
 - Training Programs
- Nuclear services geared to nuclear power market include:
 - Section XI Services
 - Compliance with NRC directives involving piping systems and components
 - Accredited by and granted an "NPT" Certificate of Authorization and "NS" Certificate of Accreditation
 - Quality activities audited by NUPIC and various individual utilities
 - Commercial grade dedication program.

Electronic Pipe Support Catalog

- Available on-line on our web site
- Export CAD drawings to most CAD programs (EPS, DXF and DWG).
- Quick Retrieval of Product Data
- A Faster Way to Build Product Submittals

Web Site Address

<http://www.anvilintl.com>

ANVIL TERMS OF SALE AND CONDITIONS

1. CONTROLLING PROVISIONS: These terms and conditions shall control with respect to any purchase order or sale of Seller's products. No waiver, alteration or modification of these terms and conditions whether on Buyer's purchase order or otherwise shall be valid unless the waiver, alteration or modification is specifically accepted in writing and signed by an authorized representative of Seller.

2. DELIVERY: Seller will make every effort to complete delivery of products as indicated on Seller's acceptance of an order, but Seller assumes no responsibility or liability, and will accept no back charge, for loss or damage due to delay or inability to deliver caused by acts of God, war, labor difficulties, accident, delays of carriers, by contractors or suppliers, inability to obtain materials, shortages of fuel and energy, or any other causes of any kind whatever beyond the control of Seller. Seller may terminate any contract of sale of its products without liability of any nature, by written notice to Buyer, in the event that the delay in delivery or performance resulting from any of the aforesaid causes shall continue for a period of sixty (60) days. Under no circumstances shall Seller be liable for any special or consequential damages or for loss, damage, or expense (whether or not based on negligence) directly or indirectly arising from delays or failure to give notice of delay.

3. WARRANTY: Seller warrants for one year from the date of shipment Seller's manufactured products to the extent that Seller will replace those having defects in material or workmanship when used for the purpose and in the manner which Seller recommends. If Seller examination shall disclose to its satisfaction that the products are defective, and an adjustment is required, the amount of such adjustment shall not exceed the net sales price of the defective products and no allowance will be made for labor or expense of repairing or replacing defective products or workmanship of damage resulting from the same. Seller warrants the products which it sells of other manufacturers to the extent of the warranties of their respective makers. Where engineering design or fabrication work is supplied, Buyer's acceptance of Seller's design or of delivery of work shall relieve Seller of all further obligation, other than expressed in Seller's product warranty. THIS IS SELLER'S SOLE WARRANTY. SELLER MAKES NO OTHER WARRANTY OF ANY KIND, EXPRESSED OR IMPLIED AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FOR A PARTICULAR PURPOSE WHICH EXCEED SELLER'S AFORESTATED OBLIGATION ARE HEREBY DISCLAIMED BY SELLER AND EXCLUDED FROM THIS WARRANTY. Seller neither assumes, nor authorizes any person to assume for it, any other obligation in connection with the sale of its engineering designs or products. This warranty shall not apply to any products or parts of products which (a) have been repaired or altered outside of Seller's factory, in any manner; (b) have been subjected to misuse, negligence or accidents; (c) have been used in a manner contrary to Seller's instructions or recommendations. Seller shall not be responsible for design errors due to inaccurate or incomplete information supplied by Buyer or its representatives.

4. SELLER'S LIABILITY: Seller will not be liable for any loss, damage, cost of repairs, incidental or consequential damages of any kind, whether based upon warranty (except for the obligation accepted by Seller under "Warranty" above), contract or negligence, arising in connection with the design, manufacture, sale, use or repair of the products or of the engineering designs supplied to Buyer.

5. RETURNS: Seller cannot accept return of any products unless its written permission has been first obtained, in which case same will be credited subject to the following: (a) all material returned must, on its arrival at Seller's Plant, be found to be in first-class condition; if not, cost of putting in saleable condition will be deducted from credit

memoranda; (b) a handling charge deduction of twenty percent (20%) will be made from all credit memoranda issued for material returned; and (c) transportation charges, if not prepaid will be deducted from credit memoranda.

6. SHIPMENTS: All products sent out will be carefully examined, counted and packed. The cost of any special packing or special handling caused by Buyer's requirements or requests shall be added to the amount of the order. No claim for shortages will be allowed unless made in writing within ten (10) days of receipt of a shipment. Claims for products damaged or lost in transit should be made on the carrier, as Seller's responsibility ceases, and title passes, on delivery to the carrier.

7. SPECIAL PRODUCTS: Orders covering special or nonstandard products are not subject to cancellation except on such terms as Seller may specify on application.

8. PRICES AND DESIGNS: Prices and designs are subject to change without notice. All prices are F.O.B. Point of shipment, unless otherwise stated.

9. TAXES: The amount of any sales, excise or other taxes, if any, applicable to the products covered by this order, shall be paid by Buyer unless Buyer provides Seller with an exemption certificate acceptable to the taxing authorities.

10. NUCLEAR PLANTS: Where the products, engineering design or fabrication are utilized in nuclear plant applications, Buyer agrees: (a) to take all necessary steps to add Seller as an insured under the property insurance policies and nuclear liability insurance policies covering the nuclear power plant facility at which the products, engineering design or fabrication are utilized; (b) to obtain a waiver of any claims against Seller by the nuclear power plant owner and a waiver of subrogation against Seller from such owners' property insurer with respect to any loss or damage to property at the nuclear power plant site arising from the products, engineering design or fabrication; (c) to indemnify and hold Seller harmless against all claims, costs, expenses (including attorneys fees), loss, damage, or other liability that Seller would not have incurred but for Buyer's failure to comply with subsections (a) and (b) of this Section 10; and (d) to indemnify and hold Seller harmless with respect to any personal injury (or death), property damage or other loss resulting from a nuclear incident which is caused directly or indirectly by defective design, material or workmanship furnished by Seller.

11. MINIMUM INVOICE: \$100.00 plus transportation.

12. TERMS: Cash, net 30 days unless otherwise specified.

NOTE: All orders are accepted on the basis of prices in effect at the time of shipment.

NOTICE: The prices and terms quoted, there will be added any manufacturers or sales tax payable on the transaction under any effective statute.

FREIGHT ALLOWANCE: All prices are F.O.B. point of shipment. On (non-engineered product) shipments of 2,500 pounds or more, rail freight or motor freight at the lowest published rates is allowed to all continental U.S. rail points or all U.S. highway points listed in published tariffs (Alaska and Hawaii excluded). In no case will more than actual freight be allowed.

EXCEPTIONS: All Constant Supports, Spring Hangers, Sway Braces and all Engineered, Bundled and Tagged Hanger Assemblies are F.O.B. Plants, with No Freight Allowed.



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Note #1: Charts and Tables

Charts and tables in this section are compiled from information published by nationally recognized organizations and are intended for use as a guide only. Anvil International ("Anvil") recommends that users of this information determine the validity of such information as applied to their own applications.

Fig. 14 thru Fig. 175

● = Columbia, PA ■ = North Kingstown, RI ▲ = Henderson, TN
 † = Regional Service Centers * = rod dia. over 1½" (North Kingstown, RI)
 For contact information for the locations listed above, please refer to the back cover.

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● = Columbia, PA ■ = North Kingstown, RI ▲ = Henderson, TN
 † = Regional Service Centers * = rod dia. over 1½" (North Kingstown, RI)
 For contact information for the locations listed above, please refer to the back cover.

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Fig. AF074 thru Triple Spring

● = Columbia, PA ■ = North Kingstown, RI ▲ = Henderson, TN
 † = Regional Service Centers * = rod dia. over 1½" (North Kingstown, RI)
 For contact information for the locations listed above, please refer to the back cover.

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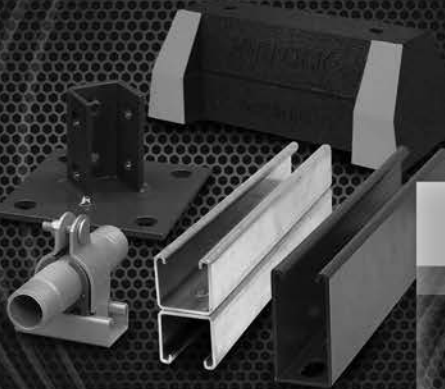
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BRANDS OF ANVIL INTERNATIONAL



Anvil product lines include malleable and cast iron fittings, unions and flanges; seamless and welded steel pipe nipples; steel pipe couplings; universal anvilets; forged steel fittings and unions; pipe hangers and supports; threaded rod; and engineered hangers



The SPF/Anvil product line includes a variety of internationally sourced products such as grooved couplings, fittings, cast iron, malleable iron and ductile iron threaded fittings, steel pipe nipples, as well as tee-lets.



The Grivlok product line consists of couplings for grooved and plain-end fittings, butterfly valves and check valves; flanges; pump protection components; pipe grooving tools; as well as copper and stainless steel system components.



We invented the concept of Flexible Fire Protection™. FlexHead systems connect sprinkler heads to sub-mains at least four times faster than hard pipe. Delivers even greater savings in retrofits. All our flexible sprinkler pipe and connections are UL Listed and FM Approved.



The Afcon seismic bracing line includes UL listed and FM approved structural attachments for concrete, wood or steel structural members like bar joist or I-beams, swivel connections that accept from 1" to 2" schedule 40 pipe. Afcon's seismic system attachments are engineered for up to 12" IPS steel pipe, copper tubing or plastic pipe.



Steel pipe nipples and steel pipe couplings are manufactured in accordance with the ASTM A733 Standard Specification for Welded and Seamless Carbon Steel and Stainless Steel Pipe Nipples. Steel pipe couplings are manufactured in accordance with the ASTM A865 Standard Specification for Threaded Couplings, Steel, Black or Zinc-Coated (Galvanized) Welded or Seamless, for Use in Steel Pipe Joints. API couplings are manufactured in accordance with the API Specification for line pipe.



Anvil-Strut products include a complete line of channel in stock lengths of 10 and 20 feet, with custom lengths available upon request. A variety of fittings and accessories are also offered. All products can be ordered in an assortment of finishes and material choices including SupR-Green™, Zinc Trivalent Chromium, pre-galvanized, hot-dipped galvanized, electro-galvanized, aluminum, plain, and stainless steel.



The Merit product line includes a variety of tee-lets and drop nipples for fire protection applications. Most Merit products are UL/ULC Listed, FM Approved, and rated from 175 to 300 psi.



JB Smith is the leading manufacturer of oil country tubular fittings, swages and bull plugs - all meeting API specifications. Offering tubing nipples, casing nipples as well as a full line of traditional line pipe and oil country threads in every schedule, JB Smith is the resource for all your oilfield needs.



Founded in 1983, NAP is a manufacturer of fabrication equipment, including automatic welders, plasma cut-off equipment, hole cutting equipment, make-on machines and pipe threaders. NAP, innovators of pipe fabrication equipment.



Catawissa hammer unions are offered in threaded ends and butt weld ends, and are interchangeable with most leading union manufacturers. Fully traceable and available with complete mill certifications, Catawissa's oilfield hammer union product line includes the standard ball-and-cone design plus our unique Figure 300 Flat Face design, where space and pipe line separation are a consideration.



Anvil EPS-Engineered Pipe Supports are products used to support piping systems under thermal, seismic, and other dynamic loading conditions. The product line encompasses variable spring hangers, constant supports, sway struts and snubbers as well as standard and special design clamps. Anvil EPS brings the highest quality products and innovative engineering solutions to common and uncommon piping system problems.