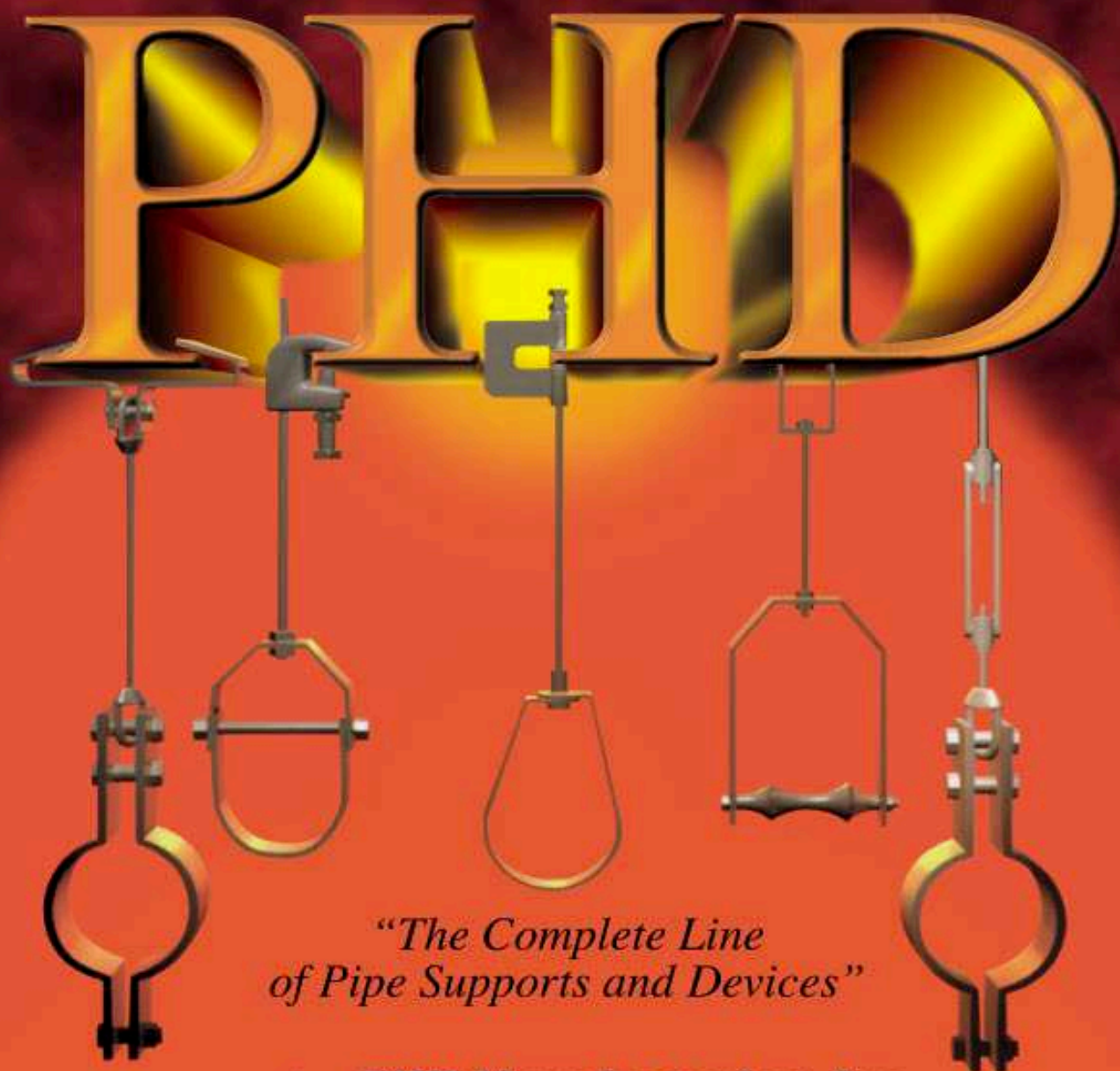


Pipe Hangers & Devices

Catalog No. 493



*"The Complete Line
of Pipe Supports and Devices"*



PHD Manufacturing, Inc.

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TERMS & CONDITION OF SALE

AGREEMENTS:

All agreements are subject to availability of material, strikes, accidents, or other causes beyond our control.

WARRANTY:

We warrant for one year from date of shipment our manufactured products to the extent that we will replace those having manufacturing defects when used for the purpose which we recommended. If goods are defective, the amount of damage is the price of the defective goods only and no allowance will be made for labor or expense of repairing defective goods or damage resulting from the same. We warrant the products we sell of other manufacturers to the extent of the warranties of their respective maker. This is the seller's sole warranty. Seller makes no other warranty of any kind, expressed or implied; and all implied warranties of merchantability and fitness for a particular purpose which exceed seller's afore stated obligation are hereby disclaimed by seller and excluded from this warranty.

For special order products made to the customer's specification, warranty is not valid and we are not responsible for load requirements or liable for damages incurred from product failure.

CLAIMS:

No claims for shortages allowed unless made in writing within ten days of receipt of goods. All goods sent out will be carefully examined, counted and packed. Claims for goods damaged or lost in transit should be made on the carrier, as our responsibility ceases on delivery to the carrier.

SPECIAL ORDERS:

Orders covering special or nonstandard goods are not subject to cancellation except on such terms as may be agreed upon.

TERMS AND DESIGN:

Subject to change without notice. Refer to current price list for terms of sale. PHD Manufacturing, Inc. reserves the right to revise product design without notification.

RETURNS:

We cannot accept return of any goods unless PHD Manufacturing, Inc.'s written permission has been first obtained, in which case same will be credited as follows:

- 1) All goods must be received in our plant in first class condition, if not, the cost of putting in salable condition will be deducted from credit.
- 2) Twenty-five percent (25%) will be deducted from credit memoranda issued for handling and restocking, less any charges allowed or paid by PHD Manufacturing, Inc.
- 3) Goods must be returned prepaid.
- 4) P.O.A. items cannot be returned.
- 5) There will be no returns of goods after one year from purchase date. Customer must provide invoice number.
- 6) There will be no return of goods under \$50.00, unless it is the result of PHD Manufacturing, Inc.'s error.

TAXES:

To the price and terms quoted, there will be added any manufacturer's or sales taxes payable on the transaction under any effective statute.

MINIMUM INVOICE:

\$50.00 plus transportation.

FREIGHT ALLOWANCE:

All prices are F.O.B. point of shipment. On shipments of 2500 lbs. or more, rail freight or motor freight at the lowest published price is allowed to all U.S. highway points listed in published tariffs (Hawaii and Alaska excluded).

TERMS:

Net 30 days. Monthly settlements on all accounts. One and-a-half percent (1½%) per month or eighteen percent (18%) per annum will be charged on all past due accounts, starting on the 31st day after the date of invoice.

DIMENSIONS & WEIGHTS:

Although PHD Manufacturing, Inc. tries to be as accurate as possible, all listed dimensions and weights are an approximation and are not guaranteed.

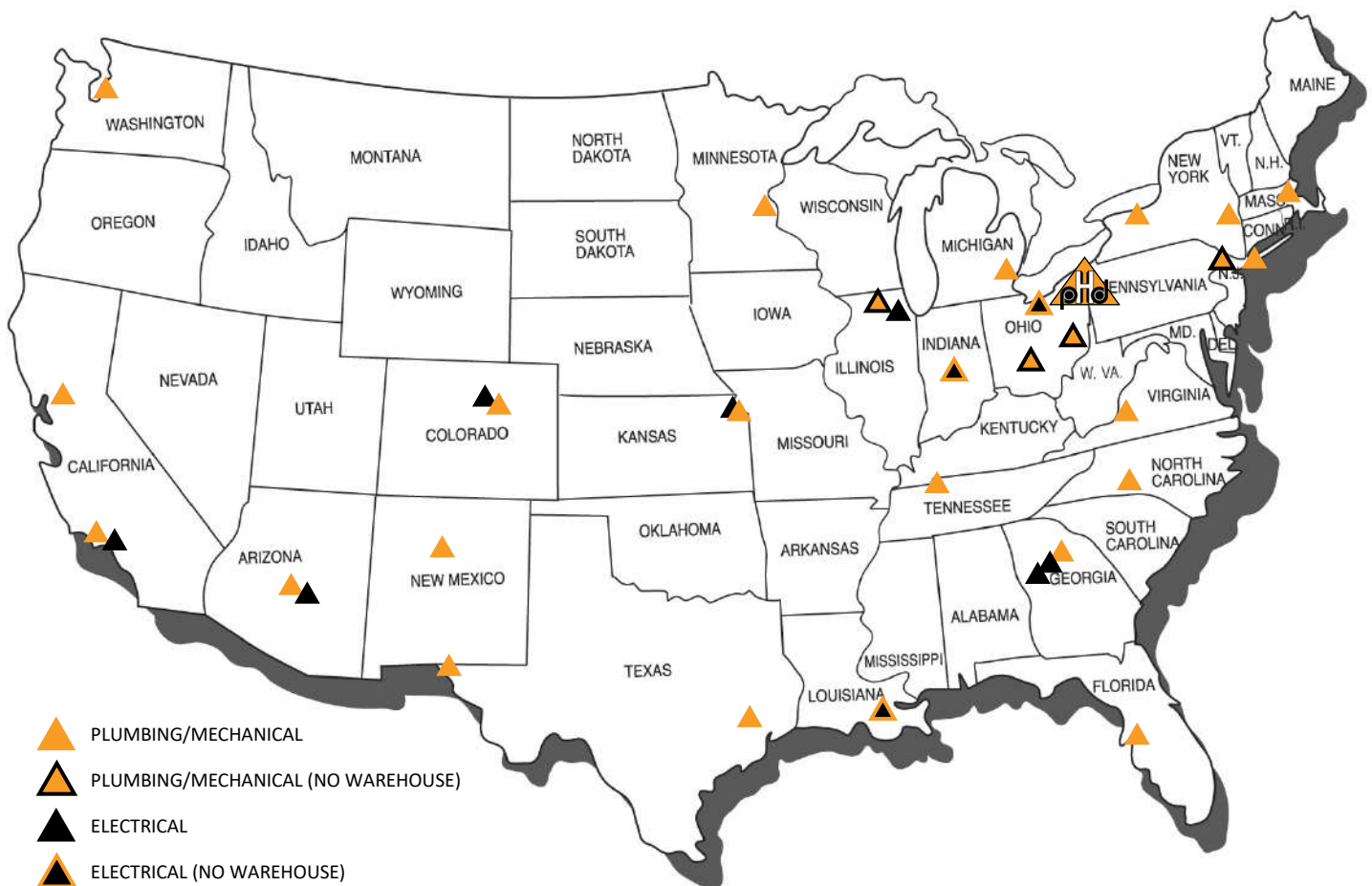
INTRODUCTION



PHD Manufacturing, Inc. was founded in 1972 by a group of industry veterans with strong management, financial, sales and manufacturing backgrounds. The entrepreneurial vision of this close group used the talents they acquired over the years to forge something special in a business that needed a different purpose. This core group continues to manage PHD Manufacturing, Inc. today, ensuring the original commitment to quality and excellence.

Our 30 professional sales representatives supporting the plumbing, mechanical and electrical industries are ready to serve your needs. Our manufacturing plant in Columbiana, Ohio, together with our 24 stocking warehouses throughout the United States, gives us one of the largest inventories in the industry.

Many of our products are Underwriter's Laboratories listed and Factory Mutual Approved. All PHD Manufacturing, Inc. products are manufactured to meet or exceed industry standards set for their design and manufacture. If you need a product not listed in this catalog, please call the factory or your local PHD Manufacturing, Inc. representative to check availability and pricing.



GENERAL SPECIFICATIONS

References:

- a. Federal, State, and Local codes.
- b. ANSI/MSS SP-58 - Manufacturers Standardization Society: Pipe Hangers and Supports - Materials, Design, and Manufacture.
- c. ANSI/MSS SP-69 - Manufacturers Standardization Society: Pipe Hangers and Supports – Selection and Application. ANSI/MSS SP-69 has been superseded by ANSI/MSS SP-58.
- d. NFPA 13 - Installation of Sprinkler Systems.
- e. ASTM - American Society for Testing and Materials.

Product Delivery, Handling, and Storage:

- a. All material is to be delivered in original factory packaging to avoid any damage to the product. (i.e. denting, scratching, bending)
- b. All PHD Manufacturing, Inc. products are to be stored in a sheltered area where they will be protected from the elements and construction equipment.
- c. Installation of damaged product is not recommended.

Acceptable Manufacturers:

- a. All hangers and supports to be installed shall be as manufactured by PHD Manufacturing, Inc. or engineer approved equal.

Quality Assurance:

- a. Many of our products are Underwriters Laboratories Listed, Factory Mutual Approved, comply with Federal Specification A-A-1192A and Manufacturer's Standardization Society ANSI/MSS SP-58 which supersedes ANSI/MSS SP-69.
- b. All PHD Manufacturing, Inc. products are produced to meet or exceed industry standards set for their design and manufacture.

Execution:

- Examination
 - a. The installer shall inspect the work area prior to installation. If work area conditions are unsatisfactory, installation shall not proceed until satisfactory corrections are completed.
- Installation
 - a. Installation shall be completed by a fully trained installer.
 - b. Set hangers and supports into final position in accordance with job specifications and shop drawings.
 - c. Anchor material firmly in place ensuring all connections are tightened appropriately.
- Protection
 - a. During installation, it is the installer's responsibility to protect this work from damage.
 - b. It shall become the responsibility of the end user to protect this work from damage during the remainder of construction on the project upon completion of work.
- Cleanup
 - a. Remove all protective wraps and debris upon completion of this section of work.
 - b. Repair any cosmetic damage due to installation.

Disclaimer:

- a. PHD Manufacturing, Inc. has little or no control over such factors as environmental conditions, total system design, product selection, and maintenance.
- b. The installer is responsible for the application to conform to all applicable codes, the integrity of attaching structure, and the use of proper fasteners.
- c. All load ratings are for static conditions and neglect dynamic loading of any kind.

PICTORIAL INDEX

THREADED ACCESSORIES



FIG. 10
THREADED STUD
PAGE 20



FIG. 15
MACHINE THREAD
ROD
PAGE 20



FIG. 20 & 21
CONTINUOUS
THREADED ROD
PAGE 20



FIG. 020
ROD SWIVEL
ATTACHMENT
PAGE 21

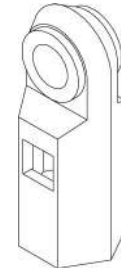


FIG. 25
EXTENSION PIECE
PAGE 21

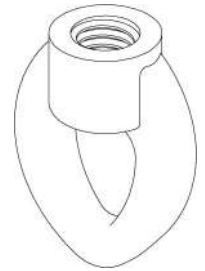


FIG. 30
EYE SOCKET
PAGE 22

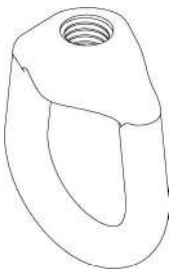


FIG. 35 & 35L
WELDLESS EYE NUT
PAGE 22



FIG. 36
STEEL EYE SOCKET
PAGE 23

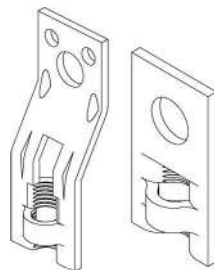


FIG. 37
STEEL EYE SOCKET
PAGE 23



FIG. 38 & 38L
FORGED STEEL
CLEVIS
PAGE 24



FIG. 40
COACH SCREW ROD
PAGE 25

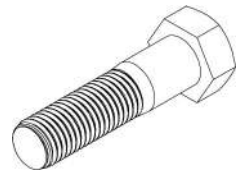


FIG. 41
HEX HEAD BOLD
PAGE 25

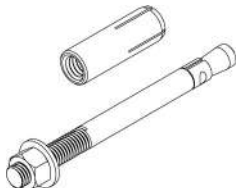


FIG. 47
CONCRETE
ANCHORS
PAGE 26



FIG. 48
WOOD DRIVE
SCREW
PAGE 26



FIG. 50 - 55L
EYE ROD
PAGE 27

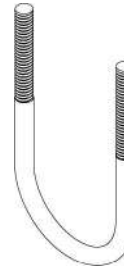


FIG. 90 - 95
U-BOLT
PAGE 28-29

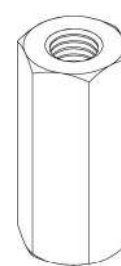


FIG. 100, 104, & 105
ROD COUPLINGS
PAGE 29-30



FIG. 110 & 110H
HEX NUT
PAGE 30

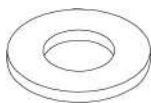


FIG. 130
FLAT WASHER
PAGE 30

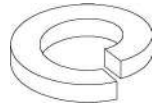


FIG. 134
LOCK WASHER
PAGE 30

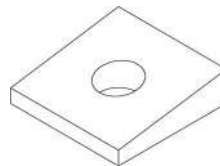


FIG. 135
BEVEL WASHER
PAGE 31

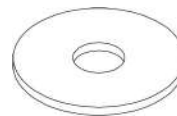


FIG. 136
FENDER WASHER
PAGE 31



FIG. 960
TURNBUCKLE
PAGE 31

PICTORIAL INDEX

CPVC STRAPS

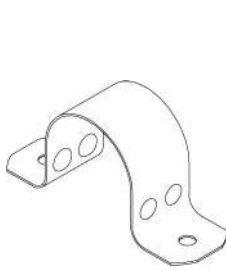


FIG. 070
CPVC TWO-HOLE
PIPE STRAP
PAGE 32



FIG. 075
CPVC ONE-HOLE
WRAP AROUND
PAGE 32

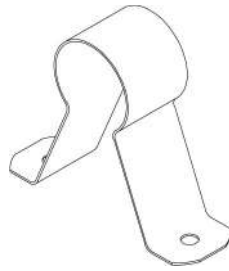


FIG. 076
CPVC TWO-HOLE
STAND OFF STRAP
PAGE 33

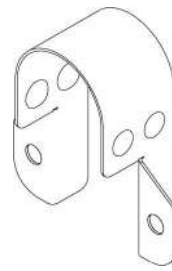


FIG. 077
CPVC TWO-HOLE
SIDE MOUNT STRAP
PAGE 33

BAND HANGERS



FIG. 141
NFPA SWIVEL
RING HANGER
PAGE 35

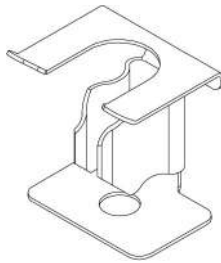


FIG. 055
SERGE RESTRAINT
PAGE 35



FIG. 143
PVC SWIVEL
RING HANGER
PAGE 36



FIG. 151
SWIVEL
RING HANGER
PAGE 37



FIG. 152 & 154
COPPER TUBING
HANGER
PAGE 37

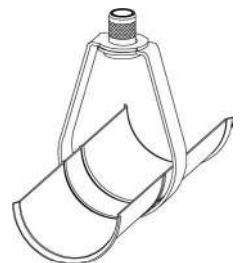


FIG. 145 & 155
RING HANGER
WITH SHIELD
PAGE 38

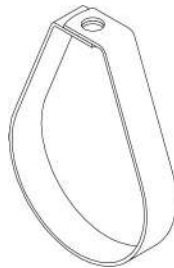


FIG. 180 - 182
BAND HANGER
PAGE 38-39



FIG. TRH 2 - TRH 5
TRH HANGING
SYSTEM
PAGE 39

PICTORIAL INDEX

BEAM CLAMPS

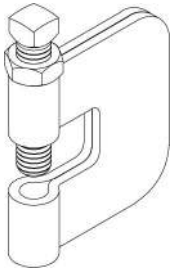


FIG. 250
STEEL C-CLAMP
PAGE 40

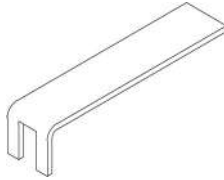


FIG. 259
C-CLAMP
RETAINING STRAP
PAGE 40

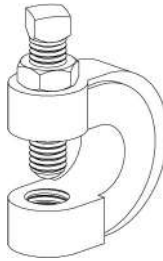


FIG. 270
MALLEABLE IRON
C-CLAMP
PAGE 41

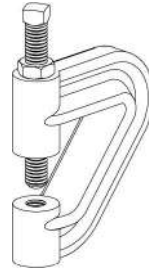


FIG. 290
PURLIN CLAMP
PAGE 41

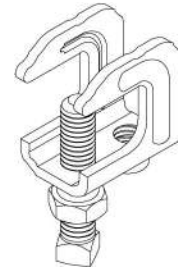


FIG. 345
STAMPED STEEL
TOP BEAM CLAMP
PAGE 42



FIG. 350
IMPORT BEAM
CLAMP
PAGE 43

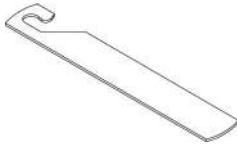


FIG. 358
RETROFIT
RETAINING STRAP
PAGE 42

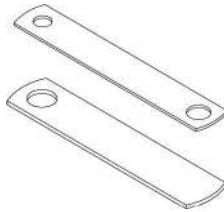


FIG. 359
BEAM CLAMP
RETAINING STRAP
PAGE 43

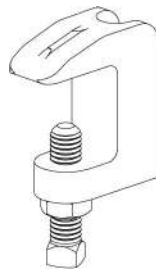


FIG. 360
IMPORT WIDE
MOUTH BEAM
CLAMP
PAGE 44



FIG. 350 - 357
DOMESTIC BEAM
CLAMP
PAGE 45



FIG. 363 & 364
DOMESTIC WIDE
MOUTH BEAM
CLAMP
PAGE 46

CLEVIS HANGERS

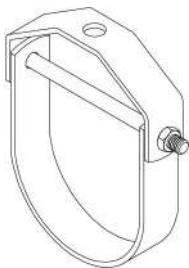


FIG. 420
A.W.W.A. CLEVIS
PAGE 47

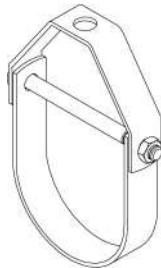


FIG. 425 & 426
STAINLESS STEEL
CLEVIS
PAGE 48



FIG. 430
INSULATED PIPE
CLEVIS
PAGE 49

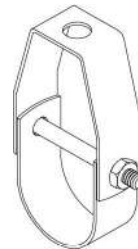


FIG. 440 - 441
LIGHT DUTY
CLEVIS
PAGE 50

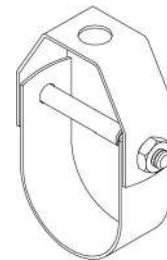


FIG. 442
COPPER TUBING
CLEVIS
PAGE 51

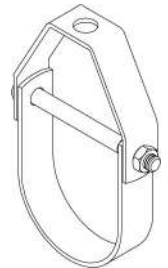


FIG. 450 - 454
STANDARD CLEVIS
PAGE 52

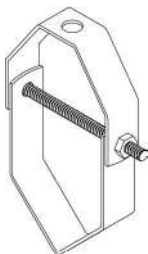


FIG. 450V
V-BOTTOM CLEVIS
PAGE 53



FIG. 450T
V-BOTTOM CLEVIS
SUPPORT TROUGH
PAGE 53

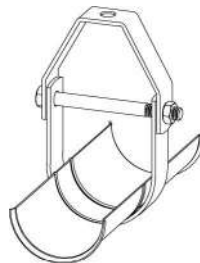


FIG. 455 - 456
CLEVIS WITH
SECURED SHIELD
PAGE 54

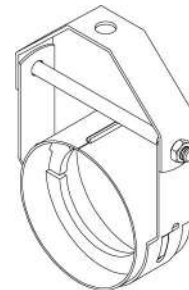


FIG. 703025-708362
CLEVIS SERIES KLO-
SHURE HANGER
PAGE 55



FIG. 970 - 973
J-HANGER
PAGE 56

PICTORIAL INDEX

PIPE ROLLER SUPPORTS

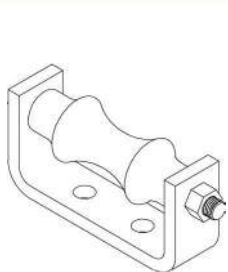


FIG. 460
PIPE ROLLER CHAIR
PAGE 57



FIG. 470 & 475
PIPE ROLLER
HANGER
PAGE 58



FIG. 480 & 480D
ADJUSTABLE PIPE
ROLLER SUPPORT
PAGE 59

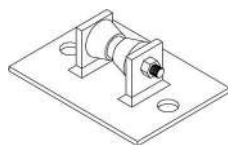


FIG. 486
PIPE ROLLER
STAND
PAGE 60

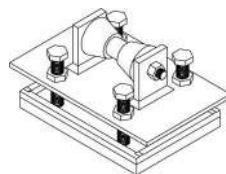


FIG. 487
ADJUSTABLE PIPE
ROLLER STAND
WITH BASE
PAGE 61

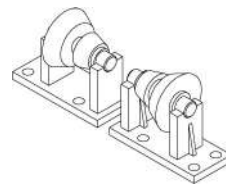


FIG. 488
FABRICATED
ROLLER FOR
LARGE PIPING
PAGE 62

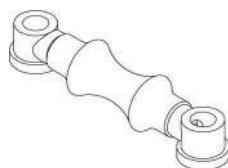


FIG. 490
PIPE ROLLER
WITH SOCKETS
PAGE 63

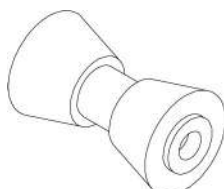


FIG. 485
SHORT PIPE ROLLER
PAGE 64

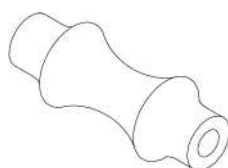


FIG. 495
LONG PIPE ROLLER
PAGE 65



FIG. 496
ROLLER SOCKET
PAGE 65

SPLIT RING HANGERS

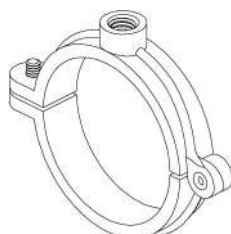


FIG. 508R
HINGED EXTENSION
SPLIT CLAMP
PAGE 67



FIG. 510R
EXTENSION
SPLIT CLAMP
PAGE 67

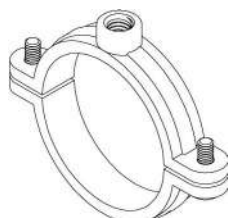


FIG. 512
COPPER TUBING
EXTENSION SPLIT
CLAMP
PAGE 68



FIG. 512H
HINGED COPPER
TUBING EXTENSION
SPLIT CLAMP
PAGE 68

PICTORIAL INDEX

PIPE CLAMPS

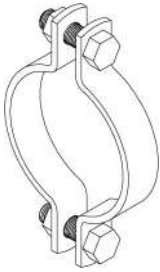


FIG. 520 & 521
STANDARD
PIPE CLAMP
PAGE 69

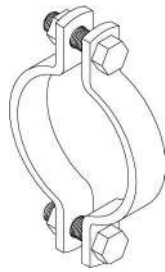


FIG. 522
HEAVY DUTY
PIPE CLAMP
PAGE 70

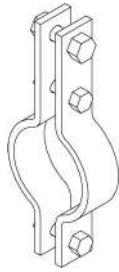


FIG. 525
DOUBLE BOLT
PIPE CLAMP
PAGE 71

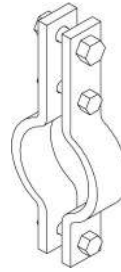


FIG. 526
HEAVY DUTY
DOUBLE BOLT
PIPE CLAMP
PAGE 72

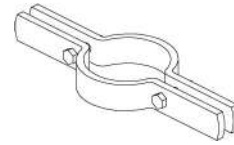


FIG. 550, 551 & 553
RISER CLAMP
PAGE 73

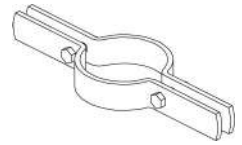


FIG. 552 & 554
COPPER TUBING
RISER CLAMP
PAGE 74

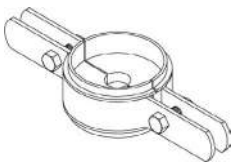


FIG. R087100-R412150
INSULATION
RISER CLAMP
PAGE 75

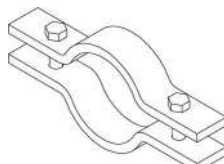


FIG. 580
TWO BOLT
UNDERGROUND
PIPE CLAMP
PAGE 76

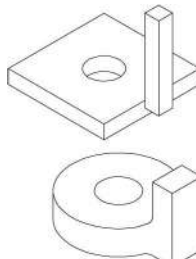


FIG. 585
WASHER FOR
FIG. 580
PAGE 76

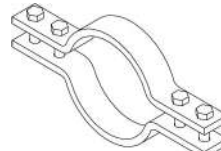


FIG. 590
FOUR BOLT
UNDERGROUND
PIPE CLAMP
PAGE 77

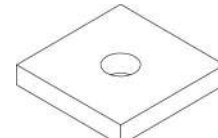


FIG. 595
WASHER FOR
FIG. 590
PAGE 77

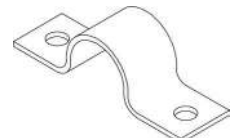


FIG. 825 & 826
TWO HOLE STRAP
PAGE 78



FIG. 830
SHORT PIPE STRAP
PAGE 78



FIG. 835-837
ONE HOLE STRAP
PAGE 79

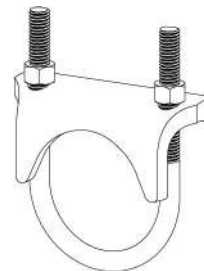


FIG. 840
RIGHT ANGLE
CLAMP
PAGE 79

CENTER LOAD CLAMPS

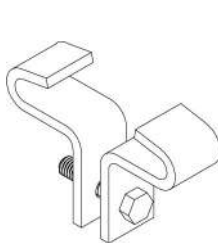


FIG. 610 & 620
STEEL CENTER
LOAD BEAM
CLAMP
PAGE 80

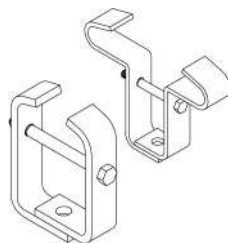


FIG. 625
STEEL CENTER
LOAD BEAM
CLAMP
PAGE 81

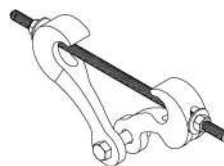


FIG. 630
MALLEABLE
CENTER LOAD
BEAM CLAMP
PAGE 81

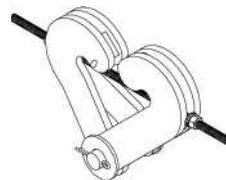


FIG. 632 - 633
STEEL CENTER
LOAD BEAM
CLAMP
PAGE 82

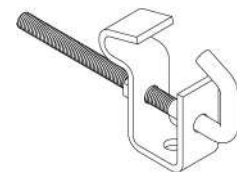


FIG. 635
ADJUSTABLE STEEL
BEAM CLAMP
PAGE 83

PICTORIAL INDEX

SHIELDS, INSULATION, & PIPE SADDLES

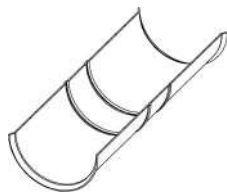


FIG. 160
SELF CENTERING
INSULATION
SHIELD
PAGE 84



FIG. 165-166
SELF-LOCKING
PIPE & TUBE
INSULATION
PAGE 87

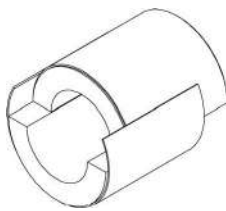


FIG. 167-168
NON-LOCKING
PIPE & TUBE
INSULATION
PAGE 88



FIG. 170
INSULATION
SHIELD
PAGE 85

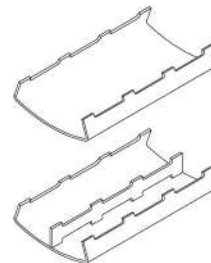


FIG. 651 & 658
PIPE SADDLE
PAGE 89 - 91

PIPE GUIDES & SLIDES

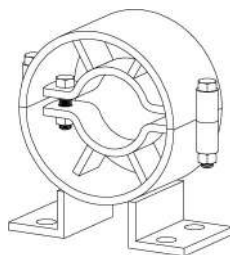


FIG. 670 - 678
PIPE ALIGNMENT
GUIDE
PAGE 92

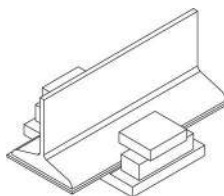


FIG. 690
PIPE SLIDE
PAGE 94-95

WALL BRACKETS

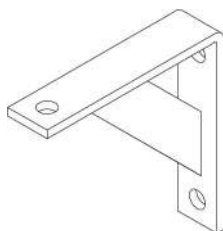


FIG. 850
LIGHT DUTY
WALL BRACKET
PAGE 96

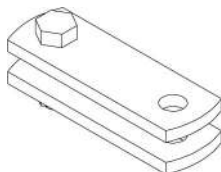


FIG. 850C
CLIP FOR FIG. 850
WALL BRACKET
PAGE 96

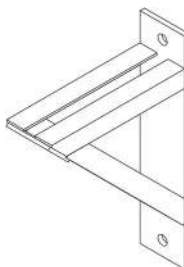


FIG. 855
MEDIUM DUTY
WALL BRACKET
PAGE 97

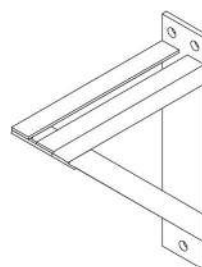


FIG. 860
HEAVY DUTY
WALL BRACKET
PAGE 97

PICTORIAL INDEX

PIPE SUPPORTS



FIG. 870
PIPE SADDLE
SUPPORT WITH
COUPLING
PAGE 98

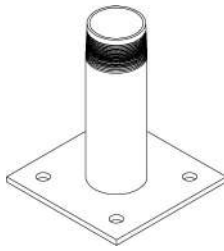


FIG. 871
THREADED BASE
STAND
PAGE 98

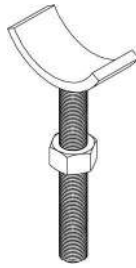


FIG. 874
PIPE SADDLE SUP-
PORT WITH STUD
PAGE 99



FIG. 875
ADJUSTABLE PIPE
SADDLE SUPPORT
PAGE 99



FIG. 876
ADJUSTABLE PIPE
SADDLE SUPPORT
WITH U-BOLT
PAGE 100

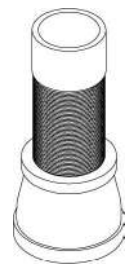


FIG. 877
PIPE SUPPORT
ADJUSTER
PAGE 100

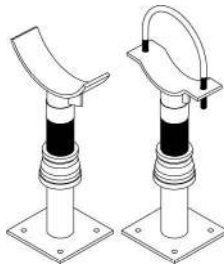


FIG. 878 & 879
PIPE SUPPORT
ADJUSTER
PAGE 101

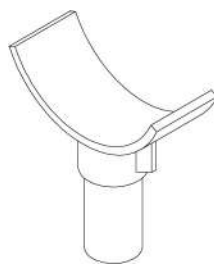


FIG. 880
PIPE SADDLE
SUPPORT
PAGE 102



FIG. 882
PIPE SADDLE
SUPPORT WITH
U-BOLT
PAGE 103

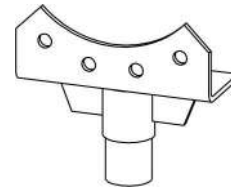


FIG. 883
PIPE FLANGE
SUPPORT
PAGE 104

STRUCTURAL ATTACHMENTS



FIG. 885
ADJUSTABLE
Q-DECK INSERT
PAGE 105

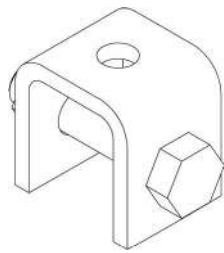


FIG. 900 & 900-1
WELDED BEAM
ATTACHMENT
PAGE 106

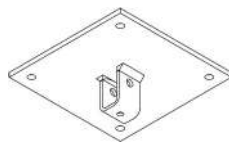


FIG. 903
CONCRETE ROD
ATTACHMENT PLATE
PAGE 107

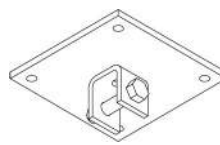


FIG. 904
CONCRETE
CLEVIS PLATE
PAGE 108



FIG. 905
SIDE BEAM
CONNECTOR
PAGE 109

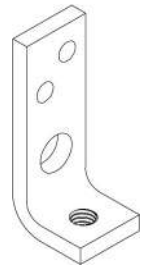


FIG. 906
STEEL SIDE BEAM
CONNECTOR
PAGE 109

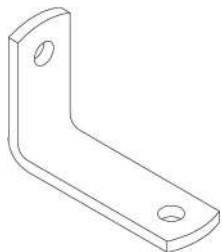


FIG. 910
REVERSIBLE
ANGLE BRACKET
PAGE 109



FIG. 920
SIDE BEAM
ANGLE BRACKET
PAGE 110

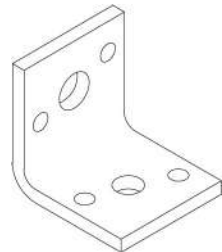


FIG. 925
REVERSIBLE SIDE
BEAM ANGLE
BRACKET
PAGE 110

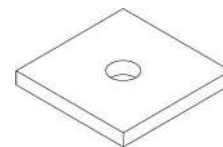


FIG. 930
SQUARE PLATE
WASHER
PAGE 111

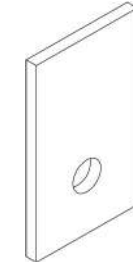


FIG. 935 & 936
WELDING LUG
PAGE 111

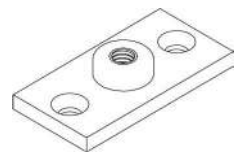


FIG. 940 - 942
CEILING FLANGE
PAGE 112

PICTORIAL INDEX

STRUCTURAL ATTACHMENTS (CONT'D)

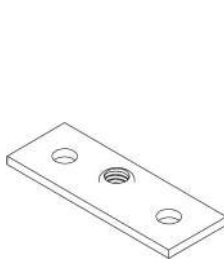


FIG. 945 & 946
STEEL CEILING
PLATE
PAGE 112

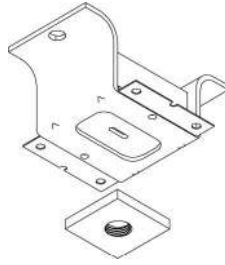


FIG. 950 - 951N
CONCRETE INSERT
PAGE 113

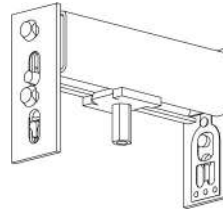


FIG. 990
ADJUSTABLE
IN-RACK FLUE
HANGER
PAGE. 114

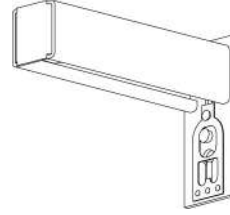


FIG. 995
SINGLE IN-RACK
FLUE HANGER
PAGE. 114

SEISMIC

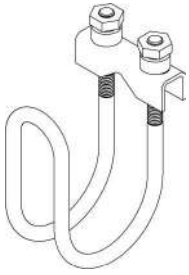


FIG. 010
SWAY BRACE PIPE
ATTACHMENT
PAGE 115

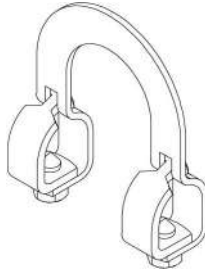


FIG. 015
LARGE SWAY
BRACE PIPE
ATTACHMENT
PAGE 116

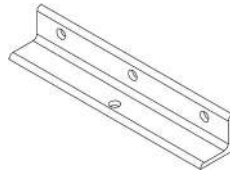


FIG. 025
MULTI-FASTENER
ADAPTER
PAGE 117

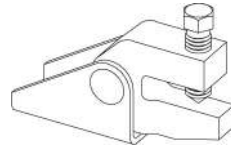


FIG. 030
C-CLAMP
STRUCTURAL
ATTACHMENT
PAGE 118



FIG. 031
CLAMPING PIPE
ATTACHMENT
PAGE 119

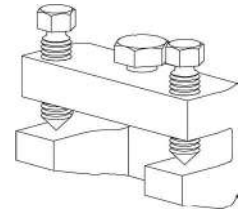


FIG. 035
SWAY BRACE
BAR JOIST
ADAPTER
PAGE 120

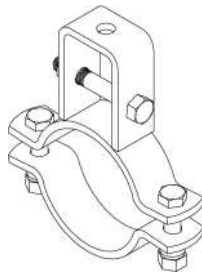


FIG. 040
SUPPORTING PIPE
ATTACHMENT
PAGE 121

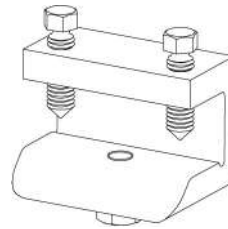


FIG. 045
SWAY BRACE
STRUCTURAL
ADAPTER
PAGE 122

PIPE HANGERS & DEVICES

Cast Iron:

-Grey Cast Iron, ANSI/ASTM A48, Class #20

Malleable Iron:

-ANSI/ASTM A47, Grade Number 32510

Ductile Iron:

-ASTM A536 Grade 65-45-12

Forged Steel:

-ASTM A668 or A1030

Spring Steel:

-SAE 1066-65Mn

Carbon Steel: (3 Gauge Thickness and Below)

-ASTM A1011 CS Type A, B, or C

Carbon Steel: ($\frac{1}{4}$ " Thickness and Above)

-ASTM A36, Structural Quality

Pre-Galvanized Steel:

-ASTM A653, Grade 33 Steel Sheet Coated by Hot Dip Process

Stainless Steel:

-ASTM A240, Type 304

-ASTM A240, Type 316

ALUMINUM

The high strength to weight ratio of PHD Manufacturing, Inc. products made of aluminum greatly reduces the overall cost of installation through ease of handling and field cutting.

Aluminum owes its excellent corrosion resistance to its ability to form an aluminum oxide film that immediately reforms when scratched or cut. In most outdoor applications, aluminum has excellent resistance to "weathering". The resistance to chemicals, indoor or outdoor, can best be determined by tests conducted by the user with exposure to the specific conditions for which it is intended.

To determine the approximate load data for strut, multiply the load data found in this catalog by a factor of 0.38.

CARBON STEEL

PHD Manufacturing, Inc. products made from high-quality carbon steel are cold formed to precise dimensions. By cold working the steel mechanical properties are increased, allowing lightweight structures to carry the required load. Corrosion resistance of carbon steel varies widely with coating and alloy. See "Finishes" for more detailed information.

STAINLESS STEEL

Because of its corrosion resistance, stainless steel is recommended for applications where corrosion is a problem. Load data for PHD Manufacturing, Inc. stainless steel products is the same as the load data in this catalog.

Stainless steel products are available in ASTM A-240, Type 304 or 316 material. Both are low-magnetic and belong to the austenitic stainless steels group, based on alloy content and crystallographic structure. Like carbon steel, stainless steel exhibits increased strength when cold worked.

Several conditions make the use of stainless steel ideal. These include reducing long term maintenance costs, high ambient temperatures, appearance, and stable structural properties such as yield strength, and high creep strength.

Type 304 resists most organic chemicals, dyestuffs and a wide variety of inorganic chemicals at elevated or cryogenic temperatures. Type 316 contains slightly more nickel and adds molybdenum to give it better corrosion resistance in chloride and sulfuric acid environments.

FINISHES & CORROSION

PLAIN (PL)

Plain finish designation means that the product retains the oiled surface applied to the raw steel during the forming process. The fittings have the original oiled surface of the bar-stock material.

PVC COATING (PVC)

PVC coating helps reduce noise and protect the pipe or tubing from the metal surface of the hanger. Corrosion resistance protection is minimal. PVC coating is not compatible with CPVC pipe.

COPPER COLOR EPOXY FINISH (CCFEF)

Designed for use with copper tubing. This coating provides a better level of corrosion resistance than the traditional copper plated finish. It also acts as a protective barrier, avoiding contact between dissimilar metals. The copper color epoxy powder is applied by an electrostatic method, and the coated parts are baked at 180 degrees for 20 minutes.

POWDER COATING (PTD)

PHD Manufacturing, Inc. offers a polyester powder coating that utilizes powder material conforming to ASTM D3451. It is applied by means of an electrostatic spray at ambient temperature.

CHANNEL GREEN: POLYESTER

POWDER PROPERTIES

Test Method	Powder Properties	Tolerances
ASTM D3451 (18.30)	Specific Gravity	1.33 ± 0.03
ASTM D3451 (18.30)	Theoretical Coverage	144.58 ± 4.0 FT ² /Lb./Mil.
ASTM D3451 (13)	Volatile Content	Max. 2.5%
ASTM D3451 (13)	Storage Temperature Max	80°F

COATING PROPERTIES

All tests performed on substrate 0.032 CRS Pretreatment Bonderite 1000

Test Method	Coating Properties	Tolerances/Specifications
ASTM D523	Gloss 20°/60°	70-80
ASTM D2454	Over Bake Resistance Time	100%
ASTM D3363	Pencil Hardness	H - 2H
ASTM D2794 (Modified)	Direct Impact (Gardner)	80 in. Lbs.
ASTM D2794 (Modified)	Reverse Impact (Gardner)	80 in. Lbs.
ASTM D3359	Adhesion (Cross Hatch)	Pass No Adhesion Loss
ASTM D522	Flexibility (Mandrel)	1/8 Bend No Fracture
ASTM B117	Salt Spray	1000 Hrs.
ASTM D2247	Humidity	500 Hrs.

APPLICATION

Test Method	Application	Cure Schedule
Electrostatic Spray	Ambient Temperature	15' @ 375°F (190°C) Recommended Minimum Film Thickness 1.5

EPOXY E-COAT

PHD Manufacturing's epoxy E-Coat offers state of the art corrosion resistance without the use of heavy metals such as lead, chrome, and zinc. It is applied to our products by a controlled cathodic electro-deposition process. This process is accomplished by transporting the product through several cleaning, phosphatizing, rinsing, and application stages prior to being baked for 20 minutes at 375°F (190°C).

EPOXY PROPERTIES

Property	Test Method	Performance
Color	---	Various
Film Thickness	---	0.5 - 1.5 Mils
Gloss - 60 Degree	ASTM D523	65 - 85
Pencil Hardness	ASTM D3363	2H Minimum
Direct Impact	ASTM D2794	120 in-lb. Minimum
Reverse Impact	ASTM D2794	100 in-lb. Minimum
Cross-Hatch Adhesion	ASTM D3359	4B - 5B
Humidity	ASTM D1735	1000 Hours Minimum
Water Immersion	ASTM D870	250 Hours Minimum
Gravelometer	GM 9508P	6 Minimum
Throwpower	GM 9535P	12 - 15 Inches

All tests performed on Cold Rolled Steel Lab Panels, Zinc Phosphate Pretreatment, 0.6 Mil Average Film Thickness, Cure 20 Minutes @ 375°F

Property	Substrate / Pretreatment	Salt Spray* 500 hrs.	Salt Spray* 1000 hrs.	20 Cycle** Scab
Corrosion Resistance	CRS/Zinc Phos/Non-Chrome	0 in. (0 mm)	0 - 0.039 in. (0 - 1 mm)	0.039 - 0.079 in. (1 - 2 mm)

(Average Total Scribe Creep), * Salt Spray - ASTM B117

** Cycle Scab - GM9511P, Cold Rolled Steel Lab Panels

Cure 20 Minutes @ 375°F (190°C)

ZINC COATING

PHD offers 3 basic forms of zinc coating on its products:

- 1) **Electro-Galvanized** (Electro-Plated Zinc)
- 2) **Pre-Galvanized**
- 3) **Hot Dipped Galvanized**

For best results, a zinc rich paint should be applied to field cuts. The zinc rich paint will provide immediate protection for these areas and eliminate the short time period for galvanic action to “heal” the damaged coating.

Note: The corrosion resistance of zinc is based on its thickness, the environment, and the coating process used. The acceptability of galvanized coatings at temperatures above 450°F is at the discretion of the end user.

Zinc offers two types of protection:

- **Barrier:** The zinc coating protects the steel substrate from direct contact with the environment
- **Sacrificial:** The zinc coating will protect scratches, cut edges, etc... through an anodic sacrificial process.

ELECTRO-GALVANIZED “EG” (ASTM B633 SC1 & SC3)

This type of coating is recommended for use indoors in relatively dry areas. The steel is submersed 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 0.5 mils of zinc per side can be applied using this method.

SC1 (Mild) is the standard finish thickness which has a zinc coating of 0.2 mils per side. SC3 (Severe) has a zinc coating of 0.5 mils per side.

PRE-GALVANIZED “PG” (ASTM A653 COATING G90)

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. Zinc near the uncoated edges or weld areas becomes a sacrificial anode which protects the bare areas.

The pre-galvanized material conforms to ASTM A653 with a G90 zinc coating. The zinc thickness per side is nominally 0.75 mils thick or 0.45 oz./sq. ft.

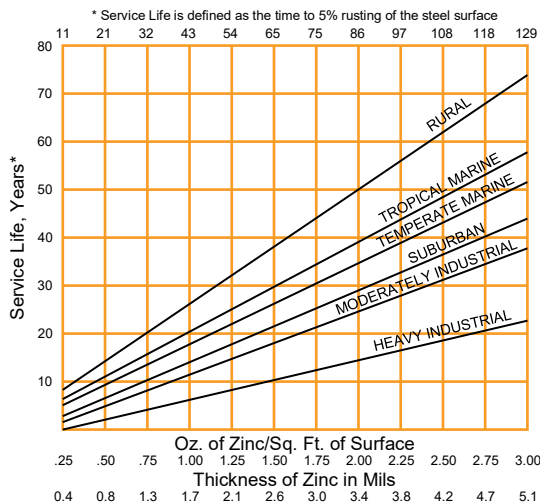
HOT-DIP GALVANIZED “HDG” (ASTM 123)

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. Please note that some items cannot be hot-dipped galvanized due to design, tolerances, or threaded components. Check with the PHD factory or your local representative when questionable. Threaded components on hot dipped galvanized products will be electro-galvanized.

The hot-dip galvanized coating is typically 2.6 mils or 1.5 oz./sq. ft per side.

As shown in the graph, when the zinc coating is double, the service life is double under most conditions.

Life of Protection vs. Thickness of Zinc
And Type of Atmosphere



Comparison of Zinc Finishing	
Finish	Zinc Thickness (mils)
Hot-Dip Galvanized	2.6
Pre-Galvanized	0.75
Electro-Galvanized (SC1)	0.2
Electro-Galvanized (SC3)	0.5

CORROSION

All metal surfaces are affected by corrosion. Depending on the physical properties of the metal and the environment to which it is exposed, chemical or electromechanical corrosion may occur.

Atmospheric Corrosion

Atmospheric corrosion occurs when metal is exposed to airborne liquids, solids or gases. Some sources of atmospheric corrosion are moisture, salt, dirt and sulphuric acid. This form of corrosion is typically more severe outdoors, especially near marine environments.

Chemical Corrosion

Chemical corrosion takes place when metal comes in direct contact with a corrosive solution. Some factors which affect the severity of chemical corrosion include: chemical concentration level, duration of contact, frequency of washing, and operating temperature.

Galvanic Corrosion

Galvanic corrosion occurs when two or more dissimilar metals are in contact in the presence of an electrolyte (i.e. moisture). An electrolytic cell is created and the metals form an anode or a cathode depending on their relative position on the Galvanic Series Table. The anodic material will be the one to corrode. Anodic or cathodic characteristics of two dissimilar metals will depend on the type of each material. For example: If zinc and steel are in contact, the zinc acts as the anode and will corrode; the steel acts as the cathode, and will be protected. If steel and copper are in contact, the steel is now the anode and will corrode. The rate at which galvanic corrosion occurs depends on several factors:

1. The relative position on the Galvanic Series Table - the further apart materials are in the Galvanic Series Table, the greater the potential for corrosion of the anodic material.
2. The amount and concentration of electrolyte present - an indoor, dry environment will have little or no galvanic corrosion compared to a wet atmosphere.
3. The relative size of the materials – a small amount of anodic material in contact with a large cathodic material will result in greater corrosion. Likewise, a large anode in contact with a small cathode will decrease the rate of attack.

Storage Corrosion

Wet storage stain (white rust) is caused by the entrapment of moisture between surfaces of closely packed and poorly ventilated material for an extended period. Wet storage stain is usually superficial, having no affect on the properties of the metal.

Light staining normally disappears with weathering. Medium to heavy buildup should be removed in order to allow the formation of normal protective film. Proper handling and storage will help to assure stain-free material. If product arrives wet, it should be unpacked and dried before storage. Dry material should be stored in a well ventilated "low moisture" environment to avoid condensation formation. Outdoor storage is undesirable, and should be avoided whenever possible.

GALVANIC SERIES IN SEA WATER

Anodic End

Magnesium
Magnesium Alloys
Zinc (Galvanized Coating)
Beryllium
Aluminum - Zinc Alloys
Aluminum - Magnesium Alloys
Aluminum
Aluminum - Magnesium Alloys
Aluminum - Magnesium - Silicon Alloys
Cadmium
Aluminum - Copper Alloys
Low Carbon Steel, Cast Iron, Wrought Iron
Austenitic Nickel Cast Iron
Type 410 Stainless Steel (active)
Type 316 Stainless Steel (active)
Type 304 Stainless Steel (active)
Naval Brass, Yellow Brass, Red Brass
Tin
Copper
Lead-Tin Solders
Admiralty Brass, Aluminum Brass
Manganese Bronze
Silicon Bronze
Tin Bronze
Type 410 Stainless Steel (passive)
Nickel - Silver
Copper Nickel Alloys
Lead
Nickel - Aluminum Bronze
Silver Solder
Nickel 200
Silver
Type 316 Stainless Steel (passive)
Type 304 Stainless Steel (passive)
Incoloy 825
Hastelloy B
Titanium
Hastelloy C
Platinum
Graphite



More Anodic

Cathodic End

Metals in descending order of activity in the presence of an electrolyte.

CORROSION

The corrosion data given in this table is for general comparison only.

The presence of contaminants and the effect of temperature in chemical environments can greatly affect the corrosion of any material.

PHD Manufacturing, Inc. strongly suggests that field service tests or simulated laboratory tests using actual environmental conditions are conducted in order to determine the proper materials and finishes to be selected.

Chemical	Aluminum	Channel Green	Type 304 Stainless	Type 316 Stainless	Zinc Coated Steel
Acetic Acid 10%	R	NR	R	R	NR
Acetic Acid 2%	R	F	R	R	NR
Acetone	R	R	R	R	R
Ammonium Hydroxide-Conc.	R	R	R	R	-
Ammonium Hydroxide 10%	F	R	R	R	-
Ammonium Hydroxide 2%	R	R	R	R	-
Benzene	R	R	R	R	-
Bromine Water	NR	R	NR	NR	-
Butanol (Butyl Alcohol)	R	R	R	R	R
Carbon Disulfide	R	R	R	R	-
Carbon Tetrachloride	F	R	R	R	-
Chlorine Water	R	R	NR	F	R
Cutting Oil	-	R	-	-	-
Diethanolamine	R	R	-	-	NR
Ethanol	R	R	R	R	R
Ethyl Acetate	R	R	-	-	R
Ethylene Dichloride	F	R	-	-	R
Formaldehyde 20%	R	R	R	R	R
Gasoline	R	R	R	R	R
Glycerine	R	R	R	R	R
Household Detergent 10%	F	R	R	R	-
Hydrochloric Acid 40%	NR	NR	NR	NR	NR
Hydrochloric Acid 10%	NR	F	NR	NR	NR
Hydrochloric Acid 2%	NR	F	NR	NR	NR
Hydrogen Peroxide 30%	R	NR	R	R	-
Hydrogen Peroxide 3%	R	R	R	R	-
Hydrogen Sulfide (Gas)	R	R	F	R	-
JP-4 Jet Fuel	R	R	R	R	-
Lactic Acid 85%	F	R	NR	-	-
Latex	R	R	R	R	NR
Linseed Oil Fatty Acid	R	F	R	R	-
Methanol	R	R	R	R	R
Methyl Ethyl Ketone	R	R	-	-	R
Methyl Isobutyl Ketone	R	R	-	-	R
Mineral Spirits	R	R	-	-	-
Motor Oil - 10W	R	R	R	R	R
Naphtha, VM&P	R	R	R	R	R
Nitric Acid 2%	F	NR	R	R	-
Perchloroethylene	R	R	-	-	NR
Petroleum Ether	-	R	R	R	R
Phenol 10%	R	R	R	R	R
Phosphoric Acid 2%	F	NR	R	R	NR
Potassium Hydroxide 50%	NR	R	R	R	-
Potassium Hydroxide 10%	NR	R	R	R	-
Potassium Hydroxide 2%	NR	R	R	R	-
Sodium Chloride 25%	F	R	R	R	F
Sodium Hydroxide 50%	NR	R	R	R	NR
Sodium Hydroxide 10%	NR	R	R	R	F
Sodium Hydroxide 2%	NR	R	-	-	-
Sodium Hypochlorite-C1. 10%	F	R	-	-	-
Sodium Hypochlorite-C1. 6%	F	R	NR	R	-
Sulfuric Acid 50%	F	NR	NR	R	NR
Tall Oil Fatty Acid 50%	R	R	-	-	-
Tannic Acid 50%	F	R	R	R	-
Water-Deionized	R	R	R	R	F
Water-Sea	F	F	R	R	F
Water-Tap	R	R	F	F	R
Xyol	R	R	-	-	-

R = Recommended

F = May be used under some conditions

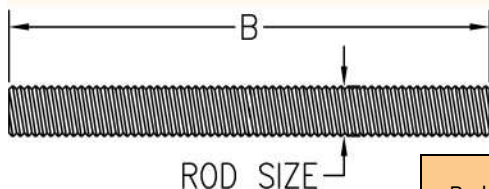
NR = Not Recommended

- = Information not available

THREADED ACCESSORIES

FIG. 10

THREADED STUDS

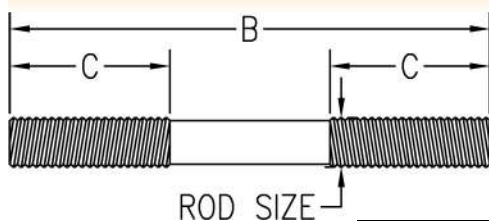


Function: Designed for use in pipe hanger assemblies.
Material: Carbon steel (Type 304 or 316 Stainless Steel upon request)
Finish: Plain or electro-galvanized (Hot dipped galvanized upon request)
Ordering: Specify figure number, rod size, length (B), material, and finish.

Rod Size	Max. Rec. Load				Wt. Per Inch	
	650°F (343°C)		750°F (399°C)			
	lbs.	kN	lbs.	kN	lbs.	kg
3/8 x B	730	(3.25)	572	(2.54)	.02	(.01)
1/2 x B	1350	(6.01)	1057	(4.70)	.04	(.02)
5/8 x B	2160	(9.61)	1692	(7.52)	.07	(.03)
3/4 x B	3230	(14.37)	2530	(11.25)	.11	(.05)
7/8 x B	4480	(19.93)	3508	(15.61)	.14	(.06)

FIG. 15 & 15L

MACHINE THREAD HANGER ROD

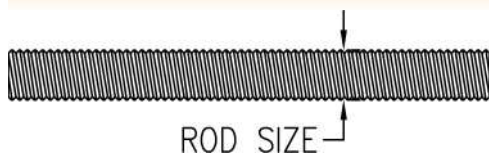


Function: Designed for use in pipe hanger assemblies.
 Right-Hand Threads (**Fig. 15**) or Right and Left-Hand Threads (**Fig. 15L**).
Material: Carbon steel (Type 304 or 316 Stainless Steel upon request)
Finish: Plain or electro-galvanized (Hot dipped galvanized upon request)
Ordering: Specify figure number, rod size, length (B), material, and finish.

Rod Size	Thread Length C		Max. Rec. Load				Wt. Per Inch	
			650°F (343°C)		750°F (399°C)			
			lbs.	kN	lbs.	kN	lbs.	kg
3/8 x B	2½	(63.5)	730	(3.25)	572	(2.54)	.03	(.01)
½ x B	2½	(63.5)	1350	(6.01)	1057	(4.70)	.06	(.03)
5/8 x B	2½	(63.5)	2160	(9.61)	1692	(7.52)	.09	(.04)
¾ x B	3	(76.2)	3230	(14.37)	2530	(11.25)	.13	(.06)
7/8 x B	3½	(88.9)	4480	(19.93)	3508	(15.61)	.17	(.08)
1 x B	4	(101.6)	5900	(26.24)	4620	(20.55)	.22	(.10)

FIG. 20 & 21

CONTINUOUS THREADED ROD



Function: Useful in applications where stud lengths cannot be predetermined.
Material: Carbon steel (Type 304 or 316 Stainless Steel upon request)
Finish: Plain (**Fig. 20**) or electro-galvanized Finish (**Fig. 21**) (Hot dipped galvanized upon request)
Ordering: Specify figure number, rod size, length, material, and finish.

Rod Size	Packaging Feet Per Bundle						Max. Rec. Load				Wt. Per Foot	
							650°F (343°C)		750°F (399°C)			
	6ft.	(1.83)	10ft.	(3.05)	12ft.	(3.66)	lbs.	kN	lbs.	kN	lbs.	kg
¼-20	300	(91.44)	500	(152.4)	600	(182.88)	240	(1.07)	188	(0.84)	.12	(.05)
⅜-16	150	(45.72)	250	(76.2)	240	(73.15)	730	(3.25)	572	(2.54)	.29	(.13)
½-13	72	(21.95)	120	(36.58)	144	(43.90)	1350	(6.01)	1057	(4.70)	.54	(.25)
⅝-11	48	(14.63)	80	(24.38)	96	(29.26)	2160	(9.61)	1692	(7.52)	.83	(.38)
¾-10	30	(9.14)	50	(15.24)	60	(18.29)	3230	(14.37)	2530	(11.25)	1.25	(.57)
7/8-9	24	(7.32)	40	(12.19)	48	(14.63)	4480	(19.93)	3508	(15.61)	1.65	(.75)
1-8	12	(3.66)	20	(6.10)	24	(7.32)	5900	(26.24)	4620	(20.55)	2.25	(1.02)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

THREADED ACCESSORIES



ROD SWIVEL ATTACHMENT

FIG. 020

Function: May be used as a branch line restraint for structural attachment. May be used in a pitched or sloped roof application, to meet requirements of NFPA 13, or may be used as an upper attachment with short hanger rod to omit seismic bracing.

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

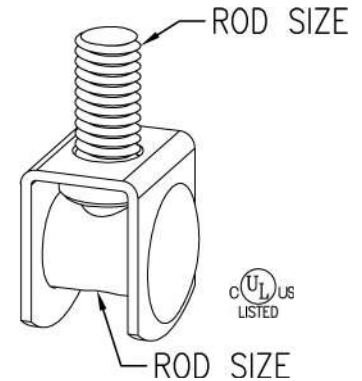
Material: Carbon steel

Finish: Electro-galvanized

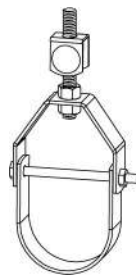
Install: Insert a #2 screwdriver through the tapped hole to access the head of attachment fastener. Tighten attachment fastener to desired attachment point, then remove screwdriver and thread $\frac{3}{8}$ -16 threaded rod into Fig. 020.

Approvals: Underwriters' Laboratories Listed in the U.S. (UL) and Canada (CUL).

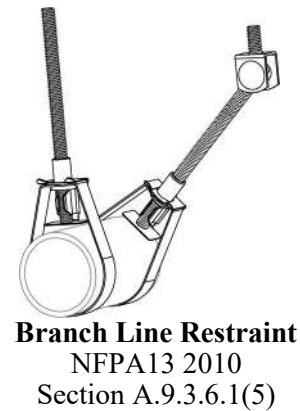
Ordering: Specify figure number.



Rod Size	Max. Pipe Size		Max. Rec. Load		Wt. Each	
			lbs.	kN	lbs.	kg
$\frac{3}{8}$	4	(100)	730	(3.25)	.10	(.05)



Used as an upper attachment with a short hanger rod to omit seismic bracing



EXTENSION PIECE

FIG. 25

Function: Designed for attaching hanger rod to various types of attachments. Allows for vertical adjustment of the rod. Frequently used in conjunction with Fig. 630 malleable iron beam clamp.

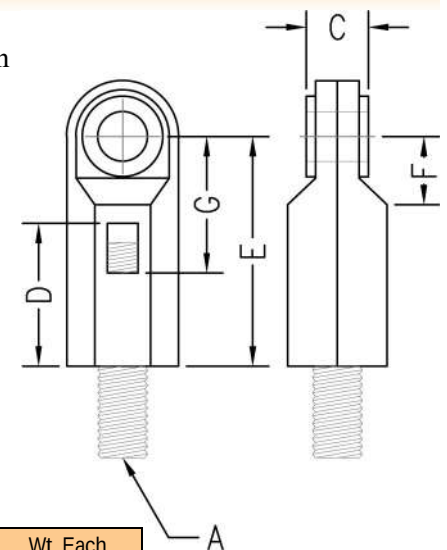
Material: Malleable iron

Finish: Plain or electro-galvanized

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

Rod Size A	For Pipe Sizes		B		C		D	
$\frac{3}{8}$	$\frac{1}{2}$ to 2	(15 to 50)	$\frac{1}{2}$	(12.7)	$\frac{1}{2}$	(12.7)	$1\frac{1}{4}$	(31.75)
$\frac{1}{2}$	$2\frac{1}{2}$ to $3\frac{1}{2}$	(65 to 90)	$\frac{1}{2}$	(12.7)	$\frac{5}{8}$	(15.88)	$1\frac{3}{8}$	(34.93)
$\frac{5}{8}$	4 & 5	(100 & 125)	$\frac{1}{2}$	(12.7)	$\frac{5}{8}$	(15.88)	$1\frac{1}{2}$	(38.1)
$\frac{3}{4}$	6 & 8	(150 & 200)	$\frac{1}{2}$	(12.7)	$\frac{5}{8}$	(15.88)	$1\frac{3}{4}$	(44.45)
$\frac{7}{8}$	10 & 12	(250 & 300)	$\frac{9}{16}$	(14.29)	$\frac{3}{4}$	(19.05)	$1\frac{7}{8}$	(47.63)

Rod Size A	E		F		G		Max. Rec. Load		Wt. Each	
							lbs.	kN	lbs.	kg
$\frac{3}{8}$	$2\frac{1}{16}$	(52.39)	$\frac{9}{16}$	(14.29)	$1\frac{1}{4}$	(31.75)	730	(3.25)	.20	(.09)
$\frac{1}{2}$	$2\frac{5}{16}$	(58.74)	$1\frac{1}{16}$	(17.46)	$1\frac{3}{8}$	(34.93)	1350	(6.01)	.43	(.20)
$\frac{5}{8}$	$2\frac{7}{16}$	(61.91)	$\frac{3}{4}$	(19.05)	$1\frac{7}{16}$	(36.51)	1550	(6.89)	.46	(.21)
$\frac{3}{4}$	$2\frac{7}{8}$	(73.03)	$\frac{7}{8}$	(22.23)	$1\frac{11}{16}$	(42.86)	2100	(9.34)	.63	(.29)
$\frac{7}{8}$	3	(76.2)	$\frac{7}{8}$	(22.23)	$1\frac{3}{4}$	(44.45)	2350	(10.45)	.67	(.30)

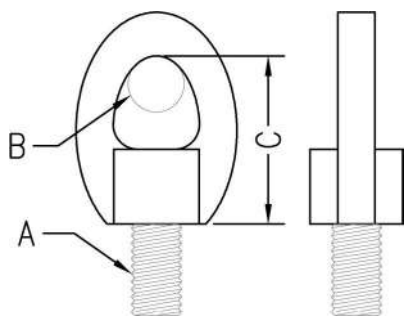


Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

THREADED ACCESSORIES

FIG. 30

EYE SOCKET

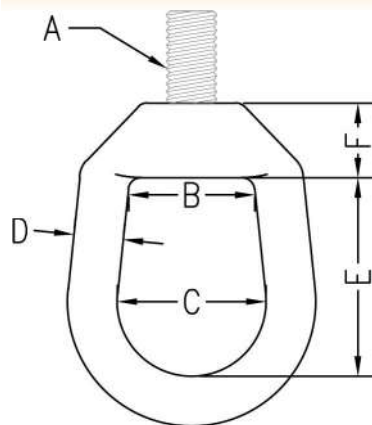


- Function:** Designed for attaching hanger rod to various types of hanger attachments.
- Material:** Malleable iron
- Finish:** Plain or electro-galvanized
- Approvals:** Complies with Federal Specifications A-A-1192A (Type 16) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 16) which supersedes ANSI/MSS SP-69.
- Ordering:** Specify figure number, rod size, and finish.

Rod Size A	For Pipe Sizes		Max. Bolt Size B		C		Max. Rec. Load		Wt. Each	
							lbs.	kN	lbs.	kg
1/4	3/8	(10)	1/4	(6.35)	1 3/8	(34.93)	240	(1.07)	.08	(.04)
3/8	1/2 to 2	(15 to 50)	1/4	(6.35)	1 3/8	(34.93)	610	(2.71)	.08	(.04)
1/2	2 1/2 to 3 1/2	(65 to 90)	1/4	(6.35)	1 9/16	(39.69)	1000	(4.45)	.11	(.05)
5/8	4 & 5	(100 & 125)	3/8	(9.53)	1 3/4	(44.45)	1400	(6.23)	.22	(.10)
3/4	6 & 8	(150 & 200)	1/2	(12.7)	2 1/4	(57.15)	2200	(9.79)	.30	(.14)
7/8	10 & 12	(250 & 300)	1/2	(12.7)	2 7/16	(61.91)	2300	(10.23)	.32	(.15)

FIG. 35 & 35L

WELDLESS EYE NUT



- Function:** Designed for use in high strength and high temperature piping applications. Fig. 35L is designed to be used in conjunction with Fig. 960 forged steel turnbuckle, in applications where a vertical adjustment may be necessary.
- Material:** Forged steel (Type 316 Stainless Steel upon request)
- Finish:** Plain or electro-galvanized (Hot dipped galvanized upon request)
- Approvals:** Complies with Federal Specifications A-A-1192A (Type 17) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 17) which supersedes ANSI/MSS SP-69.
- Ordering:** Specify figure number, rod size, material, and finish.

NOTE: Supports loads equal to the full limitation of the hanger rod.

Rod Size A	B		C		D		E		F		Max. Rec. Load				Wt. Each	
											650°F (343°C)		750°F (399°C)			
											lbs.	kN	lbs.	kN	lbs.	kg
3/8	1 1/4	(31.75)	1 1/2	(38.1)	1/2	(12.7)	2	(50.8)	1 1/16	(17.46)	730	(3.25)	572	(2.54)	.64	(.29)
1/2	1 1/4	(31.75)	1 1/2	(38.1)	1/2	(12.7)	2	(50.8)	1 1/16	(17.46)	1350	(6.01)	1057	(4.70)	.61	(.28)
5/8	1 1/4	(31.75)	1 1/2	(38.1)	1/2	(12.7)	2	(50.8)	1 1/16	(17.46)	2160	(9.61)	1692	(7.52)	.59	(.27)
3/4	1 1/4	(31.75)	1 1/2	(38.1)	1/2	(12.7)	2	(50.8)	1 1/16	(17.46)	3230	(14.37)	2530	(11.25)	.57	(.26)
7/8	1 11/16	(42.86)	2	(50.8)	3/4	(19.05)	2 5/8	(66.68)	1	(25.4)	4480	(19.93)	3508	(15.61)	1.67	(.76)
1	1 11/16	(42.86)	2	(50.8)	3/4	(19.05)	2 5/8	(66.68)	1	(25.4)	5900	(26.24)	4620	(20.55)	1.65	(.75)
1 1/8	2 1/4	(57.15)	2 1/2	(63.5)	1	(25.4)	3 3/8	(85.73)	1 1/4	(31.75)	7450	(33.14)	5834	(25.95)	3.68	(1.67)
1 1/4	2 1/4	(57.15)	2 1/2	(63.5)	1	(25.4)	3 3/8	(85.73)	1 1/4	(31.75)	9500	(42.26)	7440	(33.09)	3.57	(1.62)
1 1/2	2 1/4	(57.15)	2 1/2	(63.5)	1	(25.4)	3 3/8	(75.73)	1 1/4	(31.75)	13800	(61.39)	10807	(48.07)	3.43	(1.56)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

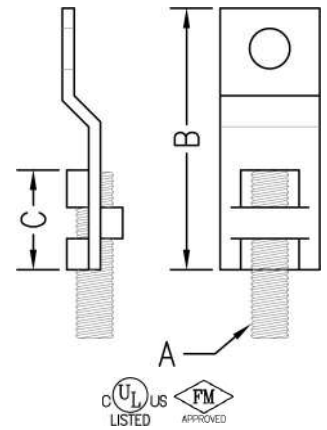
THREADED ACCESSORIES



STEEL EYE SOCKET

- Function:** Designed for attaching hanger rod to structures. Secured with listed fasteners.
- Material:** Carbon steel
- Finish:** Electro-galvanized
- Approvals:** Underwriters' Laboratories Listed in the U.S. (UL), Canada (CUL), and Factory Mutual Approved.
- Ordering:** Specify figure number and rod size.

FIG. 36

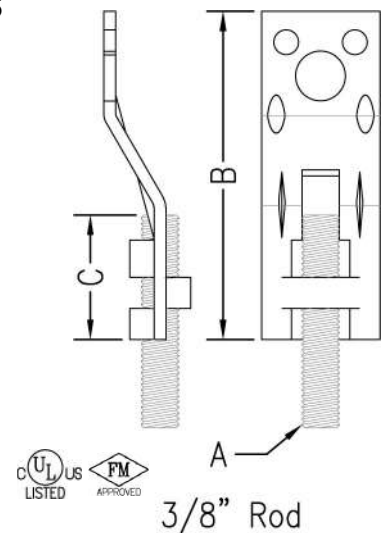


Rod Size A	Max. Pipe Size		Screw Size	B		C		Max. Rec. Load		Wt. Each	
								lbs.	kN	lbs.	kg
3/8	2	(50)	3/8 X 2 1/2 Lag	2 5/8	(66.68)	1 1/16	(26.99)	400	(1.78)	.08	(.04)
3/8	4	(100)	3/8 Bolt	2 5/8	(66.68)	1 1/16	(26.99)	730	(3.25)	.08	(.04)

STEEL EYE SOCKET

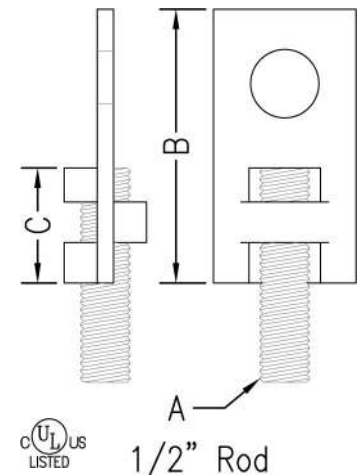
- Function:** Designed for attaching hanger rod to wood structures. Secured with Fig. 45 lag screw or two Fig. 48 wood drive screws, see chart.
- Material:** Carbon steel
- Finish:** Electro-galvanized
- Approvals:** Underwriters' Laboratories Listed in the U.S. (UL) and Canada (CUL) for 3/8" and 1/2" rod sizes. Factory Mutual Approved for 3/8" rod size only.
- Ordering:** Specify figure number and rod size.

FIG. 37



Rod Size A	Max. Pipe Size		Screw Size	B		C		Max. Rec. Load		Wt. Each	
								lbs.	kN	lbs.	kg
3/8	2	(50)	(2) #16 x 2	3 1/4	(82.55)	1 1/4	(31.75)	400	(1.78)	.11	(.05)
3/8	4	(100)	1/2 X 2 1/2	3 1/4	(82.55)	1 1/4	(31.75)	730	(3.25)	.11	(.05)
1/2	8	(200)	5/8 x 3	2 3/4	(69.85)	1 3/16	(30.16)	1350	(6.01)	.15	(.07)

NOTE: The 3/8" offset design provides full vertical rod adjustment.



Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

THREADED ACCESSORIES

FIG. 38

FORGED STEEL CLEVIS

Function: Designed for use as a convenient method of connecting hanger rods to pipe lugs, angles, etc. As a structural attachment it is most commonly used in conjunction with Fig. 935 welding lug.
Right-Hand Threads (**Fig. 38**) or Left-Hand Threads (**Fig. 38L**).

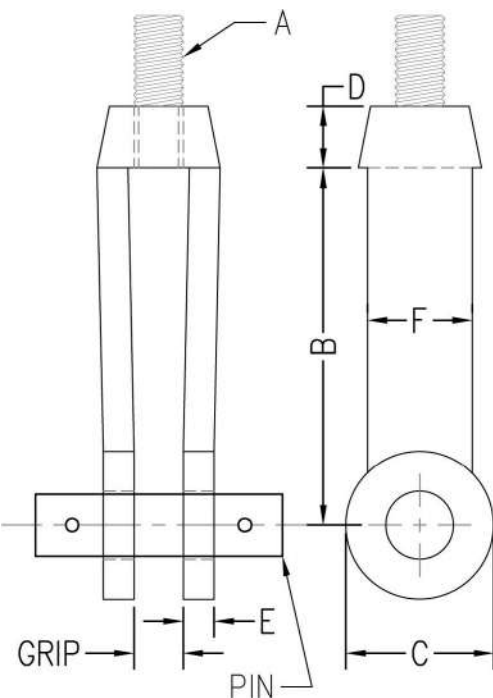
Material: Forged steel (Type 316 Stainless Steel upon request)

Finish: Plain or electro-galvanized (Hot dipped galvanized upon request)

Approvals: Complies with Federal Specifications A-A-1192A (Type 14) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 14) which supersedes ANSI/MSS SP-69.

Ordering: Specify figure number, size number, rod size, with or without pin, and finish. If other than standard combination is required, specify size number, rod size, pin size and grip.

NOTE: Regularly furnished with pin and cotter pins, unless specified otherwise.



Size No.	Rod Size A	Pin Size	Grip	B	C	D
2	3/8	1/2 (12.70)	1/2 (12.70)	3 5/8 (92.08)	1 1/2 (38.10)	5/8 (15.88)
2	1/2	5/8 (15.88)	1/2 (12.70)	3 5/8 (92.08)	1 1/2 (38.10)	5/8 (15.88)
2	5/8	3/4 (19.05)	5/8 (15.88)	3 5/8 (92.08)	1 1/2 (38.10)	5/8 (15.88)
2 1/2	3/4	7/8 (22.23)	3/4 (19.05)	5 (127.00)	2 (50.80)	7/8 (22.23)
2 1/2	7/8	1 (25.40)	7/8 (22.23)	5 (127.00)	2 (50.80)	7/8 (22.23)
3	1	1 1/8 (28.58)	1 (25.40)	5 (127.00)	3 (76.20)	1 5/16 (33.34)
3	1 1/4	1 3/8 (34.93)	1 1/4 (31.75)	5 (127.00)	3 (76.20)	1 5/16 (33.34)
3 1/2	1 1/2	1 5/8 (41.28)	1 1/2 (38.10)	6 (152.40)	3 1/2 (88.90)	1 5/8 (41.28)
4	1 3/4	1 7/8 (47.63)	1 1/2 (38.10)	6 (152.40)	4 (101.60)	1 3/4 (44.45)
5	2	2 1/4 (57.15)	2 1/2 (63.50)	7 (177.80)	5 (127.00)	2 1/4 (57.15)
6	2 1/4	2 1/2 (63.50)	2 1/2 (63.50)	8 (203.20)	6 (152.40)	2 3/4 (69.85)
6	2 1/2	2 3/4 (69.85)	2 1/2 (63.50)	8 (203.20)	6 (152.40)	2 3/4 (69.85)
7	2 3/4	3 (76.20)	2 1/2 (63.50)	8 (203.20)	7 (177.80)	3 (76.20)
7	3	3 1/4 (82.55)	2 1/2 (63.50)	9 (228.60)	7 (177.80)	3 (76.20)

Supports loads equal to the full limitation of the hanger rod.

Size No.	Rod Size A	E	F	Max Rec. Load				Wt. Each			
				650°F (343°C)		750°F (399°C)		w/o pin		with pin	
				lbs.	kN	lbs.	kN	lbs.	kg	lbs.	kg
2	3/8	5/16 (7.94)	1 1/16 (26.99)	730	(3.25)	572	(2.54)	.9	(0.41)	1.0	(.45)
2	1/2	5/16 (7.94)	1 1/16 (26.99)	1350	(6.01)	1057	(4.70)	.7	(0.32)	.9	(.41)
2	5/8	5/16 (7.94)	1 1/16 (26.99)	2160	(9.61)	1692	(7.52)	.7	(0.32)	.9	(.41)
2 1/2	3/4	3/8 (9.53)	1 1/4 (31.75)	3230	(14.37)	2530	(11.25)	2.5	(1.13)	3.0	(1.36)
2 1/2	7/8	3/8 (9.53)	1 1/4 (31.75)	4480	(19.93)	3508	(15.61)	2.5	(1.13)	3.4	(1.54)
3	1	1/2 (12.70)	1 1/2 (38.10)	5900	(26.24)	4620	(20.55)	4.0	(1.81)	5.1	(2.31)
3	1 1/4	1/2 (12.70)	1 1/2 (38.10)	9500	(42.26)	7440	(33.09)	3.8	(1.72)	5.5	(2.49)
3 1/2	1 1/2	1/2 (12.70)	1 3/4 (44.45)	13800	(61.39)	10807	(48.07)	6.0	(2.72)	8.5	(3.86)
4	1 3/4	1/2 (12.70)	2 (50.80)	18600	(82.74)	14566	(64.79)	8.0	(3.63)	12.9	(5.85)
5	2	5/8 (15.88)	2 1/2 (63.50)	24600	(109.43)	19265	(85.70)	16.0	(7.26)	23.3	(10.57)
6	2 1/4	3/4 (19.05)	3 (76.20)	32300	(143.68)	25295	(112.52)	26.0	(11.79)	35.1	(15.92)
6	2 1/2	3/4 (19.05)	3 (76.20)	39800	(177.04)	31169	(138.65)	25.5	(11.57)	36.0	(16.33)
7	2 3/4	7/8 (22.23)	3 1/2 (88.90)	49400	(219.74)	38687	(172.09)	36.0	(16.33)	50.0	(22.68)
7	3	7/8 (22.23)	3 1/2 (88.90)	60100	(267.34)	47066	(209.36)	35.0	(15.88)	51.5	(23.36)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

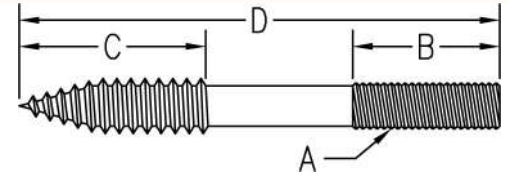
THREADED ACCESSORIES



COACH SCREW ROD

FIG. 40

- Function:** Designed for use as a vertical hanger attachment to wood structures.
- Material:** Carbon steel
- Finish:** Plain or electro-galvanized
- Ordering:** Specify figure number, rod size, length (D), and finish.

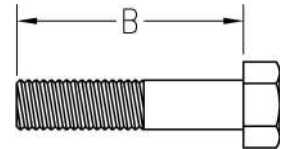


Rod Size A	Minimum Length				Max. Rec Load		Wt. Each									
							Length D									
	Machine B		Coach C		lbs.	kN	4 (101.6)		6 (152.4)		8 (203.2)		10 (254.0)		12 (304.8)	
							lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg
3/8	2	(50.80)	2	(50.80)	390	(1.73)	.12	(0.05)	.19	(0.09)	.25	(0.11)	.31	(0.14)	.37	(0.17)
1/2	2	(50.80)	2 1/2	(63.50)	640	(2.85)	.22	(0.10)	.34	(0.15)	.44	(0.20)	.56	(0.25)	.67	(0.30)

HEX HEAD BOLT

FIG. 41

- Function:** Designed for use as a fastening device.
- Material:** Carbon steel (Type 304 or 316 Stainless Steel upon request)
- Finish:** Plain or electro-galvanized (Hot dipped galvanized upon request)
- Ordering:** Specify figure number, diameter, length (B), material, and finish. If nuts are required, refer to Fig. 110 or 110H.



NOTE: Regularly furnished without nut.

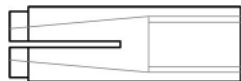
Length B		Wt. Each							
		5/8" Dia.		3/4" Dia.		7/8" Dia.		1" Dia.	
		lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg
2	(50.80)	.23	(0.10)	.35	(0.16)	--	--	--	--
2 1/4	(57.15)	.25	(0.11)	.39	(0.18)	--	--	--	--
2 1/2	(63.50)	.27	(0.12)	.42	(0.19)	.60	(0.27)	--	--
2 3/4	(69.85)	.29	(0.13)	.45	(0.20)	.64	(0.29)	.85	(0.39)
3	(76.20)	.32	(0.15)	.48	(0.22)	.68	(0.31)	.92	(0.42)
3 1/4	(82.55)	.34	(0.15)	.51	(0.23)	.72	(0.33)	.94	(0.43)
3 1/2	(88.90)	.36	(0.16)	.54	(0.24)	.76	(0.34)	.96	(0.44)
3 3/4	(95.25)	.38	(0.17)	.57	(0.26)	.80	(0.36)	1.10	(0.50)
4	(101.60)	.40	(0.18)	.60	(0.27)	.85	(0.39)	1.11	(0.50)

THREADED ACCESSORIES

FIG. 47

CONCRETE ANCHORS

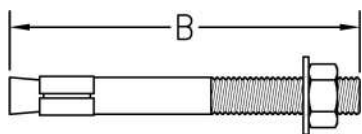
Fig. 47S
STEEL DROP-IN



Function: Designed to be inserted into a pre-drilled hole and set into place by means of a setting tool.
Material: Carbon steel
Finish: Electro-galvanized
Ordering: Specify figure number and rod size.

Rod Size	Hole Size		Anchor Length		Thread Length		Wt. Each	
							lbs.	kg
3/8	1/2	(12.70)	1 9/16	(39.69)	5/8	(15.88)	.07	(.03)
1/2	5/8	(15.88)	2	(50.80)	3/4	(19.05)	.13	(.06)
5/8	3/4	(19.05)	2 1/2	(63.50)	1	(25.40)	.28	(.13)

Fig. 47W
WEDGE

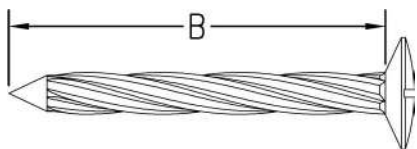


Function: Designed to be driven into a pre-drilled hole. The expansion of the case is controlled by the tightening of the nut, this eliminates the need for an exact hole size. Useful in applications where a high resistance to vibratory loads is desired.
Material: Carbon steel
Finish: Electro-galvanized
Ordering: Specify figure number, length (B), and rod size.

Rod Size	Thread Length		Minimum Embedment		Wt. Each	
					lbs.	kg
3/8 X B	1 1/8	(28.58)	1 5/8	(41.28)	.03	(.01)
1/2 X B	1 1/4	(31.75)	2 1/4	(57.15)	.06	(.03)
5/8 X B	1 1/2	(38.10)	2 3/4	(69.85)	.11	(.05)

FIG. 48

WOOD DRIVE SCREW



Function: Designed for use as a fastening device to wood structures.
Material: Carbon steel
Finish: Plain or electro-galvanized
Ordering: Specify figure number, size number, length (B), and finish.

Size No.	Length B		Wt. Each	
			lbs.	kg
14	1 1/2	(38.10)	.016	(.007)
16	2	(50.80)	.025	(.011)

THREADED ACCESSORIES



EYE RODS

FIG. 50 - 55L

Function: Designed for use in hanger assemblies. The welded design allows the eye to develop the full strength of the rod.

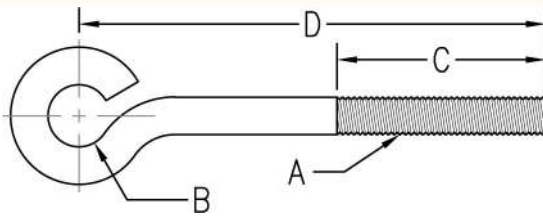
Right-Hand Threads (**Fig. 50 & 55**) or Left-Hand Threads (**Fig. 50L & 55L**).

Material: Carbon steel (Type 304 or 316 Stainless Steel upon request)

Finish: Plain or electro-galvanized (Hot dipped galvanized upon request)

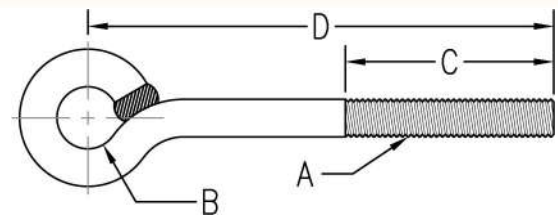
Ordering: Specify figure number, length (D), rod size, material, and finish.

Fig. 50 & 50L
EYE ROD



Rod Size A	B		Thread Length C		Max. Rec. Load	
					650°F (343°C)	
					lbs.	kN
3/8	5/8	(15.88)	2 1/2	(63.50)	240	(1.07)
1/2	3/4	(19.05)	2 1/2	(63.50)	440	(1.96)
5/8	7/8	(22.23)	2 1/2	(63.50)	705	(3.14)
3/4	1	(25.40)	3	(76.20)	1050	(4.67)
7/8	1 1/8	(28.58)	3 1/2	(88.90)	1470	(6.54)
1	1 1/4	(31.75)	4	(101.60)	1940	(8.63)

Fig. 55 & 55L
WELDED EYE ROD



Rod Size A	B		Thread Length C		Max. Rec. Load			
					650°F (343°C)		750°F (399°C)	
					lbs.	kN	lbs.	kN
3/8	5/8	(15.88)	2 1/2	(63.50)	730	(3.25)	572	(2.54)
1/2	3/4	(19.05)	2 1/2	(63.50)	1350	(6.01)	1057	(4.70)
5/8	7/8	(22.23)	2 1/2	(63.50)	2160	(9.61)	1692	(7.52)
3/4	1	(25.40)	3	(76.20)	3230	(14.37)	2530	(11.25)
7/8	1 1/8	(28.58)	3 1/2	(88.90)	4480	(19.93)	3508	(15.61)
1	1 1/4	(31.75)	4	(101.60)	5900	(26.24)	4620	(20.55)

Rod Size A	Wt. Each													
	Length D													
	8 (203.2)		10 (254.0)		12 (304.8)		14 (355.6)		18 (457.2)		24 (609.6)		30 (762.0)	
	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg
3/8	.32	(0.15)	.38	(0.17)	.44	(0.20)	.50	(0.23)	.63	(0.29)	.80	(0.36)	1.00	(0.45)
1/2	.60	(0.27)	.70	(0.32)	.82	(0.37)	.94	(0.43)	1.16	(0.53)	1.50	(0.68)	1.83	(0.83)
5/8	.97	(0.44)	1.14	(0.52)	1.31	(0.59)	1.49	(0.68)	1.84	(0.83)	2.36	(1.07)	2.88	(1.31)
3/4	1.44	(0.65)	1.68	(0.76)	1.94	(0.88)	2.19	(0.99)	2.68	(1.22)	3.44	(1.56)	4.19	(1.90)
7/8	2.04	(0.93)	2.32	(1.05)	2.68	(1.22)	3.02	(1.37)	3.73	(1.69)	4.72	(2.14)	5.74	(2.60)
1	2.67	(1.21)	3.11	(1.41)	3.56	(1.61)	4.00	(1.81)	4.89	(2.22)	6.78	(3.08)	8.18	(3.71)

Rod Size A	Wt. Each													
	Length D													
	36 (914.4)		42 (1066.8)		48 (1219.2)		54 (1371.6)		60 (1524.0)		66 (1676.4)		72 (1828.8)	
	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg
3/8	1.18	(0.54)	1.39	(0.63)	1.58	(0.72)	1.76	(0.80)	1.95	(0.88)	2.14	(0.97)	2.33	(1.06)
1/2	2.17	(0.98)	2.49	(1.13)	2.83	(1.28)	3.16	(1.43)	3.49	(1.58)	3.83	(1.74)	4.06	(1.84)
5/8	3.40	(1.54)	3.92	(1.78)	4.44	(2.01)	4.96	(2.25)	5.48	(2.49)	6.00	(2.72)	6.52	(2.96)
3/4	4.94	(2.24)	5.70	(2.59)	6.45	(2.93)	7.20	(3.27)	7.95	(3.61)	8.70	(3.95)	9.45	(4.29)
7/8	6.76	(3.07)	7.81	(3.54)	8.83	(4.01)	9.85	(4.47)	10.87	(4.93)	11.89	(5.39)	12.91	(5.86)
1	8.89	(4.03)	10.48	(4.75)	11.87	(5.38)	13.19	(5.98)	14.51	(6.58)	15.91	(7.22)	17.25	(7.82)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

THREADED
ACCESSORIES

CPVC
STRAPS

BAND
HANGERS

BEAM
CLAMPS

CLEVIS
HANGERS

PIPE ROLLER
SUPPORTS

SPLIT RING
HANGERS

PIPE
CLAMPS

PIPE
CLAMPS

CENTER LOAD
BEAM CLAMPS

PIPE SHIELDS,
INSULATION, & SADDLES

PIPE GUIDES
& SLIDES

WALL
BRACKETS

PIPE
SUPPORTS

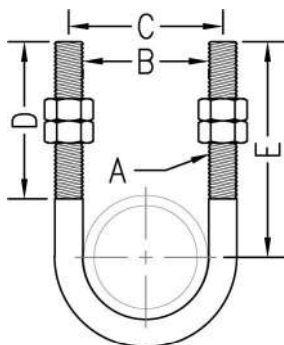
STRUCTURAL
ATTACHMENTS

SEISMIC
BRACING

THREADED ACCESSORIES

FIG. 90, 91, 93, 94, & 90S

STANDARD U-BOLT



- Function:** Designed for use as a support, anchor, or guide for various types of pipe. The PVC coating on Fig. 93 protects the surface of the pipe from contact with the metal surface of the U-Bolt.
- Material:** Carbon steel or Type 304 & 316 Stainless Steel (**Fig. 94**)
- Finish:** Plain (**Fig. 90**), Electro-Galvanized (**Fig. 91**), or PVC (**Fig. 93**) (Hot dipped galvanized upon request)
- Approvals:** Complies with Federal Specifications A-A-1192A (Type 24) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 24) which supersedes ANSI/MSS SP-69.
- Ordering:** Specify figure number, pipe size, material, and finish.

NOTE: Regularly furnished with nuts.

Pipe Size		Rod Size A	B		C		D		Tangent E		Max. Rec. Load				Wt. Each	
											650°F (343°C)		750°F (399°C)			
											lbs.	kN	lbs.	kN	lbs.	kg
1/2	(15)	1/4	15/16	(23.81)	13/16	(30.16)	23/8	(60.33)	23/4	(69.85)	580	(2.58)	454	(2.02)	.11	(.05)
3/4	(20)	1/4	11/8	(28.58)	13/8	(34.93)	23/8	(60.33)	23/4	(69.85)	580	(2.58)	454	(2.02)	.12	(.05)
1	(25)	1/4	13/8	(34.93)	15/8	(41.28)	23/8	(60.33)	23/4	(69.85)	580	(2.58)	454	(2.02)	.12	(.05)
11/4	(32)	3/8	111/16	(42.86)	21/16	(52.39)	23/8	(60.33)	27/8	(73.03)	1460	(6.49)	1143	(5.09)	.28	(.13)
11/2	(40)	3/8	2	(50.80)	23/8	(60.33)	21/2	(63.50)	3	(76.20)	1460	(6.49)	1143	(5.09)	.30	(.14)
2	(50)	3/8	27/16	(61.91)	213/16	(71.44)	21/2	(63.50)	31/4	(82.55)	1460	(6.49)	1143	(5.09)	.33	(.15)
21/2	(65)	1/2	215/16	(74.61)	37/16	(87.31)	3	(76.20)	33/4	(95.25)	2700	(12.01)	2114	(9.41)	.73	(.33)
3	(80)	1/2	3 9/16	(90.49)	41/16	(103.19)	3	(76.20)	4	(101.60)	2700	(12.01)	2114	(9.41)	.78	(.35)
31/2	(90)	1/2	41/16	(103.19)	49/16	(115.89)	3	(76.20)	41/4	(107.95)	2700	(12.01)	2114	(9.41)	.84	(.38)
4	(100)	1/2	49/16	(115.89)	51/16	(128.59)	3	(76.20)	41/2	(114.30)	2700	(12.01)	2114	(9.41)	.90	(.41)
5	(125)	1/2	55/8	(142.88)	61/8	(155.58)	3	(76.20)	5	(127.00)	2700	(12.01)	2114	(9.41)	1.01	(.46)
6	(150)	5/8	63/4	(171.45)	73/8	(187.33)	33/4	(95.25)	61/8	(155.58)	4320	(19.22)	3383	(15.05)	2.00	(.91)
8	(200)	5/8	83/4	(222.25)	93/8	(238.13)	33/4	(95.25)	71/8	(180.98)	4320	(19.22)	3383	(15.05)	2.33	(1.06)
10	(250)	3/4	107/8	(276.23)	115/8	(295.28)	4	(101.60)	83/8	(212.73)	6460	(28.74)	5059	(22.50)	4.91	(2.23)
12	(300)	7/8	127/8	(327.03)	133/4	(349.25)	41/4	(107.95)	95/8	(244.48)	8960	(39.86)	7017	(31.21)	7.73	(3.51)
14	(350)	7/8	141/8	(358.78)	15	(381.00)	41/4	(107.95)	101/4	(260.35)	8960	(39.86)	7017	(31.21)	8.30	(3.76)
16	(400)	7/8	161/8	(409.58)	17	(431.80)	41/4	(107.95)	111/4	(285.75)	8960	(39.86)	7017	(31.21)	9.20	(4.17)
18	(450)	1	181/8	(460.38)	191/8	(485.78)	43/4	(120.65)	125/8	(320.68)	11800	(52.49)	9241	(41.11)	13.5	(6.12)
20	(500)	1	201/8	(511.18)	211/8	(536.58)	43/4	(120.65)	135/8	(346.08)	11800	(52.49)	9241	(41.11)	14.6	(6.62)
24	(600)	1	241/8	(612.78)	251/8	(638.18)	43/4	(120.65)	155/8	(396.88)	11800	(52.49)	9241	(41.11)	16.9	(7.67)
30	(750)	1	301/8	(765.18)	311/8	(790.58)	43/4	(120.65)	185/8	(473.08)	11800	(52.49)	9241	(41.11)	19.1	(8.66)
36	(900)	1	361/8	(917.58)	371/8	(942.98)	43/4	(120.65)	215/8	(549.28)	11800	(52.49)	9241	(41.11)	23.2	(10.52)

Fig. 90S
SPECIAL U-BOLT

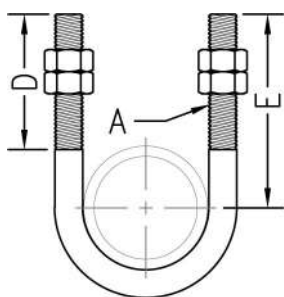


Fig. 90S Special U-Bolts are available upon request. Please specify:

- Figure Number
- Pipe Size
- Rod Size "A"
- Length of Threads "D"
- Tangent "E"
- Material
- Finish

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

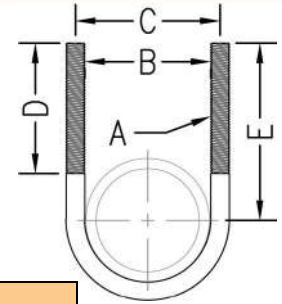
THREADED ACCESSORIES



LIGHT DUTY U-BOLT

FIG. 95

- Function:** Designed for use as a support, anchor, or guide for various types of pipe in light duty applications.
- Material:** Carbon steel (Type 304 or 316 Stainless Steel upon request)
- Finish:** Plain or electro-galvanized (Hot dipped galvanized upon request)
- Ordering:** Specify figure number, pipe size, material, and finish. If nuts are required, order Fig. 110 separately.



NOTE: Regularly furnished without nuts unless specified otherwise.

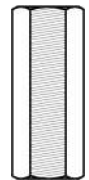
Pipe Size		Rod Size A		B		C		D		Tangent E		Max. Rec. Load		Wt. Each	
												lbs.	kN	lbs.	kg
1/2	(15)	1/4	15/16	(23.81)		13/16	(30.16)	13/4	(44.45)	15/16	(49.21)	580	(2.58)	.06	(0.03)
3/4	(20)	1/4	1 1/8	(28.58)		1 3/8	(34.93)	1 3/4	(44.45)	2 1/16	(52.39)	580	(2.58)	.07	(0.03)
1	(25)	1/4	1 3/8	(34.93)		1 5/8	(41.28)	1 3/4	(44.45)	2 3/16	(55.56)	580	(2.58)	.07	(0.03)
1 1/4	(32)	1/4	1 11/16	(42.86)		1 15/16	(49.21)	1 3/4	(44.45)	2 3/8	(60.33)	580	(2.58)	.08	(0.04)
1 1/2	(40)	1/4	2	(50.80)		2 1/4	(57.15)	1 3/4	(44.45)	2 7/16	(61.91)	580	(2.58)	.09	(0.04)
2	(50)	1/4	2 7/16	(61.91)		2 11/16	(68.26)	1 3/4	(44.45)	2 11/16	(68.26)	580	(2.58)	.10	(0.05)
2 1/2	(65)	3/8	2 5/16	(74.61)		3 5/16	(84.14)	2	(50.80)	3 1/16	(77.79)	1460	(6.49)	.28	(0.13)
3	(80)	3/8	3 9/16	(90.49)		3 15/16	(100.01)	2	(50.80)	3 3/8	(85.73)	1460	(6.49)	.31	(0.14)
3 1/2	(90)	3/8	4 1/16	(103.19)		4 7/16	(112.71)	2	(50.80)	3 5/8	(92.08)	1460	(6.49)	.35	(0.16)
4	(100)	3/8	4 9/16	(115.89)		4 15/16	(125.41)	2	(50.80)	3 7/8	(98.43)	1460	(6.49)	.38	(0.17)
5	(125)	3/8	5 5/8	(142.88)		6	(152.40)	2 1/4	(57.15)	4 9/16	(115.89)	1460	(6.49)	.45	(0.20)
6	(150)	1/2	6 3/4	(171.45)		7 1/4	(184.15)	2 1/4	(57.15)	5 1/16	(128.59)	2700	(12.01)	.95	(0.43)
8	(200)	1/2	8 3/4	(222.25)		9 1/4	(234.95)	2 1/4	(57.15)	6 1/16	(153.99)	2700	(12.01)	1.20	(0.54)
10	(250)	5/8	10 7/8	(276.23)		11 1/2	(292.10)	2 1/2	(63.50)	7 1/4	(184.15)	4320	(19.22)	2.30	(1.04)

STANDARD ROD COUPLING

FIG. 100

- Function:** Designed to provide a means of connecting two lengths of threaded rod with equal diameters.
- Material:** Carbon steel (Type 304 or 316 Stainless Steel upon request)
- Finish:** Plain or electro-galvanized
- Ordering:** Specify figure number, rod size, material, and finish.

Rod Size	Length		Hex Width		Max. Rec. Load		Wt. Each	
					lbs.	kN	lbs.	kg
1/4	7/8	(22.23)	3/8	(9.53)	240	(1.07)	.06	(0.03)
3/8	1 3/4	(44.45)	5/8	(15.88)	730	(3.25)	.11	(0.05)
1/2	1 3/4	(44.45)	1 1/16	(17.46)	1350	(6.01)	.11	(0.05)
5/8	2 1/8	(53.98)	1 3/16	(20.64)	2160	(9.61)	.17	(0.08)
3/4	2 1/4	(31.75)	1	(25.40)	3230	(14.37)	.28	(0.13)
7/8	2 1/2	(63.50)	1 1/4	(31.75)	4480	(19.93)	.56	(0.25)
1	2 3/4	(69.85)	1 3/8	(34.93)	5900	(26.24)	.72	(0.33)

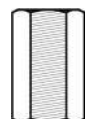


SHORT PATTERN ROD COUPLING

FIG. 104

- Function:** Designed to provide a means of connecting two lengths of threaded rod with equal diameters.
- Material:** Carbon steel
- Finish:** Plain or electro-galvanized
- Ordering:** Specify figure number, rod size, and finish.

Rod Size	Length		Hex Width		Max. Rec. Load		Wt. Each	
					lbs.	kN	lbs.	kg
3/8	1 1/8	(28.58)	1/2	(12.70)	730	(3.25)	.04	(0.02)
1/2	1 1/4	(31.75)	5/8	(15.88)	1350	(6.01)	.06	(0.03)

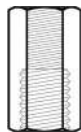


Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

THREADED ACCESSORIES

FIG. 105

REDUCING ROD COUPLING



Function: Designed to provide a means of connecting two lengths of threaded rod with different diameters.

Material: Carbon steel

Finish: Plain or electro-galvanized

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

Rod Size	Length		Hex Width		Max. Rec. Load		Wt. Each	
					lbs.	kN	lbs.	kg
3/8 X 1/4	1	(25.40)	1/2	(12.70)	240	(1.07)	.04	(0.02)
1/2 X 3/8	1 1/4	(31.75)	5/8	(15.88)	730	(3.25)	.07	(0.03)
5/8 X 1/2	1 1/4	(31.75)	13/16	(20.64)	1350	(6.01)	.14	(0.06)
3/4 X 5/8	1 1/2	(38.10)	1	(25.40)	2160	(9.61)	.13	(0.06)
7/8 X 3/4	1 3/4	(44.45)	1 1/4	(31.75)	3230	(14.37)	.26	(0.12)

FIG. 110 & 110H

HEX NUT



Function: Designed for use as a fastening device.

Material: Carbon steel (Type 304 or 316 Stainless Steel upon request)

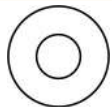
Finish: Plain or electro-galvanized (Hot dipped galvanized upon request)

Ordering: Specify figure number, rod size, material, and finish.
Standard Hex Nut (**Fig. 110**) or Heavy Hex Nut (**Fig. 110H**).

	Wt. Each																					
Rod Size	¹ / ₄		⁵ / ₁₆		³ / ₈		¹ / ₂		⁵ / ₈		³ / ₄		⁷ / ₈		1		^{1 1} / ₈		^{1 1} / ₄		^{1 1} / ₂	
	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg
Fig. 110	.01	(.01)	.01	(.01)	.02	(.01)	.04	(.02)	.07	(.03)	.12	(.05)	.19	(.09)	.28	(.13)	.40	(.18)	.54	(.24)	.94	(.43)
Fig. 110H	--	--	--	--	.03	(.01)	.07	(.03)	.12	(.05)	.19	(.09)	.30	(.14)	.43	(.20)	.59	(.27)	.79	(.36)	1.31	(.59)

FIG. 130

FLAT WASHER



Function: Designed to provide a greater bearing surface diameter.

Material: Carbon steel (Type 304 or 316 Stainless Steel upon request)

Finish: Plain or electro-galvanized (Hot dipped galvanized upon request)

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

Rod Size		1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 1/2
I.D.		5/16 (7.94)	7/16 (11.11)	9/16 (14.29)	11/16 (17.46)	13/16 (20.64)	15/16 (23.81)	1 1/16 (26.99)	1 1/4 (31.75)	1 3/8 (34.93)	1 5/8 (41.28)
O.D.		3/4 (19.05)	1 (25.40)	1 3/8 (34.93)	1 3/4 (44.45)	2 (50.80)	2 1/4 (57.15)	2 1/2 (63.50)	2 3/4 (69.85)	3 (76.20)	3 1/2 (88.90)
Wt. Each	lbs.	.01	.02	.04	.08	.11	.15	.19	.22	.26	.38
	kg	(.01)	(.01)	(.02)	(.04)	(.05)	(.07)	(.09)	(.10)	(.12)	(.17)

FIG. 134

LOCK WASHER



Function: Designed to prevent threaded fasteners from un-threading over time.

Material: Carbon steel (Type 304 or 316 Stainless Steel upon request)

Finish: Plain or electro-galvanized (Hot dipped galvanized upon request)

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

Rod Size	I.D.		O.D.		Wt. Each	
					lbs.	kg
3/8	7/16	(11.11)	11/16	(17.46)	.007	(.003)
1/2	9/16	(14.29)	7/8	(22.23)	.015	(.007)
5/8	11/16	(17.46)	1 1/16	(26.99)	.026	(.012)
3/4	13/16	(20.64)	1 1/4	(31.75)	.043	(.020)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

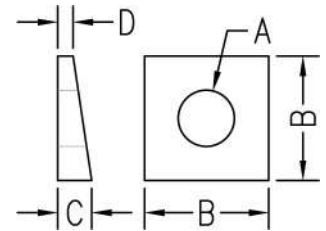
THREADED ACCESSORIES



BEVEL WASHER

FIG. 135

- Function:** Designed to be used on a tapered surface to permit the fastening of a bolt at a right angle.
- Material:** Malleable iron
- Finish:** Plain or electro-galvanized
- Ordering:** Specify figure number, rod size, and finish.

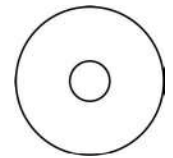


Rod Size	B		C		D		Wt. Each	
							lbs.	kg
3/8	1 1/4	(31.75)	1 1/32	(8.73)	5/32	(3.97)	.09	(.04)
1/2	1 1/4	(31.75)	1 1/32	(8.73)	5/32	(3.97)	.09	(.04)
5/8	1 3/4	(44.45)	1 3/32	(10.32)	5/32	(3.97)	.14	(.06)
3/4	1 1/2	(38.10)	1 5/32	(11.91)	7/32	(5.56)	.16	(.07)
7/8	2	(50.80)	9/16	(14.29)	7/32	(5.56)	.33	(.15)

FENDER WASHER

FIG. 136

- Function:** Designed to provide a greater bearing surface diameter.
- Material:** Carbon steel
- Finish:** Electro-galvanized
- Ordering:** Specify figure number and rod size.



Rod Size	I.D.		O.D.		Wt. Each	
					lbs.	kg
3/8	1 3/32	(10.32)	1 1/2	(38.10)	.03	(.01)
1/2	1 7/32	(13.49)	2	(50.80)	.03	(.01)

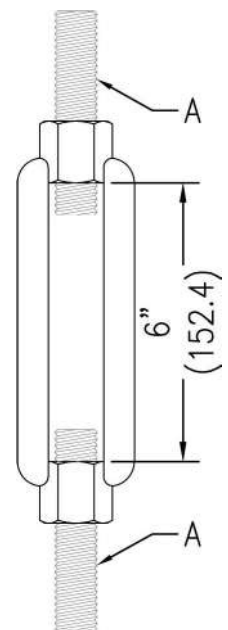
TURNBUCKLE

FIG. 960

- Function:** Designed for use as a hanger rod connection on heavy loads when an adjustment of up to 6 (152.4) inches is required.
- Material:** Forged steel (Type 316 Stainless Steel upon request)
- Finish:** Plain or electro-galvanized (Hot dipped galvanized upon request)
- Approvals:** Complies with Federal Specification A-A-1192A (Type 13) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 13) which supersedes ANSI/MSS SP-69.
- Ordering:** Specify figure number, rod size, and finish.

NOTE: Openings of 3" (76.2), 9" (228.6) and 12" (304.8) are available upon request.

Rod Size A	Max. Rec. Load				Wt. Each	
	650°F (343°C)		750°F (399°C)			
	lbs.	kN	lbs.	kN	lbs.	kg
3/8	730	(3.25)	572	(2.54)	.50	(.23)
1/2	1350	(6.01)	1057	(4.70)	.75	(.34)
5/8	2160	(9.61)	1692	(7.52)	1.12	(.51)
3/4	3230	(14.37)	2530	(11.25)	1.75	(.79)
7/8	4480	(19.93)	3508	(15.61)	1.83	(.83)
1	5900	(26.24)	4620	(20.55)	2.60	(1.18)
1 1/8	7450	(33.14)	5834	(25.95)	3.68	(1.67)
1 1/4	9500	(42.26)	7440	(33.09)	4.75	(2.15)
1 1/2	13800	(61.39)	10807	(48.07)	6.25	(2.83)

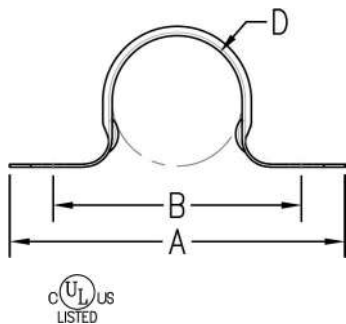


Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

CPVC STRAPS

FIG. 070

CPVC TWO-HOLE PIPE STRAP



Function: Designed to support CPVC pipe horizontally from the side or bottom of beam. Fig. 070 can only be used as a guide on top of beam or on vertical piping. Fig. 070 also acts as a restrainer to prevent the thrust of a sprinkler head during activation when mounted on top of structure. Fig. 070 may be installed onto wood using supplied fasteners or into, minimum 20 gauge, steel using two 1/4" X 1" tek type screws (not included). Features flared edges to protect piping as it slides through the installed fitting and retaining dimples to allow for easy installation onto pipe.

Size: 3/4" (20) through 2" (50) CPVC pipe.

Material: Carbon Steel

Finish: Pre-galvanized

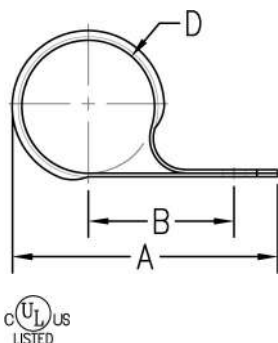
Approvals: Underwriters Laboratories listed for US and Canada.

Ordering: Specify figure number and pipe size.

Pipe Size	A		B		D Nominal		Box Qty.	Max. Spacing		Appx. Wt. Per 100	
								ft.	m	lbs.	kg
3/4 (20)	3 1/16	(77.79)	2 3/16	(55.56)	1.050	(26.67)	100	5.5	(1.68)	7.50	(3.40)
1 (25)	3 3/8	(85.73)	2 1/2	(63.50)	1.315	(33.40)	100	6	(1.83)	8.20	(3.72)
1 1/4 (32)	3 3/4	(95.25)	2 7/8	(73.03)	1.660	(42.16)	100	6.5	(1.98)	9.40	(4.26)
1 1/2 (40)	4 1/8	(104.78)	3 1/4	(82.55)	1.900	(48.26)	100	7	(2.13)	10.40	(4.72)
2 (50)	4 3/8	(111.13)	3 1/2	(88.90)	2.375	(60.33)	100	8	(2.44)	11.90	(5.40)

FIG. 075

CPVC ONE-HOLE WRAP AROUND



Function: Designed to support CPVC pipe horizontally from the side of a beam. Fig. 075 must be installed with the mounting tab oriented over top of piping on the side of a beam. Fig. 075 can only be used as a guide on top of beam or on vertical piping. Fig. 075 may be installed onto wood using supplied fasteners or into, minimum 20 gauge, steel using one 1/4" X 1" tek type screw (not included). Features flared edges to protect piping as it slides through the installed fitting.

Size: 3/4" (20) through 2" (50) CPVC pipe.

Material: Carbon Steel

Finish: Pre-galvanized

Approvals: Underwriters Laboratories listed for US and Canada.

Ordering: Specify figure number and pipe size.

Pipe Size	A		B		D Nominal		Box Qty.	Max. Spacing		Appx. Wt. Per 100	
								ft.	m	lbs.	kg
3/4 (20)	2 3/8	(60.33)	1 3/8	(34.93)	1.050	(26.67)	100	5.5	(1.68)	8.70	(3.95)
1 (25)	2 5/8	(66.68)	1 7/16	(36.51)	1.315	(33.40)	100	6	(1.83)	9.40	(4.26)
1 1/4 (32)	2 7/8	(73.03)	1 9/16	(39.69)	1.660	(42.16)	100	6.5	(1.98)	11.00	(4.99)
1 1/2 (40)	3 1/16	(77.79)	1 5/8	(41.28)	1.900	(48.26)	100	7	(2.13)	11.90	(5.40)
2 (50)	3 7/16	(87.31)	1 13/16	(46.04)	2.375	(60.33)	100	8	(2.44)	14.10	(6.40)

CPVC STRAPS



CPVC TWO-HOLE STAND OFF STRAP

FIG. 076

Function: Designed to support CPVC pipe horizontally from the side or bottom of beam, or composite wood joists with a minimum of $\frac{3}{8}$ " web thickness. Fig. 076 can only be used as a guide on top of beam or on vertical piping. Fig. 076 may be installed onto wood using supplied fasteners. Intended for attachment to concrete, steel structural members, and sheet metal, with fasteners and fastening methods that comply with NFPA13 requirements. Features flared edges to protect piping as it slides through the installed fitting.

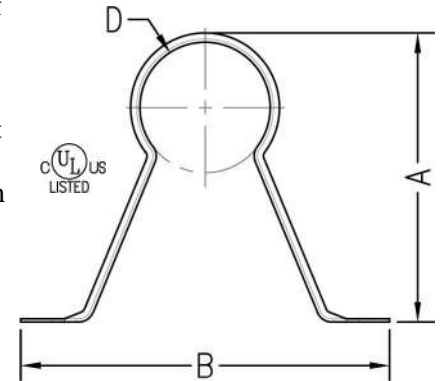
Size: $\frac{3}{4}$ " (20) through 2" (50) CPVC pipe.

Material: Carbon Steel

Finish: Pre-galvanized

Approvals: Underwriters Laboratories listed for US and Canada.

Ordering: Specify figure number and pipe size.



Pipe Size		A		B		D Nominal		Box Qty.	Max. Spacing		Appx. Wt. Per 100	
									ft.	m	lbs.	kg
$\frac{3}{4}$	(20)	$2\frac{9}{16}$	(65.09)	$4\frac{1}{4}$	(107.95)	1.050	(26.67)	100	5.5	(1.68)	12.10	(5.49)
1	(25)	$2\frac{13}{16}$	(71.44)	$4\frac{1}{2}$	(114.30)	1.315	(33.40)	100	6	(1.83)	12.80	(5.81)
$1\frac{1}{4}$	(32)	$3\frac{3}{16}$	(80.96)	$4\frac{5}{8}$	(117.48)	1.660	(42.16)	100	6.5	(1.98)	14.10	(6.40)
$1\frac{1}{2}$	(40)	$3\frac{7}{16}$	(87.31)	5	(127.00)	1.900	(48.26)	100	7	(2.13)	15.20	(6.89)
2	(50)	$3\frac{7}{8}$	(98.43)	5	(127.00)	2.375	(60.33)	100	8	(2.44)	16.40	(7.44)

CPVC TWO-HOLE SIDE MOUNT STRAP

FIG. 077

Function: Designed to support CPVC pipe horizontally from the side or bottom of beam. Fig. 077 can only be used as a guide on top of beam or on vertical piping. Fig. 077 also acts as a restrainer to prevent the thrust of a sprinkler head during activation when mounted on top of structure. Fig. 077 may be installed onto wood using supplied fasteners or into, minimum 20 gauge, steel using two $\frac{1}{4}$ " X 1" tek type screws (not included). Features flared edges to protect piping and retaining dimples to allow for easy installation onto pipe.

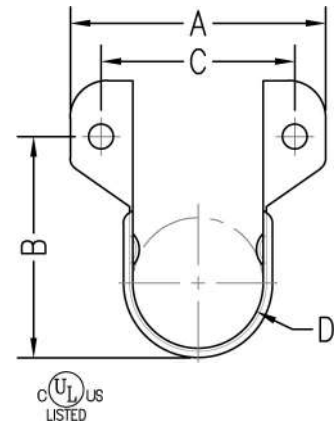
Size: $\frac{3}{4}$ " (20) through 2" (50) CPVC pipe.

Material: Carbon Steel

Finish: Pre-galvanized

Approvals: Underwriters Laboratories listed for US and Canada.

Ordering: Specify figure number and pipe size.



Pipe Size		A		B		C		D Nominal		Box Qty.	Max. Spacing		Appx. Wt. Per 100	
											ft.	m	lbs.	kg
$\frac{3}{4}$	(20)	$2\frac{5}{16}$	(58.74)	$1\frac{7}{8}$	(47.63)	$1\frac{11}{16}$	(42.86)	1.050	(26.67)	100	5.5	(1.68)	8.50	(3.86)
1	(25)	$2\frac{9}{16}$	(65.09)	$2\frac{3}{16}$	(55.56)	$1\frac{15}{16}$	(49.21)	1.315	(33.40)	100	6	(1.83)	9.40	(4.26)
$1\frac{1}{4}$	(32)	$2\frac{15}{16}$	(74.61)	$2\frac{1}{2}$	(63.50)	$2\frac{5}{16}$	(58.74)	1.660	(42.16)	100	6.5	(1.98)	10.40	(4.72)
$1\frac{1}{2}$	(40)	$3\frac{1}{4}$	(82.55)	$2\frac{13}{16}$	(71.44)	$2\frac{5}{8}$	(66.68)	1.900	(48.26)	100	7	(2.13)	11.30	(5.13)
2	(50)	$3\frac{5}{8}$	(92.08)	$3\frac{1}{4}$	(82.55)	3	(76.20)	2.375	(60.33)	100	8	(2.44)	13.20	(5.99)

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BAND HANGERS



NFPA SWIVEL RING HANGER

FIG. 141 & 141F

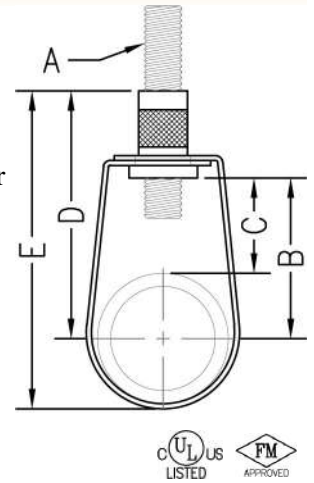
Function: Designed for the suspension of non-insulated stationary pipe lines. The knurled insert nut that allows a vertical adjustment after installation, is tapped to NFPA reduced rod size standards. Captured knurled insert nut present on pipe sizes $\frac{1}{2}$ " (15mm) to 2" (50mm). The capture is permanent in the bottom portion of the band, allowing the hanger to be opened during installation if desired, but preventing the knurled insert nut from falling completely out. Fig. 141F has a layer of felt which separates the pipe from the hanger to reduce vibration and sound.

Material: Carbon steel

Finish: Pre-galvanized (Fig. 141) or pre-galvanized with felt lining (Fig. 141F)

Approvals: Underwriters' Laboratories Listed in the U.S. (UL), Canada (CUL), for use with standard steel pipe sizes $\frac{3}{4}$ " (20mm) to 8" (200mm) and CPVC pipe size $\frac{3}{4}$ " (20mm) to 4" (100mm). Factory Mutual Approved for steel pipe sizes $\frac{3}{4}$ " (20mm) to 8" (200mm). Complies with Federal Specifications A-A-1192A (Type 10), and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 10) which supersedes ANSI/MSS SP-69.

Ordering: Specify figure number and pipe size.



NOTE: If ordering Fig. 141F felt lined hangers for pipe sizes of $3\frac{1}{2}$ " (90mm) or under, order the next largest size to allow for the thickness of the felt lining. Metric knurl insert nuts available upon request.

Pipe Size		Rod Size	B		Adj. C		D		E		Max. Rec. Load		Wt. Each	
											lbs.	kN	lbs.	kg
$\frac{1}{2}$	(15)	$\frac{3}{8}$	$1\frac{7}{8}$	(47.63)	$1\frac{7}{16}$	(36.51)	$2\frac{3}{4}$	(69.85)	$3\frac{1}{16}$	(77.79)	300	(1.33)	.10	(.05)
$\frac{3}{4}$	(20)	$\frac{3}{8}$	$1\frac{11}{16}$	(42.86)	$1\frac{1}{8}$	(28.58)	$2\frac{1}{2}$	(63.50)	$3\frac{1}{16}$	(77.79)	300	(1.33)	.10	(.05)
1	(25)	$\frac{3}{8}$	$1\frac{5}{8}$	(41.28)	1	(25.40)	$2\frac{1}{2}$	(63.50)	$3\frac{3}{16}$	(80.96)	300	(1.33)	.10	(.05)
$1\frac{1}{4}$	(32)	$\frac{3}{8}$	$1\frac{15}{16}$	(49.21)	$1\frac{1}{16}$	(26.99)	$2\frac{13}{16}$	(71.44)	$3\frac{9}{16}$	(90.49)	300	(1.33)	.11	(.05)
$1\frac{1}{2}$	(40)	$\frac{3}{8}$	$2\frac{1}{8}$	(53.98)	$1\frac{1}{16}$	(26.99)	$3\frac{1}{8}$	(79.38)	$3\frac{7}{8}$	(98.43)	300	(1.33)	.11	(.05)
2	(50)	$\frac{3}{8}$	$2\frac{7}{16}$	(61.91)	$1\frac{1}{8}$	(28.58)	$3\frac{5}{16}$	(84.14)	$4\frac{3}{8}$	(111.13)	300	(1.33)	.14	(.06)
$2\frac{1}{2}$	(65)	$\frac{3}{8}$	$3\frac{1}{16}$	(77.79)	$1\frac{5}{8}$	(41.28)	$3\frac{15}{16}$	(100.01)	$5\frac{3}{8}$	(136.53)	525	(2.34)	.19	(.09)
3	(80)	$\frac{3}{8}$	$3\frac{11}{16}$	(93.66)	$1\frac{7}{8}$	(47.63)	$4\frac{9}{16}$	(115.89)	$6\frac{5}{16}$	(160.34)	525	(2.34)	.23	(.10)
$3\frac{1}{2}$	(90)	$\frac{3}{8}$	$3\frac{3}{4}$	(95.25)	$1\frac{7}{8}$	(47.63)	$4\frac{5}{8}$	(117.48)	$6\frac{5}{8}$	(168.28)	525	(2.34)	.25	(.11)
4	(100)	$\frac{3}{8}$	$4\frac{3}{16}$	(106.36)	$1\frac{7}{8}$	(47.63)	$5\frac{1}{16}$	(128.59)	$7\frac{5}{16}$	(185.74)	650	(2.89)	.30	(.14)
5	(125)	$\frac{1}{2}$	$4\frac{5}{8}$	(117.48)	$1\frac{5}{8}$	(41.28)	$5\frac{5}{8}$	(142.88)	$8\frac{3}{8}$	(212.73)	1000	(4.45)	.50	(.23)
6	(150)	$\frac{1}{2}$	$5\frac{5}{8}$	(142.88)	$2\frac{1}{4}$	(57.15)	$6\frac{1}{2}$	(165.10)	$9\frac{13}{16}$	(249.24)	1000	(4.45)	.58	(.26)
8	(200)	$\frac{1}{2}$	$6\frac{13}{16}$	(173.04)	$2\frac{7}{16}$	(61.91)	$7\frac{15}{16}$	(201.61)	$12\frac{1}{4}$	(311.15)	1000	(4.45)	.90	(.41)

SURGE RESTRAINT

FIG. 055

Function: Designed to restrict the upward movement of activated fire sprinkler systems. Grips ring hanger, NOT THE NUT, and allows for fine tuning adjustments. Listed for use with PHD Manufacturing, Inc. Figure 141 ring hangers only.

Material: Spring Steel

Finish: Powder Coated

Install: Installs easily before or after pipe installation and without tools. Simply clip Fig. 055 onto Fig. 141 ring hanger and run the hanger rod down to the bottom plate surface to ensure proper restraint.

Approvals: Underwriters Laboratories listed for US and Canada.

Ordering: Specify figure number.

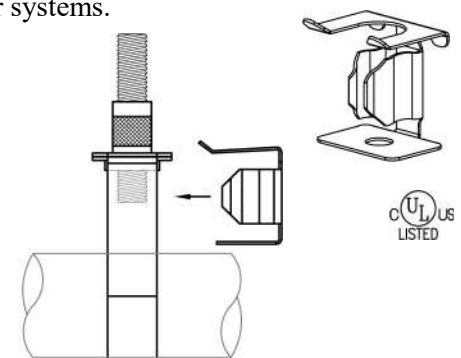


Fig. 055

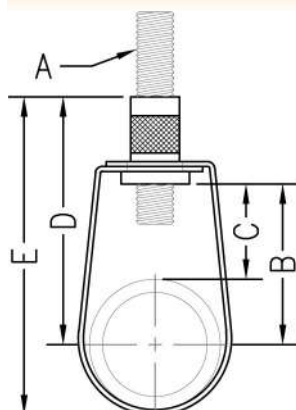
(Pictured With Fig. 141)

NOTE: For use up to 2" (50) pipe, one size fits all.

BAND HANGERS

FIG. 143

PVC COATED SWIVEL RING HANGER



Function: Designed for the suspension of non-insulated stationary pipe lines. The PVC coating on Fig. 143 protects the pipe from contact with the metal surface of the hanger. Frequently used with Aluminum, Glass, Plastic, Brass, or Copper pipe lines. This product is NOT compatible with CPVC pipe.

Material: Carbon steel

Finish: Pre-galvanized with PVC coating

Approvals: Underwriters' Laboratories Listed in the U.S. (UL), Canada (CUL), and Factory Mutual Approved for sizes $\frac{3}{4}$ " (20mm) to 8" (200mm). Complies with Federal Specifications A-A-1192A (Type 10), and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 10) which supersedes ANSI/MSS SP-69.

Ordering: Specify figure number and pipe size.

NOTE: Metric knurl insert nuts available upon request



Pipe Size		Rod Size	B		Adj. C		D		E		Max. Rec. Load		Wt. Each	
											lbs.	kN	lbs.	kg
$\frac{1}{2}$	(15)	$\frac{3}{8}$	$\frac{17}{8}$	(47.63)	$\frac{17}{16}$	(36.51)	$2\frac{3}{4}$	(69.85)	$3\frac{1}{16}$	(77.79)	300	(1.33)	.11	(.05)
$\frac{3}{4}$	(20)	$\frac{3}{8}$	$1\frac{11}{16}$	(42.86)	$\frac{1}{8}$	(28.58)	$2\frac{1}{2}$	(63.50)	$3\frac{1}{16}$	(77.79)	300	(1.33)	.13	(.06)
1	(25)	$\frac{3}{8}$	$1\frac{5}{8}$	(41.28)	1	(25.40)	$2\frac{1}{2}$	(63.50)	$3\frac{3}{16}$	(80.96)	300	(1.33)	.13	(.06)
$1\frac{1}{4}$	(32)	$\frac{3}{8}$	$1\frac{15}{16}$	(49.21)	$\frac{1}{16}$	(26.99)	$2\frac{13}{16}$	(71.44)	$3\frac{9}{16}$	(90.49)	300	(1.33)	.15	(.07)
$1\frac{1}{2}$	(40)	$\frac{3}{8}$	$2\frac{1}{8}$	(53.98)	$\frac{1}{16}$	(26.99)	$3\frac{1}{8}$	(79.38)	$3\frac{7}{8}$	(98.43)	300	(1.33)	.17	(.08)
2	(50)	$\frac{3}{8}$	$2\frac{7}{16}$	(61.91)	$\frac{1}{8}$	(28.58)	$3\frac{5}{16}$	(84.14)	$4\frac{3}{8}$	(111.13)	300	(1.33)	.18	(.08)
$2\frac{1}{2}$	(65)	$\frac{3}{8}$	$3\frac{1}{16}$	(77.79)	$\frac{1}{8}$	(41.28)	$3\frac{15}{16}$	(100.01)	$5\frac{3}{8}$	(136.53)	525	(2.34)	.19	(.09)
3	(80)	$\frac{3}{8}$	$3\frac{11}{16}$	(93.66)	$\frac{1}{8}$	(47.63)	$4\frac{9}{16}$	(115.89)	$6\frac{5}{16}$	(160.34)	525	(2.34)	.23	(.10)
$3\frac{1}{2}$	(90)	$\frac{3}{8}$	$3\frac{3}{4}$	(95.25)	$\frac{1}{8}$	(47.63)	$4\frac{5}{8}$	(117.48)	$6\frac{5}{8}$	(168.28)	525	(2.34)	.25	(.11)
4	(100)	$\frac{3}{8}$	$4\frac{3}{16}$	(106.36)	$\frac{1}{8}$	(47.63)	$5\frac{1}{16}$	(128.59)	$7\frac{5}{16}$	(185.74)	650	(2.89)	.30	(.14)
5	(125)	$\frac{1}{2}$	$4\frac{5}{8}$	(117.48)	$\frac{1}{8}$	(41.28)	$5\frac{5}{8}$	(142.88)	$8\frac{3}{8}$	(212.73)	1000	(4.45)	.50	(.23)
6	(150)	$\frac{1}{2}$	$5\frac{5}{8}$	(142.88)	$2\frac{1}{4}$	(57.15)	$6\frac{1}{2}$	(165.10)	$9\frac{13}{16}$	(249.24)	1000	(4.45)	.58	(.26)
8	(200)	$\frac{1}{2}$	$6\frac{13}{16}$	(173.04)	$2\frac{7}{16}$	(61.91)	$7\frac{15}{16}$	(201.61)	$12\frac{1}{4}$	(311.15)	1000	(4.45)	.90	(.41)

BAND HANGERS

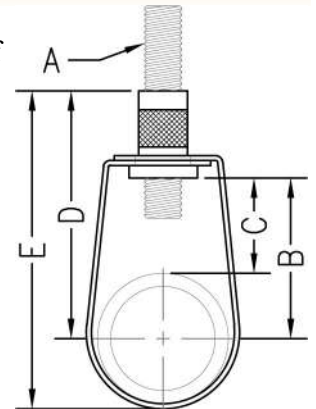


SWIVEL RING HANGER

FIG. 151 & 151F

- Function:** Designed for the suspension of non-insulated stationary pipe lines. The knurled insert nut, allows for vertical adjustment after installation. Fig. 151F has a layer of felt which separates the pipe from the hanger to reduce vibration and sound.
- Material:** Carbon steel
- Finish:** Pre-galvanized (**Fig. 151**) or pre-galvanized with felt lining (**Fig. 151F**)
- Approvals:** Underwriters' Laboratories Listed in the U.S. (UL) and Canada (CUL), and Factory Mutual Approved for all sizes. Complies with Federal Specification A-A-1192A (Type 10), and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 10) which supersedes ANSI/MSS SP-69.
- Ordering:** Specify figure number and pipe size.

NOTE: If ordering Fig. 151F felt lined hangers for pipe sizes of 3 1/2" (90mm) or under, order the next largest size to allow for the thickness of the felt lining.

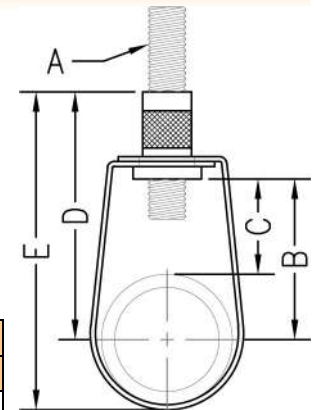


Pipe Size	Rod Size	B		Adj. C		D		E		Max. Rec. Load		Wt. Each	
										lbs.	kN	lbs.	kg
2 1/2 (65)	1/2	2 3/4	(69.85)	1 1/4	(31.75)	3 11/16	(93.66)	5 1/8	(130.18)	600	(2.67)	.33	(.15)
3 (80)	1/2	3 1/8	(79.38)	1 1/8	(28.58)	4	(101.60)	5 7/8	(149.23)	600	(2.67)	.35	(.16)
3 1/2 (90)	1/2	3 5/8	(92.08)	1 1/2	(38.10)	4 5/16	(109.54)	6 5/8	(168.28)	600	(2.67)	.37	(.17)
4 (100)	5/8	3 7/8	(98.43)	1 1/4	(31.75)	4 15/16	(125.41)	7 1/8	(180.98)	1000	(4.45)	.48	(.22)
5 (125)	5/8	3 3/8	(85.73)	1 3/8	(34.93)	5 5/8	(142.88)	8 1/2	(215.90)	1000	(4.45)	.57	(.26)
6 (150)	3/4	5 5/16	(134.94)	2	(50.80)	6 11/16	(169.86)	10 1/8	(257.18)	1250	(5.56)	1.06	(.48)
8 (200)	3/4	6 15/16	(176.21)	2 5/8	(66.68)	8 5/16	(211.14)	12 7/8	(327.03)	1250	(5.56)	1.32	(.60)

COPPER TUBING SWIVEL RING HANGER

FIG. 152 & 154

- Function:** Designed for the suspension of non-insulated stationary copper tubing. The knurled insert allows for vertical adjustment after installation. The PVC coating on Fig. 154 protects the tubing from contact with the metal surface of the hanger.
- Material:** Carbon steel
- Finish:** Copper color epoxy (**Fig. 152**) Copper color epoxy with PVC coating (**Fig. 154**)
- Approvals:** Complies with Federal Specification A-A-1192A (Type 10) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 10) which supersedes ANSI/MSS SP-69.
- Ordering:** Specify figure number and tube size.

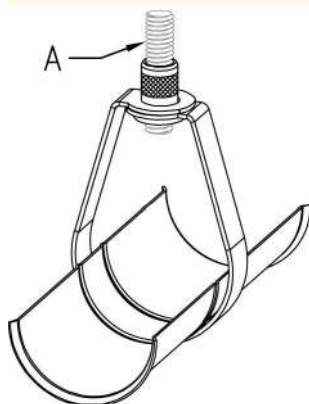


Tube Size	Rod Size	B		Adj. C		D		E		Max. Rec. Load		Wt. Each	
										lbs.	kN	lbs.	kg
1/2 (15)	3/8	1 13/16	(46.04)	1 1/2	(38.10)	2 11/16	(68.26)	3	(76.20)	300	(1.33)	.08	(.04)
3/4 (20)	3/8	1 5/8	(41.28)	1 3/16	(30.16)	2 1/2	(63.50)	2 15/16	(74.61)	300	(1.33)	.08	(.04)
1 (25)	3/8	1 9/16	(39.69)	1	(25.40)	2 9/16	(65.09)	3	(76.20)	300	(1.33)	.08	(.04)
1 1/4 (32)	3/8	1 5/8	(41.28)	1 5/16	(23.81)	2 1/2	(63.50)	3 3/16	(80.96)	300	(1.33)	.09	(.04)
1 1/2 (40)	3/8	1 11/16	(42.86)	7/8	(22.23)	2 9/16	(65.09)	3 3/8	(85.73)	300	(1.33)	.09	(.04)
2 (50)	3/8	2 7/16	(61.91)	1 3/8	(34.93)	3 5/16	(84.14)	4 3/8	(111.13)	300	(1.33)	.11	(.05)
2 1/2 (65)	3/8	2 13/16	(71.44)	1 1/2	(38.10)	3 7/8	(98.43)	5 9/16	(141.29)	525	(2.34)	.26	(.12)
3 (80)	3/8	3 1/8	(79.38)	1 9/16	(39.69)	4 3/16	(106.36)	5 3/4	(146.05)	525	(2.34)	.28	(.13)
3 1/2 (90)	3/8	3 1/2	(88.90)	1 11/16	(42.86)	4 9/16	(115.89)	6 3/8	(161.93)	525	(2.34)	.33	(.15)
4 (100)	3/8	3 3/4	(95.25)	1 11/16	(42.86)	4 13/16	(122.24)	6 15/16	(176.21)	650	(2.89)	.33	(.15)
5 (125)	1/2	4 1/8	(104.78)	1 9/16	(39.69)	5 3/16	(131.76)	7 13/16	(198.44)	1000	(4.45)	.56	(.25)
6 (150)	1/2	4 5/8	(117.48)	1 9/16	(39.69)	5 11/16	(144.46)	8 15/16	(227.01)	1000	(4.45)	.65	(.29)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

BAND HANGERS

FIG. 145 & 155 ADJUSTABLE SWIVEL RING HANGER WITH SECURED INSULATION SHIELD



Function: Designed for the suspension of insulated pipe lines. Fig 145 is a combination of our Fig. 160 shield welded to a Fig. 141 hanger & the Fig 155 is a combination of our Fig. 160 shield welded to a Fig. 151 hanger, which ensures that the shield will be installed in conjunction with the hanger. Fig. 145 & 155 allows vertical adjustment after installation and offers maximum protection from crushing of the insulation by the hanger.

Material: Carbon steel

Finish: Pre-galvanized

Ordering: Specify figure number and size.

NOTE: All shields furnished with flared ends. To determine proper size consult shield selection guide.

Size No.	Rod Size A		Shield I.D.		Shield Length		Shield Gauge	Hanger Size		Max Rec. Load				Wt. Each			
	145									155		145		155			
	145	155	lbs.	kN	lbs.	kN	lbs.	kg	lbs.	kg							
1	3/8	3/8	2 3/8 (60.33)	8 (203.2)	18	2 (50)	300 (1.33)	300 (1.33)	.55 (.25)	.55 (.25)							
2	3/8	1/2	2 5/8 (66.68)	8 (203.2)	18	2 1/2 (65)	525 (2.34)	600 (2.67)	.66 (.30)	.80 (.36)							
3	3/8	1/2	2 7/8 (73.03)	8 (203.2)	18	2 1/2 (65)	525 (2.34)	600 (2.67)	.7 (.32)	.84 (.38)							
4	3/8	1/2	3 1/2 (88.90)	8 (203.2)	18	3 (80)	525 (2.34)	600 (2.67)	.87 (.39)	.99 (.45)							
5	3/8	1/2	4 (101.60)	8 (203.2)	18	3 1/2 (90)	525 (2.34)	600 (2.67)	1 (.45)	1.12 (.51)							
6	3/8	5/8	4 1/2 (114.30)	8 (203.2)	18	4 (100)	650 (2.89)	1000 (4.45)	1.08 (.49)	1.26 (.57)							
7	1/2	5/8	5 (127.00)	8 (203.2)	18	5 (125)	1000 (4.45)	1000 (4.45)	1.51 (.68)	1.58 (.72)							
8	1/2	5/8	5 5/8 (142.88)	8 (203.2)	18	5 (125)	1000 (4.45)	1000 (4.45)	1.63 (.74)	1.70 (.77)							
9	1/2	3/4	6 (152.40)	8 (203.2)	18	6 (150)	1000 (4.45)	1250 (5.56)	1.72 (.78)	2.20 (1.00)							
10	1/2	3/4	6 5/8 (168.28)	8 (203.2)	18	6 (150)	1000 (4.45)	1250 (5.56)	1.87 (.85)	2.35 (1.07)							
11	1/2	3/4	7 5/8 (193.68)	12 (304.8)	18	8 (200)	1000 (4.45)	1250 (5.56)	2.98 (1.35)	3.40 (1.54)							
12	1/2	3/4	8 5/8 (219.08)	12 (304.8)	18	8 (200)	1000 (4.45)	1250 (5.56)	3.25 (1.47)	3.67 (1.66)							

FIG. 180, 180F, & 181

BAND HANGER

Function: Designed for the suspension of non-insulated stationary pipe lines. Fig. 180F has a layer of felt which separates the pipe from the hanger to reduce vibration and sound.

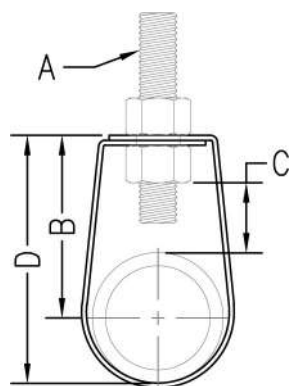
Material: Carbon steel (Type 304 or 316 Stainless Steel upon request)

Finish: Plain (**Fig. 180**), plain with felt (**Fig. 180F**), or electro-galvanized (**Fig. 181**)

Approvals: Complies with Federal Specifications A-A-1192A (Type 7) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 7). which supersedes ANSI/MSS SP-69.

Ordering: Specify figure number and pipe size.

NOTE: Use of an upper locknut ensures proper performance. If ordering felt lined hangers for 3 1/2" (90) pipe or less, order the next largest size to allow for the thickness of the felt lining.



Pipe Size		Rod Size	B		Adj. C		D		Max. Rec. Load		Wt. Each	
									lbs.	kN	lbs.	kg
1/2	(15)	3/8	2 1/4	(57.15)	1 3/8	(34.93)	2 11/16	(68.26)	610	(2.71)	.13	(.06)
3/4	(20)	3/8	2 1/8	(53.98)	1 1/8	(28.58)	2 11/16	(68.26)	610	(2.71)	.13	(.06)
1	(25)	3/8	2 1/8	(53.98)	1 1/16	(26.99)	2 13/16	(71.44)	610	(2.71)	.14	(.06)
1 1/4	(32)	3/8	2 5/16	(58.74)	1	(25.40)	3 3/16	(80.96)	610	(2.71)	.16	(.07)
1 1/2	(40)	3/8	2 7/16	(61.91)	1 1/16	(26.99)	3 7/16	(87.31)	610	(2.71)	.18	(.08)
2	(50)	3/8	2 7/8	(73.03)	1 3/16	(30.16)	4 1/16	(103.19)	610	(2.71)	.20	(.09)
2 1/2	(65)	1/2	3 1/8	(79.38)	7/8	(22.23)	4 7/16	(112.71)	970	(4.31)	.37	(.17)
3	(80)	1/2	3 3/4	(95.25)	1 3/8	(34.93)	5 1/2	(139.70)	970	(4.31)	.43	(.20)
3 1/2	(90)	1/2	3 7/8	(98.43)	1 1/4	(31.75)	5 7/8	(149.23)	970	(4.31)	.47	(.21)
4	(100)	1/2	4 1/4	(107.95)	1 3/8	(34.93)	6 1/2	(165.10)	1250	(5.56)	.69	(.31)
5	(125)	1/2	4 13/16	(122.24)	1 1/2	(38.10)	7 5/8	(193.68)	1250	(5.56)	.82	(.37)
6	(150)	3/4	5 15/16	(150.81)	1 11/16	(42.86)	9 1/4	(234.95)	1600	(7.12)	1.50	(.68)
8	(200)	3/4	7 15/16	(201.61)	2 1/2	(63.50)	12 1/4	(311.15)	1800	(8.01)	1.89	(.86)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

BAND HANGERS



COPPER TUBING BAND HANGER

FIG. 182

Function: Designed for the suspension of non-insulated stationary copper tubing. When proper adjustment has been obtained, the hanger should be locked in place with an upper locknut.

Material: Carbon steel

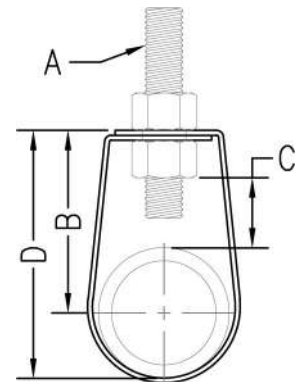
Finish: Copper color epoxy finish

Approvals: Complies with Federal Specifications A-A-1192A (Type 7) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 7) which supersedes ANSI/MSS SP-69.

Ordering: Specify figure number and pipe size.

NOTE: Use of an upper locknut ensures proper performance.

Tube Size		Rod Size	B		Adj. C		D		Max. Rec. Load		Wt. Each	
									lbs.	kN	lbs.	kg
1/2	(15)	3/8	2 ⁵ / ₁₆	(58.74)	1 ⁹ / ₁₆	(39.69)	2 ⁵ / ₈	(66.68)	610	(2.71)	.12	(.05)
3/4	(19)	3/8	2 ¹ / ₈	(53.98)	1 ¹ / ₄	(31.75)	2 ⁹ / ₁₆	(65.09)	610	(2.71)	.12	(.05)
1	(25)	3/8	2	(50.80)	1	(25.40)	2 ⁹ / ₁₆	(65.09)	610	(2.71)	.12	(.05)
1 ¹ / ₄	(32)	3/8	2 ¹ / ₁₆	(52.39)	1 ⁵ / ₁₆	(23.81)	2 ¹³ / ₁₆	(71.44)	610	(2.71)	.13	(.06)
1 ¹ / ₂	(40)	3/8	2 ⁵ / ₁₆	(58.74)	1 ¹ / ₁₆	(26.99)	3 ¹ / ₈	(79.38)	610	(2.71)	.14	(.06)
2	(50)	3/8	2 ⁵ / ₈	(66.68)	1 ¹ / ₈	(28.58)	3 ¹¹ / ₁₆	(93.66)	610	(2.71)	.16	(.07)
2 ¹ / ₂	(65)	1/2	3 ³ / ₁₆	(80.96)	1 ¹ / ₄	(31.75)	4 ¹ / ₂	(114.30)	610	(2.71)	.28	(.13)
3	(80)	1/2	3 ¹ / ₂	(88.90)	1 ⁵ / ₁₆	(33.34)	5	(127.00)	970	(4.31)	.35	(.16)
3 ¹ / ₂	(90)	1/2	3 ¹³ / ₁₆	(96.84)	1 ³ / ₈	(34.93)	5 ⁹ / ₁₆	(141.29)	970	(4.31)	.46	(.21)
4	(100)	1/2	4	(101.60)	1 ⁵ / ₁₆	(33.34)	6 ¹ / ₁₆	(153.99)	1130	(5.03)	.54	(.24)



TRH HANGING SYSTEM

FIG. TRH 2 - TRH 5

Function: Supports a pair of insulated flow and return refrigerant lines on 1/4" to 3/8" threaded rod. Simply fold the lock-tab over to secure the lines into the strap. The spring steel hanger grips the rod tightly, and the black zinc coating offers corrosion resistance while matching the insulation color. The clamp can be detached from the rod hanger and used to secure lines to flat surfaces.

Material: Spring Steel

Finish: Powder Coated

Ordering: Specify figure number.

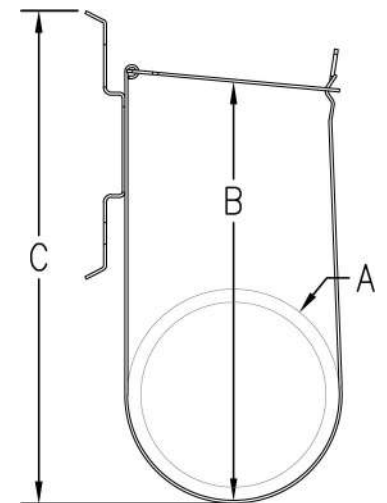
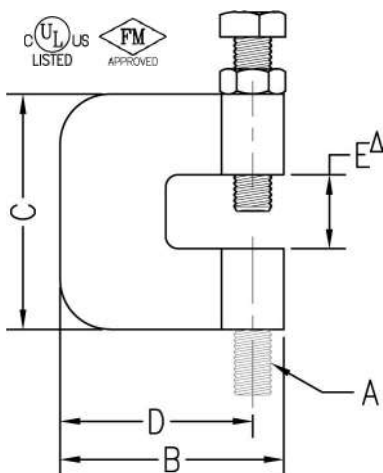


Fig. Number	Rod Size	A		B		C		Wt. Each	
								lbs.	kg
TRH 2	1/4 - 3/8	1.28	(32.51)	3.12	(79.25)	3.82	(97.03)	.148	(.07)
TRH 3	1/4 - 3/8	1.40	(35.56)	3.28	(83.31)	3.70	(93.98)	.152	(.07)
TRH 4	1/4 - 3/8	2.40	(60.96)	4.17	(105.92)	5.00	(127.00)	.209	(.09)
TRH 5	1/4 - 3/8	3.38	(85.85)	6.26	(159.00)	7.03	(178.56)	.316	(.14)

BEAM CLAMPS

FIG. 250

STEEL C-CLAMP WITH LOCKNUT



- Function:** Designed for attaching hanger rod to the bottom flange of a beam. The hanger rod should make contact with the beam flange to ensure full engagement.
- Material:** Carbon steel with hardened steel cup point set screw (Type 304 or 316 Stainless Steel upon request)
- Finish:** Plain or electro-galvanized
- Approvals:** Underwriters' Laboratories Listed in the U.S. (UL) and Canada (CUL) for $\frac{3}{8}$ " and $\frac{1}{2}$ " sizes only. Factory Mutual Approved for $\frac{3}{8}$ " rod size only. Complies with Federal Specifications A-A-1192A (Type 23) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 23) which supersedes ANSI/MSS SP-69. (Approvals are only for Fig. 250 with locknut).
- Ordering:** Specify figure number, rod size, material, and finish.

NOTE: When a torque wrench is unavailable, the setscrew should be tightened so it contacts the I-beam and then an additional $\frac{1}{4}$ to $\frac{1}{2}$ turn.

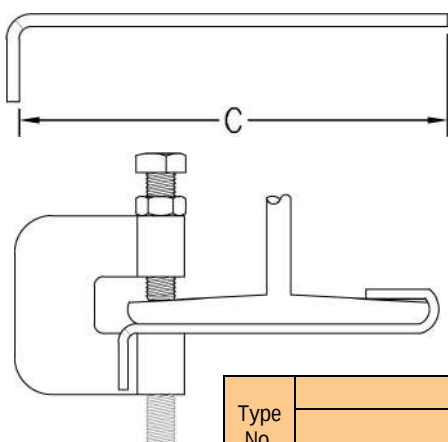
Set Screw Torque					Caution should be taken not to over tighten the set screw
Nominal Thread Size	$\frac{3}{8}$	$\frac{5}{8}$	$\frac{3}{4}$		
Rec. in-lbs.	60	250	400		
Rec. Torque N-m	(6.8)	(28.2)	(45.2)		

Rod Size A	B		C		D		E ^A		Max. Pipe Size		Max. Rec. Load		Wt. Each			
													w/o nut		with nut	
													lbs.	kg	lbs.	lbs.
$\frac{3}{8}$	$2\frac{1}{4}$	(57.15)	$2\frac{3}{8}$	(60.33)	$\frac{7}{8}$	(22.23)	$\frac{3}{4}$	(19.05)	4	(100)	400	(1.78)	.36	(.16)	.38	(.17)
$\frac{1}{2}$	$2\frac{1}{4}$	(57.15)	$2\frac{3}{8}$	(60.33)	$\frac{7}{8}$	(22.23)	$\frac{3}{4}$	(19.05)	4	(100)	500	(2.22)	.36	(.16)	.38	(.17)
$\frac{5}{8}$	$2\frac{3}{8}$	(60.33)	$2\frac{3}{8}$	(60.33)	$\frac{3}{4}$	(19.05)	$\frac{3}{4}$	(19.05)	5	(125)	550	(2.45)	.63	(.29)	.68	(.31)
$\frac{3}{4}$	$2\frac{1}{4}$	(57.15)	$2\frac{3}{8}$	(60.33)	$\frac{3}{4}$	(19.05)	$\frac{3}{4}$	(19.05)	6	(150)	600	(2.67)	.72	(.33)	.79	(.36)
$\frac{7}{8}$	$3\frac{1}{4}$	(57.15)	3	(76.20)	$1\frac{1}{4}$	(31.75)	1	(25.40)	8	(200)	900	(4.00)	1.65	(.75)	1.83	(.83)

^A Reduced by $\frac{1}{8}$ " (3.18mm) when used in conjunction with Fig. 259 retaining strap.

FIG. 259

RETAINING STRAP (For Fig. 250 & 270)



- Function:** Designed for use with Fig. 250 and 270 to eliminate possible movement of the beam clamp due to vibration.
- Material:** Carbon steel (Type 304 or 316 Stainless Steel upon request)
- Finish:** Plain or electro-galvanized
- Ordering:** Specify figure number, type number, length, material, and finish.

NOTE: 1" (25.4) should be added to beam flange width to determine length.

Type No.	Wt. Each											
	Length C											
	$4\frac{1}{2}$ (114.3)	6 (152.4)	8 (203.2)	10 (254.0)	12 (304.8)	14 (355.6)						
1	.15 (3.81)	.22 (5.59)	.33 (8.38)	.36 (9.14)	.43 (10.92)	.50 (12.70)						
2	.21 (5.33)	.28 (7.11)	.36 (9.14)	.45 (11.43)	.52 (13.21)	.59 (14.99)						

Type No. Selection Chart		
Size	Model No.	
	250	270
$\frac{3}{8}$	1	2
$\frac{1}{2}$	1	2
$\frac{5}{8}$	1	2
$\frac{3}{4}$	1	2

BEAM CLAMPS



MALLEABLE IRON C-CLAMP

FIG. 270

Function: Designed for attaching hanger rod to the bottom flange of a beam. The hanger rod should make contact with the beam flange to ensure full engagement.

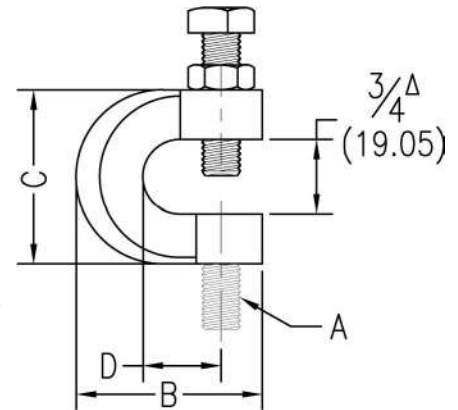
Material: Malleable iron with hardened steel cup point set screw and locknut

Finish: Plain or electro-galvanized

Approvals: Complies with Federal Specifications A-A-1192A (Type 23) and Manufacturers' Standardization Society ANSI/MSS SPSP-58 (Type 23) which supersedes ANSI/MSS SP-69.

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

NOTE: When a torque wrench is unavailable, the setscrew should be tightened so it contacts the I-beam and then an additional $\frac{1}{4}$ to $\frac{1}{2}$ turn.



Set Screw Torque				Caution should be taken not to over tighten the set screw
Nominal Thread Size	$\frac{3}{8}$	$\frac{1}{2}$		
Rec. Torque	in-lbs.	60	125	
	N-m	(6.8)	(14.1)	

Rod Size A	B		C		D		Max. Pipe Size		Max. Rec. Load		Wt. Each	
									lbs.	kN	lbs.	kg
$\frac{3}{8}$	$1\frac{3}{4}$	(44.45)	$1\frac{3}{4}$	(44.45)	$\frac{5}{8}$	(15.88)	2	(50)	400	(1.78)	.33	(.15)
$\frac{1}{2}$	$1\frac{3}{4}$	(44.45)	$1\frac{3}{4}$	(44.45)	$\frac{5}{8}$	(15.88)	$3\frac{1}{2}$	(90)	400	(1.78)	.39	(.18)
$\frac{5}{8}$	2	(50.80)	2	(50.80)	$\frac{3}{4}$	(19.05)	5	(125)	440	(1.96)	.46	(.21)
$\frac{3}{4}$	2	(50.80)	2	(50.80)	$\frac{3}{4}$	(19.05)	6	(150)	500	(2.22)	.52	(.24)

Δ Reduced by $\frac{1}{8}$ " (3.18mm) when used in conjunction with Fig. 259 retaining strap.

PURLIN CLAMP

FIG. 290

Function: Designed for use with large-lip rolled steel purlins to eliminate the need to modify steel purlin for standard C-clamp.

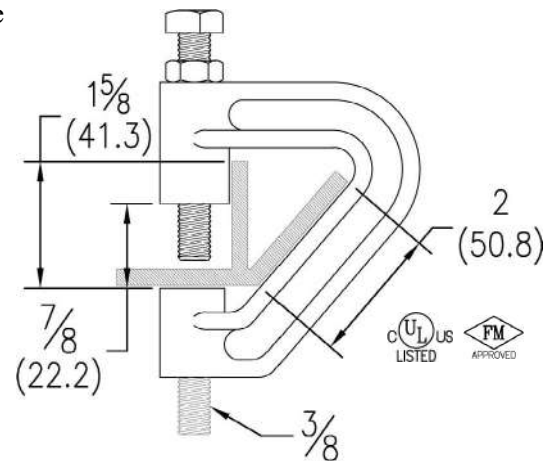
Material: Malleable iron with hardened steel cup point set screw and locknut

Finish: Plain or electro-galvanized

Approvals: Underwriters' Laboratories Listed in the U.S. (UL) and Canada (CUL), and Factory Mutual Approved. Complies with Federal Specifications A-A-1192A (Type 23) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 23) which supersedes ANSI/MSS SP-69.

Ordering: Specify figure number and finish.

NOTE: When a torque wrench is unavailable, the setscrew should be tightened so it contacts the I-beam and then an additional $\frac{1}{4}$ to $\frac{1}{2}$ turn.



Set Screw Torque				Caution should be taken not to over tighten the set screw
Nominal Thread Size	$\frac{3}{8}$			
Rec. Torque	in-lbs.	60		
	N-m	(6.8)		

Rod Size	Max. Pipe Size		Max. Rec. Load		Wt. Each	
			lbs.	kN	lbs.	kg
$\frac{3}{8}$	4	(100)	400	(1.78)	.82	(.37)

BEAM CLAMPS

FIG. 345

TOP BEAM CLAMP

- Function:** Designed for attaching hanger rod to the top flange of a beam or bar joist where the flange thickness does not exceed $\frac{3}{4}$ " (19.05mm). The open U design permits rod adjustment.
- Material:** Carbon steel with hardened steel cup point set screw and locknut
- Finish:** Pre-galvanized
- Approvals:** Underwriters' Laboratories Listed in the U.S. (UL), Canada (CUL) and Factory Mutual Approved. Complies with Federal Specifications A-A-1192A (Type 19) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 19) which supersedes ANSI/MSS SP-69.
- Ordering:** Specify figure number.

NOTE: When a torque wrench is unavailable, the setscrew should be tightened so it contacts the I-beam and then an additional $\frac{1}{4}$ to $\frac{1}{2}$ turn. Set screw must contact the sloped side of the I-beam, channel, or other applicable building structure. Clamp must always be installed in top orientation, with the arrow mark on clamp pointing up. The following illustration displays the only acceptable installation positions. On parallel flange surfaces, the clamp may be attached to the upper or lower flange but must be in the top orientation as shown.

Set Screw Torque			Caution should be taken not to over tighten the set screw
Nominal Thread Size		3/8	
Rec. Torque	in-lbs. N-m	60 (6.8)	

Rod Size A	B		C		D		E		Max. Pipe Size		Max. Rec. Load		Wt. Each	
											lbs.	kN	lbs.	lbs.
$\frac{3}{8}$	$\frac{3}{4}$	(19.05)	$1\frac{9}{16}$	(39.69)	$1\frac{1}{2}$	(38.10)	$\frac{9}{16}$	(14.29)	4	(100)	610	(2.71)	.20	(.09)

FIG. 358

RETROFIT RETAINING STRAP

- Function:** Designed for use with Fig. 345, Fig. 350, and Fig. 360 to offer more secure fastening of beam clamps to beam where seismic protection is provided.
- Material:** Carbon steel (Type 304 or 316 Stainless Steel upon request)
- Finish:** Pre-galvanized
- Approvals:** Underwriters' Laboratories Listed in the U.S. (UL) and Canada (CUL) for $\frac{3}{8}$ " and $\frac{1}{2}$ " rod sizes only. Meets NFPA13 requirements for hangers and fasteners subject to earthquakes.
- Ordering:** Specify figure number, length, rod size, and material.

NOTE: Use jam nut over hanger rod to secure retaining strap. 2 inches (50.8) should be added to beam flange width to determine length.

Rod Size	Wt. Each													
	Length C													
	$4\frac{1}{2}$ (114.3)	6 (152.4)	8 (203.2)	10 (254.0)	12 (304.8)	14 (355.6)	*16 (406.4)	*18 (457.2)						
$\frac{3}{8}$	.06 (.027)	.08 (.036)	.11 (.050)	.14 (.064)	.17 (.077)	.21 (.095)	.32 (.145)	.35 (.159)						
$\frac{1}{2}$	.06 (.027)	.08 (.036)	.11 (.050)	.14 (.064)	.17 (.077)	.20 (.091)	.32 (.145)	.35 (.159)						

* Size Not UL Listed

BEAM CLAMPS



RETAINING STRAP (For Fig. 345, 350 & 360)

Function: Designed for use with Fig. 345, Fig. 350, and Fig. 360 to offer more secure fastening of beam clamps to beam where seismic protection is provided.

Material: Carbon steel (Type 304 or 316 Stainless Steel upon request)

Finish: Pre-galvanized

Approvals: Underwriters' Laboratories Listed in the U.S. (UL) and Canada (CUL) for $\frac{3}{8}$ " and $\frac{1}{2}$ " rod sizes only. Meets NFPA13 requirements for hangers and fasteners subject to earthquakes.

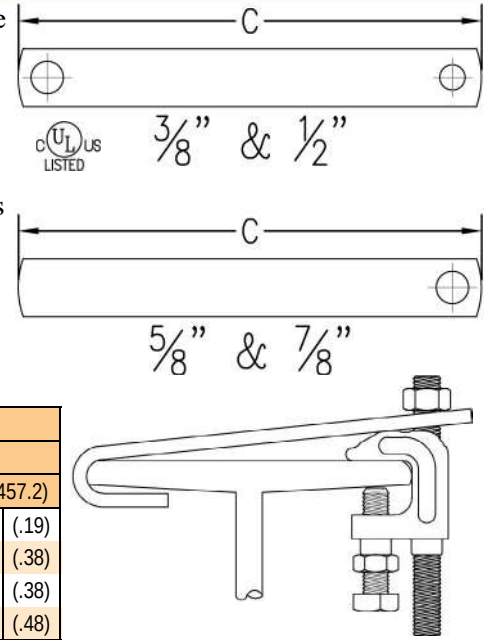
Ordering: Specify figure number, length, rod size, and material.

NOTE: Use jam nut over hanger rod to secure retaining strap. 2 inches (50.8) should be added to beam flange width to determine length.

Rod Size	Wt. Each															
	Length C															
	4 1/2 (114.3)	6 (152.4)	8 (203.2)	10 (254.0)	12 (304.8)	14 (355.6)	*16 (406.4)	*18 (457.2)								
3/8 & 1/2	.09 (.04)	.12 (.05)	.15 (.07)	.21 (.10)	.22 (.10)	.29 (.13)	.38 (.17)	.42 (.19)	.09 (.04)	.12 (.05)	.15 (.07)	.21 (.10)	.22 (.10)	.29 (.13)	.38 (.17)	.42 (.19)
* 5/8	.19 (.09)	.25 (.11)	.34 (.15)	.42 (.19)	.50 (.23)	.59 (.27)	.74 (.33)	.83 (.38)	.19 (.09)	.25 (.11)	.34 (.15)	.42 (.19)	.50 (.23)	.59 (.27)	.74 (.33)	.83 (.38)
* 3/4	.19 (.09)	.25 (.11)	.33 (.15)	.41 (.19)	.49 (.22)	.57 (.26)	.74 (.33)	.83 (.38)	.19 (.09)	.25 (.11)	.33 (.15)	.41 (.19)	.49 (.22)	.57 (.26)	.74 (.33)	.83 (.38)
* 7/8	.28 (.23)	.37 (.17)	.50 (.23)	.62 (.28)	.75 (.34)	.87 (.39)	.94 (.43)	1.05 (.48)	.28 (.23)	.37 (.17)	.50 (.23)	.62 (.28)	.75 (.34)	.87 (.39)	.94 (.43)	1.05 (.48)

* Size Not UL Listed

FIG. 359



IMPORT BEAM CLAMP

Function: Designed for attaching hanger rod to the top flange of a beam or bar joist, where the flange thickness does not exceed $\frac{3}{4}$ inch (19.05mm). The open U design permits rod adjustment.

Material: Malleable iron with hardened steel cup point set screw and locknut (Type 304 or 316 Stainless Steel upon request for $\frac{1}{4}$ ", $\frac{3}{8}$ ", and $\frac{1}{2}$ " only)

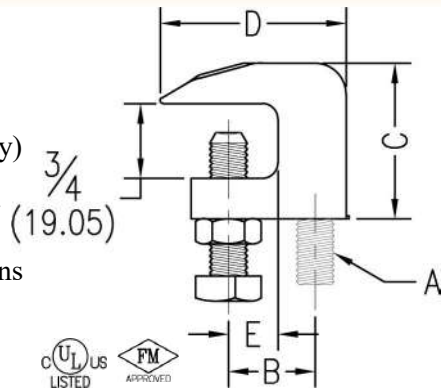
Finish: Plain or electro-galvanized

Approvals: Underwriters' Laboratories Listed in the U.S. (UL), Canada (CUL), for sizes $\frac{3}{8}$ " to $\frac{7}{8}$ " malleable iron only. Factory Mutual Approved for rod size $\frac{3}{8}$ " & $\frac{1}{2}$ " malleable iron only. Complies with Federal Specifications A-A-1192A (Type 19) and Manufacturers' Standardization Society ANSI/MSS SPSP-58 (Type 19) which supersedes ANSI/MSS SP-69. (Approvals are only valid for beam clamps with locknut).

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

NOTE: When a torque wrench is unavailable, the setscrew should be tightened so it contacts the I-beam and then an additional $\frac{1}{4}$ to $\frac{1}{2}$ turn.

FIG. 350



Set Screw Torque				Caution should be taken not to over tighten the set screw
Nominal Thread Size	3/8	1/2		
Rec. Torque	in-lbs. 60 N-m (6.8)	125 (14.1)		

Rod Size A	B		C		D		E		Max. Pipe Size		Max. Rec. Load		Wt. Each	
											lbs.	kN	lbs.	kg
* 1/4	7/8	(22.23)	1 1/2	(38.10)	1 5/8	(41.28)	1/2	(12.70)	N/A	N/A	250	(1.11)	.34	(.15)
Δ 3/8	7/8	(22.23)	1 1/2	(38.10)	1 5/8	(41.28)	1/2	(12.70)	4	(100)	400	(1.78)	.33	(.15)
1/2	1	(25.40)	1 1/2	(38.10)	1 11/16	(42.86)	1/2	(12.70)	8	(200)	500	(2.22)	.34	(.15)
5/8	1 1/16	(26.99)	1 1/2	(38.10)	1 7/8	(47.63)	5/8	(15.88)	8	(200)	600	(2.67)	.39	(.18)
3/4	1 5/16	(33.34)	1 3/4	(44.45)	2 3/8	(60.33)	5/8	(15.88)	8	(200)	800	(3.56)	.63	(.29)
7/8	1 5/16	(33.34)	1 3/4	(44.45)	2 3/8	(60.33)	5/8	(15.88)	8	(200)	1200	(5.34)	.60	(.27)

* 1/4" Not UL or FM approved. Available in type 304 or 316 stainless steel only. For non stainless steel 1/4" rod sizes, see Fig. 350 - 1/4" Malleable Domestic Beam Clamp.

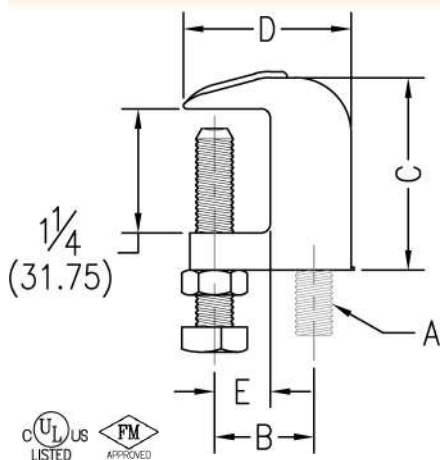
Δ 3/8" Fig. 350 Reversible design approved for bottom beam use.

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

BEAM CLAMPS

FIG. 360

IMPORT WIDE MOUTH BEAM CLAMP



- Function:** Designed for attaching hanger rod to the top flange of a beam or bar joist, where the flange thickness does not exceed 1 1/4" (31.75mm). The open U design permits rod adjustment.
- Material:** Malleable iron with hardened steel cup point set screw and locknut
- Finish:** Plain or electro-galvanized
- Approvals:** Underwriters' Laboratories Listed in the U.S. (UL), Canada (CUL), and Factory Mutual Approved for rod sizes 3/8" and 1/2" only. Complies with Federal Specifications A-A-1192A (Type 19) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 19) which supersedes ANSI/MSS SP-69. (Approvals are only valid for beam clamps with locknut).
- Ordering:** Specify figure number, rod size, and finish.

NOTE: When a torque wrench is unavailable, the setscrew should be tightened so it contacts the I-beam and then an additional 1/4 to 1/2 turn.

Set Screw Torque			Caution should be taken not to over tighten the set screw
Nominal Thread Size		3/8	
Rec. Torque	in-lbs.	60	
	N-m	(6.8)	

Rod Size A	B		C		D		E		Max. Pipe Size		Max. Rec. Load		Wt. Each	
											lbs.	kN	lbs.	kg
3/8	1	(25.40)	1 7/8	(47.63)	1 5/8	(41.28)	1/2	(12.70)	4	(100)	400	(1.78)	.37	(.17)
1/2	1	(25.40)	1 7/8	(47.63)	1 5/8	(41.28)	1/2	(12.70)	8	(200)	500	(2.22)	.35	(.16)
5/8	1 3/8	(34.93)	2 5/16	(58.74)	2 1/4	(57.15)	3/4	(19.05)	8	(200)	850	(3.78)	.74	(.34)
3/4	1 1/2	(38.10)	2 3/8	(60.33)	2 3/8	(60.33)	3/4	(19.05)	8	(200)	900	(4.00)	.87	(.39)

BEAM CLAMPS



DOMESTIC BEAM CLAMP

FIG. 350, 353, 354, 355, 356, & 357

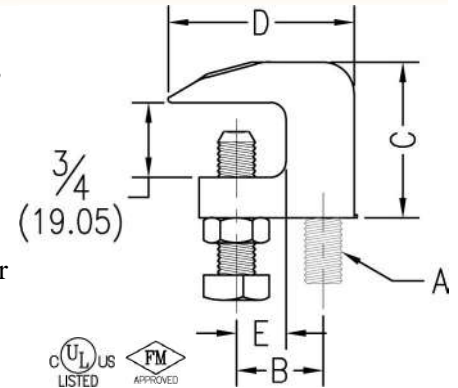
Function: Designed for attaching hanger rod to the top flange of a beam or bar joist, where the flange thickness does not exceed $\frac{3}{4}$ " (19.05mm). The open U design permits rod adjustment. The universal design of the $\frac{3}{8}$ " Fig. 353 allows it to be used in an inverted position on the bottom flange of a beam as well.

Material: Malleable iron with hardened steel cup point set screw and locknut
Finish: Plain or electro-galvanized (Hot dipped galvanized with electro-galvanized hardware upon request)

Approvals: Underwriters' Laboratories Listed in the U.S. (UL), Canada (CUL), for sizes $\frac{3}{8}$ " to $\frac{7}{8}$ " only. Factory Mutual Approved for rod sizes $\frac{3}{8}$ " and $\frac{1}{2}$ " only. Complies with Federal Specifications A-A-1192A (Type 19) and Manufacturers' Standardization Society ANSI/MSS SPSP-58 (Type 19) which supersedes ANSI/MSS SP-69. Fig. 353 sized for $\frac{3}{8}$ " rod can be used in an inverted position (bottom of beam) and follows the same U.S. (UL), Canada (CUL), and Factory Mutual Approvals. Used in this manner the $\frac{3}{8}$ " Fig. 353 also complies with Federal Specifications A-A-1192A (Type 23) and Manufacturers' Standardization Society ANSI/MSS SPSP-58 (Type 23) which supersedes ANSI/MSS SP-69. (Approvals are only valid for beam clamps with locknut). Buy American Act compliant

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

NOTE: When a torque wrench is unavailable, the setscrew should be tightened so it contacts the I-beam and then an additional $\frac{1}{4}$ to $\frac{1}{2}$ turn.



Set Screw Torque				Caution should be taken not to over tighten the set screw
Nominal Thread Size		$\frac{3}{8}$	$\frac{1}{2}$	
Rec. Torque	in-lbs.	60	125	
	N-m	(6.8)	(14.1)	

Figure Numbers	Rod Size A	B		C		D		E		Max. Pipe Size		Max. Rec. Load		Wt. Each	
												lbs.	kN	lbs.	kg
* 350	$\frac{1}{4}$	$\frac{7}{8}$	(22.23)	$1\frac{1}{2}$	(38.10)	$1\frac{5}{8}$	(41.28)	$\frac{1}{2}$	(12.70)	N/A	N/A	250	(1.11)	.34	(.15)
Δ 353	$\frac{3}{8}$	$\frac{7}{8}$	(22.23)	$1\frac{1}{2}$	(38.10)	$1\frac{5}{8}$	(41.28)	$\frac{1}{2}$	(12.70)	4	(100)	400	(1.78)	.33	(.15)
354	$\frac{1}{2}$	1	(25.40)	$1\frac{1}{2}$	(38.10)	$1\frac{11}{16}$	(42.86)	$\frac{1}{2}$	(12.70)	8	(200)	500	(2.22)	.34	(.15)
355	$\frac{5}{8}$	$1\frac{1}{16}$	(26.99)	$1\frac{1}{2}$	(38.10)	$1\frac{7}{8}$	(47.63)	$\frac{5}{8}$	(15.88)	8	(200)	600	(2.67)	.39	(.18)
356	$\frac{3}{4}$	$1\frac{5}{16}$	(33.34)	$1\frac{3}{4}$	(44.45)	$2\frac{3}{8}$	(60.33)	$\frac{5}{8}$	(15.88)	8	(200)	800	(3.56)	.63	(.29)
357	$\frac{7}{8}$	$1\frac{5}{16}$	(33.34)	$1\frac{3}{4}$	(44.45)	$2\frac{3}{8}$	(60.33)	$\frac{5}{8}$	(15.88)	8	(200)	1200	(5.34)	.60	(.27)

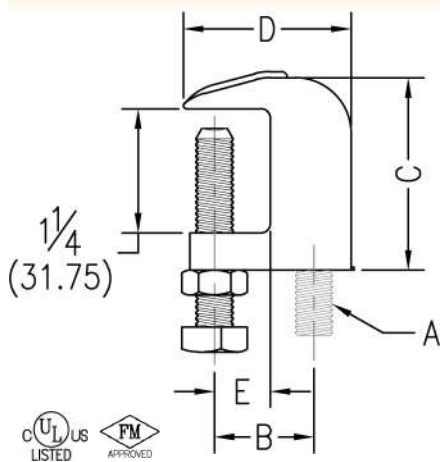
* $\frac{1}{4}$ " Fig. 350 Not UL or FM approved.

Δ $\frac{3}{8}$ " Fig. 353 Reversible design approved for bottom beam use.

BEAM CLAMPS

FIG. 363 & 364

DOMESTIC WIDE MOUTH BEAM CLAMP



- Function:** Designed for attaching hanger rod to the top flange of a beam or bar joist, where the flange thickness does not exceed 1 1/4" (31.75mm). The open U design permits rod adjustment.
- Material:** Malleable iron with hardened steel cup point set screw and locknut
- Finish:** Plain or electro-galvanized (Hot dipped galvanized with electro-galvanized hardware upon request)
- Approvals:** Underwriters' Laboratories Listed in the U.S. (UL), Canada (CUL), and Factory Mutual Approved for rod sizes. Complies with Federal Specifications A-A-1192A (Type 19) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 19) which supersedes ANSI/MSS SP-69. (Approvals are only valid for beam clamps with locknut). Buy American Act compliant
- Ordering:** Specify figure number, rod size, and finish.

NOTE: When a torque wrench is unavailable, the setscrew should be tightened so it contacts the I-beam and then an additional 1/4 to 1/2 turn.

Set Screw Torque			Caution should be taken not to over tighten the set screw
Nominal Thread Size		3/8	
Rec. Torque	in-lbs.	60	
	N-m	(6.8)	

Figure Numbers	Rod Size A	B		C		D		E		Max. Pipe Size		Max. Rec. Load		Wt. Each	
												lbs.	kN	lbs.	kg
363	3/8	1	(25.40)	1 7/8	(47.63)	1 5/8	(41.28)	1/2	(12.70)	4	(100)	400	(1.78)	.37	(.17)
364	1/2	1	(25.40)	1 7/8	(47.63)	1 5/8	(41.28)	1/2	(12.70)	8	(200)	500	(2.22)	.35	(.16)

CLEVIS HANGERS

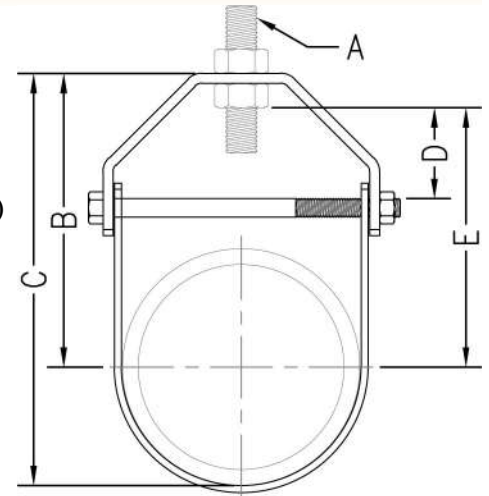


A.W.W.A CLEVIS HANGER

FIG. 420

- Function:** Designed for the suspension of stationary (A.W.W.A.) ductile iron and cast iron pipe.
- Material:** Carbon steel (Type 304 or 316 Stainless Steel upon request)
- Finish:** Plain or electro-galvanized (Hot dipped galvanized with electro-galvanized hardware upon request)
- Approvals:** Complies with Federal Specifications A-A-1192A (Type 1) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 1) which supersedes ANSI/MSS SP-69.
- Ordering:** Specify figure number, A.W.W.A. pipe size, material, and finish.

NOTE: Use of an upper locknut ensures proper performance. For sizes of 10" (250) and larger, a pipe spacer is added over the cross bolt.



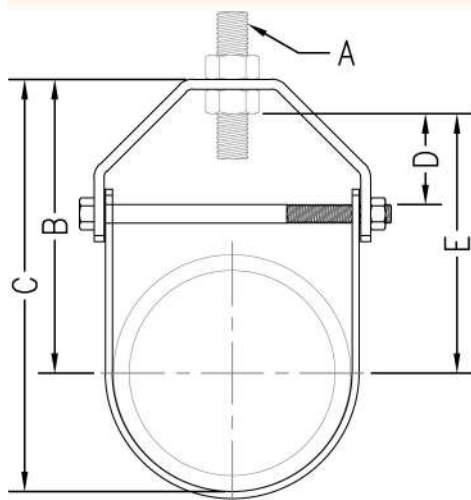
A.W.W.A. Pipe Size		Pipe O.D.		Rod Size A	B		C		Adjustment D		E		Cross Bolt	Max. Rec. Load		Wt. Each	
														lbs.	kN	lbs.	kg
3	(80)	3.96	(100.58)	1/2	4 1/2	(114.30)	6 1/2	(165.10)	1 1/4	(31.75)	3 7/8	(98.43)	3/8	1350	(6.01)	1.22	(.55)
4	(100)	4.80	(121.92)	5/8	5 3/4	(146.05)	8 1/8	(206.38)	1 3/8	(34.93)	4 5/8	(117.48)	3/8	1430	(6.36)	2.08	(.94)
6	(150)	6.90	(175.26)	3/4	6 15/16	(176.21)	10 3/8	(263.53)	1 3/8	(34.93)	5 5/8	(142.88)	1/2	1940	(8.63)	2.78	(1.26)
8	(200)	9.05	(229.87)	3/4	9 1/4	(234.95)	13 3/4	(349.25)	2 1/2	(63.50)	7 7/8	(200.03)	5/8	2000	(8.90)	4.47	(2.03)
10	(250)	11.10	(281.94)	7/8	11 1/8	(282.58)	16 5/8	(422.28)	2 1/2	(63.50)	9 5/8	(244.48)	3/4	3600	(16.01)	8.87	(4.02)
12	(300)	13.20	(335.28)	7/8	12 5/8	(320.68)	19 1/4	(488.95)	2 7/8	(73.03)	11 1/8	(282.58)	3/4	3800	(16.90)	12.03	(5.46)
14	(350)	15.30	(388.62)	1	14 1/8	(358.78)	21 3/4	(552.45)	3 1/8	(79.38)	12 3/8	(314.33)	7/8	4200	(18.68)	15.15	(6.87)
16	(400)	17.40	(441.96)	1	14 7/8	(377.83)	23 5/8	(600.08)	2 3/4	(69.85)	13 1/8	(333.38)	1	4600	(20.46)	23.61	(10.71)
18	(450)	19.50	(495.30)	1	16 1/2	(419.10)	26 1/4	(666.75)	3 1/4	(82.55)	14 5/8	(371.48)	1 1/8	4800	(21.35)	25.90	(11.75)
20	(500)	21.60	(548.64)	1 1/4	18 11/16	(474.66)	29 1/2	(749.30)	3 5/8	(92.08)	16 13/16	(427.04)	1 1/4	4800	(21.35)	44.30	(20.09)
24	(600)	25.80	(655.32)	1 1/4	21 13/16	(554.04)	34 3/4	(882.65)	4 5/8	(117.48)	19 15/16	(506.41)	1 1/4	4800	(21.35)	52.45	(23.79)
30	(750)	32.00	(812.80)	1 1/4	33 1/2	(850.90)	46 1/2	(1181.10)	6 1/2	(165.10)	30 3/8	(771.53)	1 1/4	4800	(21.35)	76.90	(34.88)
36	(900)	38.30	(972.82)	1 1/2	38 1/8	(968.38)	53 1/4	(1352.55)	7 1/4	(184.15)	31 1/4	(793.75)	1 1/2	7000	(31.14)	202.00	(91.63)

Adjustment "D" (Top of cross bolt to bottom of hanger rod nut.)

CLEVIS HANGERS

FIG. 425 & 426

STAINLESS STEEL CLEVIS HANGER



Function: Designed for the suspension of non-insulated stationary pipe lines in applications where protection from corrosive environments is desired. Frequently specified for areas requiring the ultimate in sanitation. Another benefit includes a reduction of long term maintenance costs, due to the corrosive resistant properties of stainless steel.

Material: Type 304 stainless steel (**Fig. 425**) or type 316 stainless steel (**Fig. 426**)

Finish: Plain

Approvals: Complies with Federal Specification A-A-1192A (Type 1) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 1) which supersedes ANSI/MSS SP-69.

Ordering: Specify figure number and pipe size.

NOTE: Use of an upper locknut ensures proper performance. Pipe spacers provided on 30" (750mm) and larger clevises. When an over-sized clevis is used, a pipe spacer should be placed over the clevis bolt to prevent the lower U-strap from moving inward.

Pipe Size		Rod Size A	B		C		Adjustment D		E		Cross Bolt	Max. Rec. Load		Wt. Each	
												lbs.	kN	lbs.	kg
1/2	(15)	3/8	27/16	(61.9)	27/8	(73.0)	1 1/8	(28.6)	2	(50.8)	1/4	730	(3.25)	0.24	(0.11)
3/4	(20)	3/8	25/8	(66.7)	3 1/8	(79.4)	1 1/4	(31.8)	2 3/16	(55.6)	1/4	730	(3.25)	0.24	(0.11)
1	(25)	3/8	3 1/16	(77.8)	3 3/4	(95.3)	1 5/8	(41.3)	2 5/8	(66.7)	1/4	730	(3.25)	0.28	(0.13)
1 1/4	(32)	3/8	3 3/8	(85.7)	4 3/16	(106.4)	1 5/8	(41.3)	2 15/16	(74.6)	1/4	730	(3.25)	0.32	(0.15)
1 1/2	(40)	3/8	3 1/2	(88.9)	4 7/16	(112.7)	1 1/2	(38.1)	3 1/16	(77.8)	1/4	730	(3.25)	0.40	(0.18)
2	(50)	3/8	3 3/4	(95.3)	5	(127.0)	1 5/8	(41.3)	3 5/16	(84.1)	1/4	730	(3.25)	0.52	(0.24)
2 1/2	(65)	1/2	4 5/8	(117.5)	6 1/16	(154.0)	2	(50.8)	4 1/16	(103.2)	3/8	1350	(6.01)	0.72	(0.33)
3	(80)	1/2	4 7/8	(123.8)	6 5/8	(168.3)	1 13/16	(46.0)	4 1/4	(108.0)	3/8	1350	(6.01)	0.78	(0.35)
3 1/2	(90)	1/2	4 1/2	(114.3)	6 1/2	(165.1)	1 1/4	(31.8)	3 7/8	(98.4)	3/8	1350	(6.01)	1.16	(0.53)
4	(100)	5/8	5 1/2	(139.7)	7 11/16	(195.3)	1 3/4	(44.5)	4 11/16	(119.1)	3/8	1430	(6.36)	1.35	(0.61)
5	(125)	5/8	6 1/8	(155.6)	9 1/8	(231.8)	1 7/8	(47.6)	5 5/16	(134.9)	1/2	1430	(6.36)	1.88	(0.85)
6	(150)	3/4	6 7/8	(174.6)	10 1/8	(257.2)	1 5/8	(41.3)	6	(152.4)	1/2	1940	(8.63)	2.76	(1.25)
8	(200)	3/4	8 3/4	(222.3)	12 7/8	(327.0)	2 1/8	(54.0)	7 7/8	(200.0)	5/8	2000	(8.90)	4.35	(1.97)
10	(250)	7/8	10 3/8	(263.5)	15 3/4	(400.1)	2 3/8	(60.3)	9 1/8	(231.8)	3/4	3600	(16.01)	8.22	(3.73)
12	(300)	7/8	11 5/8	(295.3)	18	(457.2)	2 1/2	(63.5)	10 1/2	(266.7)	3/4	3800	(16.90)	10.05	(4.56)
14	(350)	1	12 3/4	(323.9)	19 3/4	(501.7)	2 5/8	(66.7)	11 1/4	(285.8)	7/8	4200	(18.68)	12.97	(5.88)
16	(400)	1	14 1/8	(358.8)	22 1/8	(562)	2 5/8	(66.7)	13 5/8	(346.1)	1	4600	(20.46)	20.85	(9.46)
18	(450)	1	16 1/2	(419.1)	25 1/2	(647.7)	3 1/2	(88.9)	15	(381.0)	1 1/8	4800	(21.35)	24.75	(11.23)
20	(500)	1 1/4	18	(457.2)	28	(711.2)	4 1/8	(104.8)	16 1/8	(409.6)	1 1/4	4800	(21.35)	42.45	(19.26)
24	(600)	1 1/4	20 1/4	(514.4)	32 1/4	(819.2)	4 3/4	(120.7)	18 3/8	(466.7)	1 1/4	4800	(21.35)	48.65	(22.07)
30	(750)	1 1/4	24 1/2	(622.3)	38 7/8	(987.4)	5 1/2	(139.7)	21 1/2	(546.1)	1 1/4	6000	(26.69)	69.83	(31.67)
36	(900)	1 1/2	32	(812.8)	50	(1270.0)	8 3/4	(222.3)	30	(762.0)	1 1/2	9500	(42.26)	175.00	(79.38)

Adjustment "D" (Top of cross bolt to bottom of hanger rod nut.)

CLEVIS HANGERS

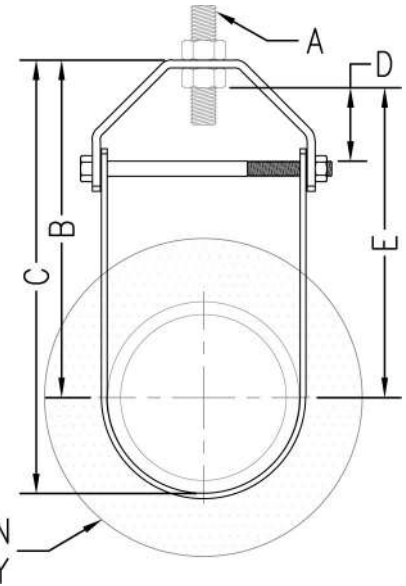


CLEVIS HANGER FOR INSULATED PIPE LINES

FIG. 430

- Function:** Designed for the suspension of insulated stationary pipe lines. The elongated design permits the insulation to encompass the hanger, while maintaining a clearance between the insulation and the cross bolt. This allows the installation of the insulation to be more economical due to the fact that less cutting and fitting is required.
- Material:** Carbon steel (Type 304 or 316 Stainless Steel upon request)
- Finish:** Plain or electro-galvanized (Hot dipped galvanized with electro-galvanized hardware upon request)
- Approvals:** Complies with Federal Specifications A-A-1192A (Type 1) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 1) which supersedes ANSI/MSS SP-69.
- Ordering:** Specify figure number, pipe size, material, and finish.

NOTE: Use of an upper locknut ensures proper performance.



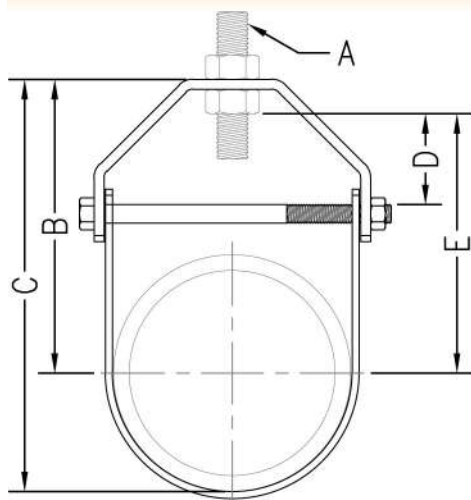
Pipe Size		Rod Size A	B		C		Adjustment D		E		Cross Bolt	Max. Insulation Thickness		Wt. Each			
														lbs.	kN	lbs.	kg
1/2	(15)	3/8	3 3/4	(95.25)	4 1/4	(107.95)	9/16	(14.29)	3 7/16	(87.31)	1/4	2	(50.8)	730	(3.25)	.47	(.21)
3/4	(20)	3/8	4 1/4	(107.95)	4 7/8	(123.83)	5/8	(15.88)	3 7/8	(98.43)	1/4	2	(50.8)	730	(3.25)	.48	(.22)
1	(25)	3/8	5 1/8	(130.18)	5 3/4	(146.05)	1 5/8	(41.28)	4 11/16	(119.06)	1/4	2	(50.8)	730	(3.25)	.55	(.25)
1 1/4	(32)	3/8	5 5/16	(134.94)	6 1/8	(155.58)	1 5/8	(41.28)	4 7/8	(123.83)	1/4	2	(50.8)	730	(3.25)	.56	(.25)
1 1/2	(40)	3/8	5 7/16	(138.11)	6 3/8	(161.93)	1 1/2	(38.10)	5	(127.00)	1/4	2	(50.8)	730	(3.25)	.61	(.28)
2	(50)	3/8	7 9/16	(192.09)	8 3/4	(222.25)	1 5/8	(41.28)	7 1/8	(180.98)	1/4	4	(101.6)	730	(3.25)	.84	(.38)
2 1/2	(65)	1/2	7 13/16	(198.44)	9 1/4	(234.95)	1 1/8	(28.58)	7 3/16	(182.56)	3/8	4	(101.6)	1350	(6.01)	1.65	(.75)
3	(80)	1/2	8 1/8	(206.38)	9 7/8	(250.83)	1 1/8	(28.58)	7 1/2	(190.50)	3/8	4	(101.6)	1350	(6.01)	1.69	(.77)
3 1/2	(90)	1/2	8 3/8	(212.73)	10 3/8	(263.53)	1 1/4	(31.75)	7 3/4	(196.85)	3/8	4	(101.6)	1350	(6.01)	1.77	(.80)
4	(100)	5/8	9 5/8	(244.48)	11 7/8	(301.63)	1 3/4	(44.45)	8 7/8	(225.43)	3/8	4	(101.6)	1430	(6.36)	2.07	(.94)
5	(125)	5/8	10 5/16	(261.94)	13 1/8	(333.38)	1 7/8	(47.63)	6 13/16	(173.04)	1/2	4	(101.6)	1430	(6.36)	2.99	(1.36)
6	(150)	3/4	10 13/16	(274.64)	14 1/8	(358.78)	1 5/8	(41.28)	9 5/16	(252.41)	1/2	4	(101.6)	1940	(8.63)	3.25	(1.47)
8	(200)	3/4	12 9/16	(319.09)	16 7/8	(428.63)	2 1/8	(53.98)	11 9/16	(293.69)	5/8	4	(101.6)	2000	(8.90)	4.60	(2.09)
10	(250)	7/8	14 1/8	(358.78)	19 1/2	(495.30)	2 5/8	(66.68)	13 3/8	(339.73)	3/4	4	(101.6)	3600	(16.01)	8.97	(4.07)
12	(300)	7/8	15 3/4	(400.05)	22 1/8	(561.98)	2 5/8	(66.68)	14 5/8	(371.48)	3/4	4	(101.6)	3800	(16.90)	11.12	(5.04)

Adjustment "D" (Top of cross bolt to bottom of hanger rod nut.)

CLEVIS HANGERS

FIG. 440, 440F, & 441

LIGHT DUTY CLEVIS HANGER



Function: Designed for the suspension of non-insulated stationary pipe lines in light duty applications. Fig. 440F has a layer of felt which helps to reduce sound and vibration.

Material: Carbon steel

Finish: Plain (**Fig. 440**), plain with felt lining (**Fig. 440F**), or electro-galvanized (**Fig. 441**) (Hot dipped galvanized with electro-galvanized hardware upon request)

Approvals: Complies with Federal Specification A-A-1192A (Type 1) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 1) which supersedes ANSI/MSS SP-69.

Ordering: Specify figure number and pipe size.

NOTE: Use of an upper locknut ensures proper performance. If ordering Fig. 440F felt lined hangers for pipe sizes of 3 1/2" (90) or under, order the next largest size to allow for the thickness of the felt lining.

Pipe Size		Rod Size A	B		C		Adjustment D		E		Cross Bolt	Max. Rec. Load		Wt. Each	
												lbs.	kN	lbs.	kg
1/2	(15)	3/8	2 9/16	(65.09)	3	(76.20)	1 1/4	(31.75)	2 3/16	(55.56)	1/4	150	(0.67)	.17	(.08)
3/4	(20)	3/8	2 5/8	(66.68)	3 1/8	(79.38)	1 5/16	(33.34)	2 1/4	(57.15)	1/4	250	(1.11)	.22	(.10)
1	(25)	3/8	3 1/16	(77.79)	3 3/4	(95.25)	1 11/16	(42.86)	2 11/16	(68.26)	1/4	250	(1.11)	.22	(.10)
1 1/4	(32)	3/8	3 5/16	(84.14)	4 1/8	(104.78)	1 9/16	(39.69)	2 7/8	(73.03)	1/4	250	(1.11)	.29	(.13)
1 1/2	(40)	3/8	3 7/16	(87.31)	4 3/8	(111.13)	1 9/16	(39.69)	3	(76.20)	1/4	250	(1.11)	.30	(.14)
2	(50)	3/8	3 11/16	(93.66)	4 7/8	(123.83)	1 11/16	(42.86)	3 1/4	(82.55)	1/4	250	(1.11)	.34	(.15)
2 1/2	(65)	1/2	4 5/8	(117.5)	6 1/16	(154.0)	1 1/4	(31.75)	3 1/4	(82.55)	3/8	350	(1.56)	.68	(.31)
3	(80)	1/2	4 7/8	(123.83)	6 5/8	(168.28)	1 1/4	(31.75)	3 9/16	(90.49)	3/8	350	(1.56)	.72	(.33)
3 1/2	(90)	1/2	4 1/2	(114.3)	6 1/2	(165.10)	1 5/16	(33.34)	3 15/16	(100.01)	3/8	350	(1.56)	.84	(.38)
4	(100)	5/8	5 1/2	(139.7)	7 11/16	(195.3)	1 5/16	(33.34)	5	(127.00)	3/8	400	(1.78)	.97	(.44)

Adjustment "D" (Top of cross bolt to bottom of hanger rod nut.)

CLEVIS HANGERS

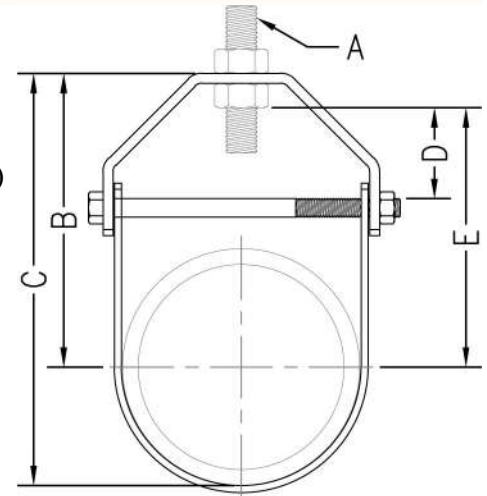


COPPER TUBING CLEVIS HANGER

FIG. 442

- Function:** Designed for the suspension of non-insulated stationary copper tubing.
- Material:** Carbon steel
- Finish:** Copper Color Epoxy Finish
- Approvals:** Complies with Federal Specifications A-A-1192A (Type 1) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 1) which supersedes ANSI/MSS SP-69.
- Ordering:** Specify figure number and tube size.

NOTE: Use of an upper locknut ensures proper performance.



Tube Size		Rod Size A	B		C		Adjustment D		E		Cross Bolt	Max. Rec. Load		Wt. Each	
												lbs.	kN	lbs.	kg
1/2	(15)	3/8	1 7/8	(47.63)	2 3/16	(55.56)	1/2	(12.70)	1 1/8	(28.58)	1/4	150	(0.67)	.12	(.05)
3/4	(20)	3/8	1 3/4	(44.45)	2 1/8	(53.98)	1/2	(12.70)	1	(25.40)	1/4	250	(1.11)	.12	(.05)
1	(25)	3/8	1 13/16	(46.04)	2 5/16	(58.74)	1/2	(12.70)	1 1/16	(26.99)	1/4	250	(1.11)	.13	(.06)
1 1/4	(32)	3/8	2 1/8	(53.98)	2 3/4	(69.85)	3/4	(19.05)	1 5/16	(33.34)	1/4	250	(1.11)	.15	(.07)
1 1/2	(40)	3/8	2 1/2	(63.50)	3 1/4	(82.55)	15/16	(23.81)	1 3/4	(44.45)	1/4	250	(1.11)	.17	(.08)
2	(50)	3/8	2 15/16	(74.61)	4	(101.60)	1 1/16	(26.99)	2 3/16	(55.56)	1/4	250	(1.11)	.24	(.11)
2 1/2	(65)	1/2	4 7/8	(123.83)	5 3/4	(146.05)	2 1/16	(52.39)	3 3/8	(85.73)	1/4	350	(1.56)	.69	(.31)
3	(80)	1/2	4 1/2	(114.30)	6 1/8	(155.58)	2	(50.80)	3 7/16	(87.31)	1/4	350	(1.56)	.77	(.35)
3 1/2	(90)	1/2	4 3/4	(120.65)	6 1/2	(165.10)	1 13/16	(46.04)	3 11/16	(93.66)	1/4	350	(1.56)	.89	(.40)
4	(100)	1/2	5 7/8	(149.23)	7 7/8	(200.03)	2 9/16	(65.09)	4 3/4	(120.65)	5/16	400	(1.78)	.91	(.41)
5	(125)	5/8	5 7/8	(149.23)	8 3/4	(222.25)	1 5/8	(41.28)	4 3/4	(120.65)	3/8	550	(2.45)	1.90	(.86)
6	(150)	5/8	6 1/16	(153.99)	9	(228.60)	1 1/2	(38.10)	4 3/4	(120.65)	3/8	550	(2.45)	2.20	(1.00)

Adjustment "D" (Top of cross bolt to bottom of hanger rod nut.)

CLEVIS HANGERS

FIG. 450, 450F, 451, 451F, 453, & 454 STANDARD CLEVIS HANGER

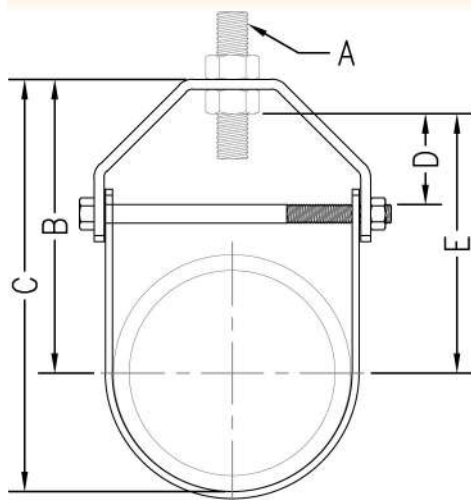


Fig. 450F, 451F, & 453 only available up to 8" (200) Pipe Size

- Function:** Designed for the suspension of non-insulated stationary pipe lines. Fig. 450F has a layer of felt which separates the pipe from the hanger to reduce vibration and sound. The PVC coating on Fig. 453 protects the pipe from the metal surface of the hanger.
- Material:** Carbon steel
- Finish:** Plain (Fig. 450), plain with felt lining (Fig. 450F), electro-galvanized (Fig. 451), electro-galvanized with felt lining (Fig. 451F), plain with PVC coating (Fig. 453), or hot dipped galvanized with electro-galvanized hardware (Fig. 454)
- Approvals:** Underwriters' Laboratories Listed in the U.S. (UL) and Canada (CUL), and Factory Mutual Approved for 2 1/2" (65) to 8" (200) only. Complies with Federal Specification A-A-1192A (Type 1) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 1) which supersedes ANSI/MSS SP-69.
- Ordering:** Specify figure number and pipe size.

NOTE: Use of an upper locknut ensures proper performance. Pipe spacers provided on 30" (750mm) and larger clevises. If ordering Fig. 450F felt lined hangers for pipe sizes of 3 1/2" (90mm) or under, order the next largest size to allow for the thickness of the felt lining. When an oversized clevis is used, a pipe spacer should be placed over the clevis bolt to prevent the lower U-strap from moving inward.

Pipe Size		Rod Size A	B		C		Adjustment D		E		Cross Bolt	Max. Rec. Load		Wt. Each	
												lbs.	kN	lbs.	kg
1/2	(15)	3/8	2 7/16	(61.9)	2 7/8	(73.0)	1 1/8	(28.6)	2	(50.8)	1/4	730	(3.25)	0.24	(0.11)
3/4	(20)	3/8	2 5/8	(66.7)	3 1/8	(79.4)	1 1/4	(31.8)	2 3/16	(55.6)	1/4	730	(3.25)	0.24	(0.11)
1	(25)	3/8	3 1/16	(77.8)	3 3/4	(95.3)	1 5/8	(41.3)	2 5/8	(66.7)	1/4	730	(3.25)	0.28	(0.13)
1 1/4	(32)	3/8	3 3/8	(85.7)	4 3/16	(106.4)	1 5/8	(41.3)	2 15/16	(74.6)	1/4	730	(3.25)	0.32	(0.15)
1 1/2	(40)	3/8	3 1/2	(88.9)	4 7/16	(112.7)	1 1/2	(38.1)	3 1/16	(77.8)	1/4	730	(3.25)	0.40	(0.18)
2	(50)	3/8	3 3/4	(95.3)	5	(127.0)	1 5/8	(41.3)	3 5/16	(84.1)	1/4	730	(3.25)	0.52	(0.24)
2 1/2	(65)	1/2	4 5/8	(117.5)	6 1/16	(154.0)	2	(50.8)	4 1/16	(103.2)	3/8	1350	(6.01)	0.72	(0.33)
3	(80)	1/2	4 7/8	(123.8)	6 5/8	(168.3)	1 3/16	(46.0)	4 1/4	(108.0)	3/8	1350	(6.01)	0.78	(0.35)
3 1/2	(90)	1/2	4 1/2	(114.3)	6 1/2	(165.1)	1 1/4	(31.8)	3 7/8	(98.4)	3/8	1350	(6.01)	1.16	(0.53)
4	(100)	5/8	5 1/2	(139.7)	7 11/16	(195.3)	1 3/4	(44.5)	4 11/16	(119.1)	3/8	1430	(6.36)	1.35	(0.61)
5	(125)	5/8	6 1/8	(155.6)	9 1/8	(231.8)	1 7/8	(47.6)	5 5/16	(134.9)	1/2	1430	(6.36)	1.88	(0.85)
6	(150)	3/4	6 7/8	(174.6)	10 1/8	(257.2)	1 5/8	(41.3)	6	(152.4)	1/2	1940	(8.63)	2.76	(1.25)
8	(200)	3/4	8 3/4	(222.3)	12 7/8	(327.0)	2 1/8	(54.0)	7 7/8	(200.0)	5/8	2000	(8.90)	4.35	(1.97)
10	(250)	7/8	10 3/8	(263.5)	15 3/4	(400.1)	2 3/8	(60.3)	9 1/8	(231.8)	3/4	3600	(16.01)	8.22	(3.73)
12	(300)	7/8	11 5/8	(295.3)	18	(457.2)	2 1/2	(63.5)	10 1/2	(266.7)	3/4	3800	(16.90)	10.05	(4.56)
14	(350)	1	12 3/4	(323.9)	19 3/4	(501.7)	2 5/8	(66.7)	11 1/4	(285.8)	7/8	4200	(18.68)	12.97	(5.88)
16	(400)	1	14 1/8	(358.8)	22 1/8	(562)	2 5/8	(66.7)	13 5/8	(346.1)	1	4600	(20.46)	20.85	(9.46)
18	(450)	1	16 1/2	(419.1)	25 1/2	(647.7)	3 1/2	(88.9)	15	(381.0)	1 1/8	4800	(21.35)	24.75	(11.23)
20	(500)	1 1/4	18	(457.2)	28	(711.2)	4 1/8	(104.8)	16 1/8	(409.6)	1 1/4	4800	(21.35)	42.45	(19.26)
24	(600)	1 1/4	20 1/4	(514.4)	32 1/4	(819.2)	4 3/4	(120.7)	18 3/8	(466.7)	1 1/4	4800	(21.35)	48.65	(22.07)
30	(750)	1 1/4	24 1/2	(622.3)	38 7/8	(987.4)	5 1/2	(139.7)	21 1/2	(546.1)	1 1/4	6000	(26.69)	69.83	(31.67)
36	(900)	1 1/2	32	(812.8)	50	(1270.0)	8 3/4	(222.3)	30	(762.0)	1 1/2	9500	(42.26)	175.00	(79.38)

Adjustment "D" (Top of cross bolt to bottom of hanger rod nut.)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

CLEVIS HANGERS



PLASTIC PIPE CLEVIS HANGER

FIG. 450V

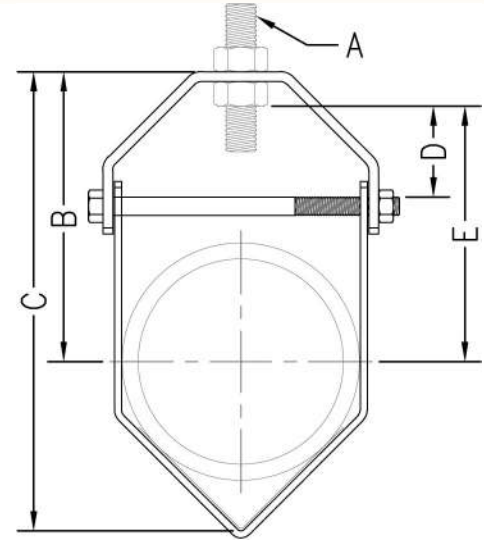
Function: Designed for the suspension of flexible plastic pipe lines. Used in conjunction with Fig. 450T.

Material: Carbon steel (Type 304 or 316 Stainless Steel upon request)

Finish: Plain or electro-galvanized (Hot dipped galvanized with electro-galvanized hardware upon request)

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

NOTE: Use of an upper locknut ensures proper performance.



Size No.	Pipe Size		Rod Size A	B		C		Adjustment D		E		Cross Bolt	Max. Rec. Load		Wt. Each	
													lbs.	kN	lbs.	kg
1	1/2	(15)	3/8	4 3/4	(120.65)	5 1/2	(139.70)	1 5/8	(41.28)	4 5/16	(109.54)	1/4	150	(.67)	.38	(.17)
1	3/4	(20)	3/8	4 9/16	(115.89)	5 1/2	(139.70)	1 5/8	(41.28)	4 1/8	(104.78)	1/4	150	(.67)	.38	(.17)
1	1	(25)	3/8	6 3/8	(161.93)	5 1/2	(139.70)	1 5/8	(41.28)	3 15/16	(100.01)	1/4	150	(.67)	.38	(.17)
1	1 1/4	(32)	3/8	4 1/8	(104.78)	5 1/2	(139.70)	1 5/8	(41.28)	3 11/16	(93.66)	1/4	150	(.67)	.38	(.17)
1	1 1/2	(40)	3/8	4	(101.60)	5 1/2	(139.70)	1 5/8	(41.28)	3 9/16	(90.49)	1/4	150	(.67)	.38	(.17)
1	2	(50)	3/8	3 11/16	(93.66)	5 1/2	(139.70)	1 5/8	(41.28)	3 1/4	(82.55)	1/4	150	(.67)	.38	(.17)
2	2 1/2	(65)	5/8	6 5/8	(168.28)	8 3/4	(222.25)	1 3/4	(44.45)	5 13/16	(147.64)	3/8	150	(.67)	1.15	(.52)
2	3	(80)	5/8	6 3/16	(157.16)	8 3/4	(222.25)	1 3/4	(44.45)	5 3/8	(136.53)	3/8	150	(.67)	1.15	(.52)
2	3 1/2	(90)	5/8	5 13/16	(147.64)	8 3/4	(222.25)	1 3/4	(44.45)	5	(127.00)	3/8	150	(.67)	1.15	(.52)
2	4	(100)	5/8	5 7/16	(138.11)	8 3/4	(222.25)	1 3/4	(44.45)	4 5/8	(117.48)	3/8	150	(.67)	1.15	(.52)

Adjustment "D" (Top of cross bolt to bottom of hanger rod nut.)

PLASTIC PIPE SUPPORT TROUGH

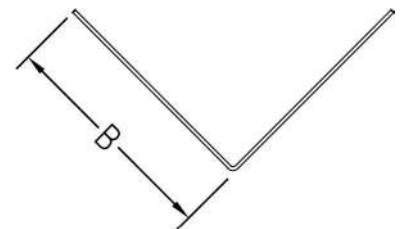
FIG. 450T

Function: Designed for use with Fig. 450V as a support for plastic or other flexible pipe systems. Hangers should be placed as close to the trough joints as possible.

Material: Carbon steel (Type 304 or 316 Stainless Steel upon request)

Finish: Pre-galvanized

Ordering: Specify figure number, size number, and material.



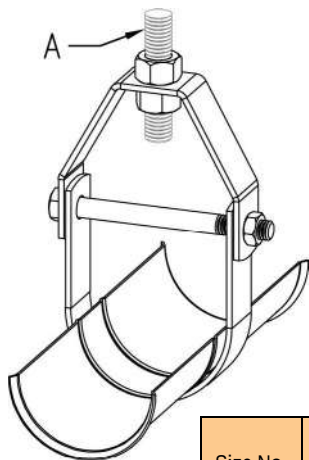
Size No.	For Pipe Sizes		B		Steel Gauge	Trough Length		Max. Rec. Load		Wt. Each	
						ft.	M	lbs.	kN	lbs.	kg
1	1/2 - 2	(15 - 50)	1 1/2	(38.1)	18 ga.	10	(3.05)	150	(.67)	.540	(.245)
2	2 1/2 - 4	(65 - 100)	3	(76.2)	18 ga.	10	(3.05)	150	(.67)	1.08	(.488)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

CLEVIS HANGERS

FIG. 455 & 456

CLEVIS WITH SECURED INSULATION SHIELD



Function: Designed for the suspension of stationary insulated pipe lines. Fig. 455 is a combination of our Fig. 160 shield welded to a Fig. 450 or Fig. 451 clevis hanger which ensures that the shield will be installed in conjunction with the hanger. The shield is furnished with flared ends to prevent it from cutting into the insulation.

Material: Carbon steel (Type 304 or 316 Stainless Steel upon request)

Finish: Plain with pre-galvanized shield (**Fig. 455**) or electro-galvanized with pre-galvanized shield (**Fig. 456**)

Ordering: Specify figure number, size number, and material.

NOTE: To determine proper size, consult shield selection guide. Use of an upper locknut ensures proper performance.

Size No.	Rod Size A	Shield I.D.		Shield Length		Shield Gauge	Hanger Size		Wt. Each	
									lbs.	kg
1	3/8	2 3/8	(60.33)	8	(203.2)	18	2	(50)	.95	(.43)
2	1/2	2 5/8	(66.68)	8	(203.2)	18	2 1/2	(65)	1.50	(.68)
3	1/2	2 7/8	(73.03)	8	(203.2)	18	2 1/2	(65)	1.54	(.70)
4	1/2	3 1/2	(88.90)	8	(203.2)	18	3	(80)	1.62	(.73)
5	1/2	4	(101.60)	8	(203.2)	18	3 1/2	(90)	1.95	(.88)
6	5/8	4 1/2	(114.30)	8	(203.2)	18	4	(100)	2.38	(1.08)
7	5/8	5	(127.00)	8	(203.2)	18	5	(125)	2.98	(1.35)
8	5/8	5 5/8	(142.88)	8	(203.2)	18	5	(125)	3.10	(1.41)
9	3/4	6	(152.40)	8	(203.2)	18	6	(150)	3.77	(1.71)
10	3/4	6 5/8	(168.28)	8	(203.2)	18	6	(150)	3.92	(1.78)
11	3/4	7 5/8	(193.68)	12	(304.8)	18	8	(200)	6.33	(2.87)
12	3/4	8 5/8	(219.08)	12	(304.8)	18	8	(200)	6.66	(3.02)
13	7/8	9 5/8	(244.48)	12	(304.8)	18	10	(250)	10.84	(4.92)
14	7/8	10 3/4	(273.05)	12	(304.8)	18	10	(250)	11.17	(5.07)
15	7/8	10 3/4	(273.05)	12	(304.8)	18	12	(300)	13.39	(6.07)
16	7/8	12 3/4	(323.85)	12	(304.8)	18	12	(300)	13.65	(6.19)
17	1	14	(355.60)	12	(304.8)	18	14	(350)	16.93	(7.68)
18	1	15	(381.00)	12	(304.8)	18	16	(400)	25.08	(11.38)
19	1	16	(406.40)	12	(304.8)	18	16	(400)	25.20	(11.43)
20	1	17	(431.80)	12	(304.8)	18	18	(450)	29.55	(13.40)
21	1	18	(457.20)	12	(304.8)	18	18	(450)	29.83	(13.53)
22	1 1/4	19	(482.60)	12	(304.8)	18	20	(500)	47.81	(21.69)
24	1 1/4	21	(533.40)	12	(304.8)	18	24	(600)	53.73	(24.37)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

CLEVIS HANGERS

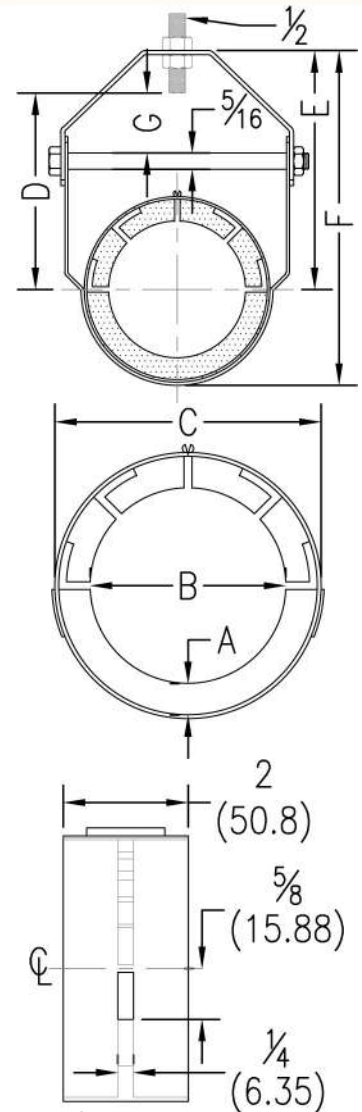


CLEVIS SERIES KLO-SHURE HANGER

FIG. 703025 - 708362

3/8" (9.52) Insulation Thickness A																
Figure Number	Inner Diameter B		Coupling Outer Diameter C		D		E		F		G		Max. Rec. Load		Wt. Each	
													lbs.	kN	Lbs.	kg
703025*	1/4	(6.35)	1 1/8	(28.58)	-	-	-	-	-	-	-	-	-	-	0.03	(0.01)
703037*	3/8	(9.53)	1 1/4	(31.75)	-	-	-	-	-	-	-	-	-	-	0.03	(0.01)
703050*	1/2	(12.70)	1 3/8	(34.93)	-	-	-	-	-	-	-	-	-	-	0.04	(0.02)
703062*	5/8	(15.88)	1 1/2	(38.10)	-	-	-	-	-	-	-	-	-	-	0.04	(0.02)
703075*	3/4	(19.05)	1 5/8	(41.28)	-	-	-	-	-	-	-	-	-	-	0.04	(0.02)
703087	7/8	(22.23)	1 3/4	(44.45)	2 1/2	(63.50)	3 3/8	(85.73)	4 3/8	(111.13)	7 1/16	(11.11)	250	(1.11)	0.50	(0.23)
703100*	1	(25.40)	1 7/8	(47.63)	-	-	-	-	-	-	-	-	-	-	0.05	(0.02)
703112*	1 1/8	(28.58)	2	(50.80)	2 7/8	(73.03)	3 1/2	(88.90)	4 5/8	(117.48)	5 7/8	(15.88)	250	(1.11)	0.52	(0.24)
703137	1 3/8	(34.93)	2 1/4	(57.15)	3 3/16	(80.96)	3 13/16	(96.84)	5	(127.00)	15/16	(23.81)	250	(1.11)	0.54	(0.25)
703162	1 5/8	(41.28)	2 1/2	(63.50)	3 1/2	(88.90)	4	(101.60)	5 1/2	(139.70)	1 1/16	(26.99)	250	(1.11)	0.56	(0.25)
703212	2 1/8	(53.98)	3	(76.20)	4 3/16	(106.36)	4 3/4	(120.65)	6 1/2	(165.10)	1 5/16	(33.34)	250	(1.11)	0.65	(0.29)
1/2" (12.7) Insulation Thickness A																
704037*	3/8	(9.53)	1 1/2	(38.10)	-	-	-	-	-	-	-	-	-	-	0.04	(0.02)
704050*	1/2	(12.70)	1 5/8	(41.28)	-	-	-	-	-	-	-	-	-	-	0.05	(0.02)
704062	5/8	(15.88)	1 3/4	(44.45)	2 1/2	(63.50)	3 3/8	(85.73)	4 3/8	(111.13)	7 1/16	(11.11)	250	(1.11)	0.50	(0.23)
704075	3/4	(19.05)	1 7/8	(47.63)	2 5/8	(66.68)	3 7/16	(87.31)	4 1/2	(114.30)	1/2	(12.70)	250	(1.11)	0.50	(0.23)
704087	7/8	(22.23)	2	(50.80)	2 7/8	(73.03)	3 1/2	(88.90)	4 5/8	(117.48)	5 7/8	(15.88)	250	(1.11)	0.52	(0.24)
704100	1	(25.40)	2 1/8	(53.98)	3	(76.20)	3 5/8	(92.08)	4 7/8	(123.83)	7 7/8	(22.23)	250	(1.11)	0.54	(0.24)
704112	1 1/8	(28.58)	2 1/4	(57.15)	3 3/16	(80.96)	3 13/16	(96.84)	5	(127.00)	15/16	(23.81)	250	(1.11)	0.55	(0.25)
704137	1 3/8	(34.93)	2 1/2	(63.50)	3 1/2	(88.90)	4	(101.60)	5 1/2	(139.70)	1 1/16	(26.99)	250	(1.11)	0.57	(0.26)
704162	1 5/8	(41.28)	2 3/4	(69.85)	3 3/4	(95.25)	4 3/8	(111.13)	5 7/8	(149.23)	1 1/4	(31.75)	250	(1.11)	0.62	(0.28)
704212	2 1/8	(53.98)	3 1/4	(82.55)	4 1/2	(114.30)	5 1/8	(130.18)	6 7/8	(174.63)	1 7/16	(36.51)	250	(1.11)	0.71	(0.32)
704262	2 5/8	(66.68)	3 3/4	(95.25)	5	(127.00)	5 5/8	(142.88)	7 5/8	(193.68)	1 11/16	(42.86)	350	(1.56)	0.98	(0.44)
704312	3 1/8	(79.38)	4 1/4	(107.95)	5 13/16	(147.64)	6 7/16	(163.51)	8 3/4	(222.25)	2 1/8	(53.98)	350	(1.56)	1.16	(0.53)
704362	3 5/8	(92.08)	4 3/4	(120.65)	6 5/16	(160.34)	6 7/8	(174.63)	9 3/8	(238.13)	2 15/16	(74.61)	350	(1.56)	1.21	(0.55)
704412	4 1/8	(104.78)	5 1/4	(133.35)	6 7/8	(174.63)	7 1/2	(190.50)	10 1/8	(257.18)	2 9/16	(65.09)	350	(1.56)	1.32	(0.60)
3/4" (19.05) Insulation Thickness A																
706025	1/4	(6.35)	1 7/8	(47.63)	2 5/8	(66.68)	3 7/16	(87.31)	4 1/2	(114.30)	1/2	(12.70)	250	(1.11)	0.51	(0.23)
706037	3/8	(9.53)	2	(50.80)	2 7/8	(73.03)	3 1/2	(88.90)	4 5/8	(117.48)	5 7/8	(15.88)	250	(1.11)	0.52	(0.24)
706050	1/2	(12.70)	2 1/8	(53.98)	3	(76.20)	3 5/8	(92.08)	4 7/8	(123.83)	7 7/8	(22.23)	250	(1.11)	0.54	(0.24)
706062	5/8	(15.88)	2 1/4	(57.15)	3 3/16	(80.96)	3 13/16	(96.84)	5	(127.00)	15/16	(23.81)	250	(1.11)	0.56	(0.25)
706075	3/4	(19.05)	2 3/8	(60.33)	3 5/16	(84.14)	3 15/16	(100.01)	5 1/4	(133.35)	1	(25.40)	250	(1.11)	0.58	(0.26)
706087	7/8	(22.23)	2 1/2	(63.50)	3 1/2	(88.90)	4	(101.60)	5 1/2	(139.70)	1 1/16	(26.99)	250	(1.11)	0.59	(0.27)
706112	1 1/8	(28.58)	2 3/4	(69.85)	3 3/4	(95.25)	4 3/8	(111.13)	5 7/8	(149.23)	1 1/4	(31.75)	250	(1.11)	0.64	(0.29)
706137	1 3/8	(34.93)	3	(76.20)	4 3/16	(106.36)	4 3/4	(120.65)	6 1/2	(165.10)	1 5/16	(33.34)	250	(1.11)	0.64	(0.29)
706162	1 5/8	(41.28)	3 1/4	(82.55)	4 1/2	(114.30)	5 1/8	(130.18)	6 7/8	(174.63)	1 7/16	(36.51)	250	(1.11)	0.69	(0.31)
706212	2 1/8	(53.98)	3 3/4	(95.25)	5	(127.00)	5 5/8	(142.88)	7 5/8	(193.68)	1 11/16	(42.86)	350	(1.56)	0.99	(0.45)
706262	2 5/8	(66.68)	4 1/4	(107.95)	5 13/16	(147.64)	6 7/16	(163.51)	8 3/4	(222.25)	2 1/8	(53.98)	350	(1.56)	1.18	(0.54)
706312	3 1/8	(79.38)	4 3/4	(120.65)	6 5/16	(160.34)	6 7/8	(174.63)	9 3/8	(238.13)	2 5/16	(58.74)	350	(1.56)	1.24	(0.56)
706362	3 5/8	(92.08)	5 1/4	(133.35)	6 7/8	(174.63)	7 1/2	(190.50)	10 1/8	(257.18)	2 9/16	(65.09)	350	(1.56)	1.35	(0.61)
706412	4 1/8	(104.78)	5 3/4	(146.05)	7 1/4	(184.15)	7 7/8	(200.03)	10 3/4	(273.05)	2 3/4	(69.85)	350	(1.56)	1.45	(0.66)
1" (25.4) Insulation Thickness A																
708062	5/8	(15.88)	2 3/4	(69.85)	3 3/4	(95.25)	4 3/8	(111.13)	5 7/8	(149.23)	1 1/4	(31.75)	250	(1.11)	0.66	(0.30)
708087	7/8	(22.23)	3	(76.20)	4 3/16	(106.36)	4 3/4	(120.65)	6 1/2	(165.10)	1 5/16	(33.34)	250	(1.11)	0.68	(0.31)
708112	1 1/8	(28.58)	3 1/4	(82.55)	4 1/2	(114.30)	5 1/8	(130.18)	6 7/8	(174.63)	1 7/16	(36.51)	250	(1.11)	0.73	(0.33)
708137	1 3/8	(34.93)	3 1/2	(88.90)	4 3/4	(120.65)	5 3/8	(136.53)	7 1/4	(184.15)	1 9/16	(39.69)	350	(1.56)	1.05	(0.48)
708162	1 5/8	(41.28)	3 3/4	(95.25)	5	(127.00)	5 5/8	(142.88)	7 5/8	(193.68)	1 11/16	(42.86)	350	(1.56)	1.01	(0.46)
708212	2 1/8	(53.98)	4 1/4	(107.95)	5 13/16	(147.64)	6 7/16	(163.51)	8 3/4	(222.25)	2 1/8	(53.98)	350	(1.56)	1.16	(0.53)
708262	2 5/8	(66.68)	4 3/4	(120.65)	6 5/16	(160.34)	6 7/8	(174.63)	9 3/8	(238.13)	2 5/16	(58.74)	350	(1.56)	1.20	(0.55)
708312	3 1/8	(79.38)	5 1/4	(133.35)	6 7/8	(174.63)	7 1/2	(190.50)	10 1/8	(257.18)	2 9/16	(65.09)	350	(1.56)	1.38	(0.62)
708362	3 5/8	(92.08)	5 3/4	(146.05)	7 1/4	(184.15)	7 7/8	(200.03)	10 3/4	(273.05)	2 3/4	(69.85)	350	(1.56)	1.41	(0.64)
*Does not include metal clevs hanger																

*Does not include metal clevis hanger.



Function:

Designed for the suspension of stationary insulated OD tube or nominal pipe lines utilizing elastomeric insulation. Classified 2043 (25/50) for use in plenums and air handling systems.

Hanger Material:

Carbon steel

Cushion Material:

Washington Penn TPO in accordance with ASTM D 4000, TEO0120, A45000

Finish:

Western Gold

Ordering:

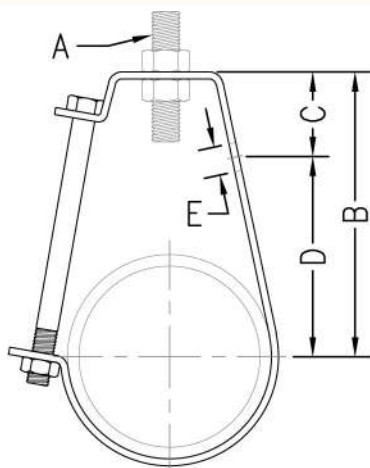
Specify figure number.

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

CLEVIS HANGERS

FIG. 970, 970F, & 973

J-HANGER



Function: Designed for the suspension of stationary piping systems. The “T” slot in the hanger permits the side bolt to be installed after installation and setting of pipe. The side hole permits optional wall mounting. Fig. 970F has a layer of felt which helps to reduce vibration and sound.

Material: Carbon steel

Finish: Electro-galvanized (**Fig. 970**), electro-galvanized with felt lining (**Fig. 970F**), or electro-galvanized with PVC coating (**Fig. 973**)

Approvals: Complies with Federal Specification A-A-1192A (Type 5) and Manufacturers’ Standardization Society ANSI/MSS SP-58 (Type 5) which supersedes ANSI/MSS SP-69.

Ordering: Specify figure number and pipe size.

NOTE: If ordering Fig. 970F felt lined hangers for pipe sizes of 3 1/2" (90) or under, order the next largest size to allow for the thickness of the felt lining.

Pipe Size		Rod Size A	B		C		D		Hole Dia. E		Max. Rec. Load		Wt. Each	
											lbs.	kN	lbs.	kg
1/2	(15)	3/8	2 5/8	(66.68)	1	(25.40)	1 5/8	(41.28)	13/32	(10.32)	400	(1.78)	.20	(.09)
3/4	(20)	3/8	2 7/8	(73.03)	1	(25.40)	1 7/8	(47.63)	13/32	(10.32)	400	(1.78)	.23	(.10)
1	(25)	3/8	3 1/16	(77.79)	1	(25.40)	2 1/16	(52.39)	13/32	(10.32)	400	(1.78)	.24	(.11)
1 1/4	(32)	3/8	3 5/16	(84.14)	1 1/16	(26.99)	2 1/4	(57.15)	13/32	(10.32)	400	(1.78)	.27	(.12)
1 1/2	(40)	3/8	3 9/16	(90.49)	1 1/16	(26.99)	2 1/2	(63.50)	13/32	(10.32)	400	(1.78)	.29	(.13)
2	(50)	3/8	3 3/4	(95.25)	1 1/8	(28.58)	2 5/8	(66.68)	13/32	(10.32)	400	(1.78)	.32	(.15)
2 1/2	(65)	1/2	4 7/16	(112.71)	1 1/8	(28.58)	3 5/16	(84.14)	9/16	(14.29)	800	(3.56)	.71	(.32)
3	(80)	1/2	4 7/8	(123.83)	1 1/8	(28.58)	3 3/4	(95.25)	9/16	(14.29)	800	(3.56)	.77	(.35)
3 1/2	(90)	1/2	5 3/16	(131.76)	1 1/8	(28.58)	4 1/16	(103.19)	9/16	(14.29)	800	(3.56)	.84	(.38)
4	(100)	5/8	6 1/8	(155.58)	1 1/8	(28.58)	5	(127.00)	9/16	(14.29)	800	(3.56)	1.39	(.63)
5	(125)	5/8	6 3/4	(171.45)	1 1/8	(28.58)	5 5/8	(142.88)	9/16	(14.29)	800	(3.56)	1.66	(.75)
6	(150)	3/4	7 3/4	(196.85)	1 1/4	(31.75)	6 1/2	(165.10)	9/16	(14.29)	1000	(4.45)	2.26	(1.03)
8	(200)	3/4	9 1/4	(234.95)	1 1/4	(31.75)	8	(203.20)	9/16	(14.29)	1200	(5.34)	3.32	(1.51)

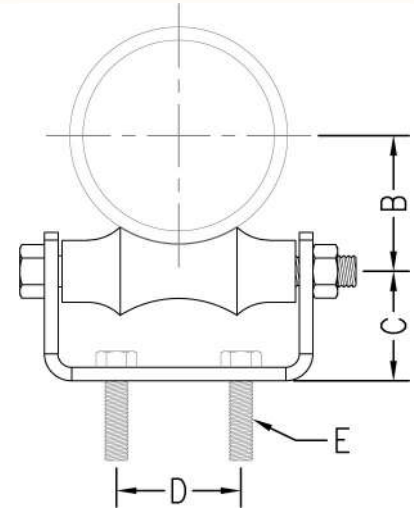
PIPE ROLLER SUPPORTS



PIPE ROLLER CHAIR

FIG. 460

- Function:** Designed for supporting pipe in applications where horizontal movement, due to expansion and contraction, will occur but vertical adjustment is not necessary. The chair can be welded directly to the steel structure or secured in place through bolt holes.
- Sizing:** Pipe roller size shown is for bare pipe. For proper sizing with insulation, refer to pipe roller selection guide, which is for use with pipe covering protection saddles.
- Material:** Cast iron pipe roller with carbon steel chair, axle, and hex nuts. (Type 304 or 316 Stainless Steel upon request)
- Finish:** Plain or electro-galvanized (Hot dipped galvanized with electro-galvanized hardware upon request)
- Approvals:** Complies with Federal Specification A-A-1192A (Type 44) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 44) which supersedes ANSI/MSS SP-69.
- Ordering:** Specify figure number, pipe roller size, material, and finish. Order mounting bolts separately.



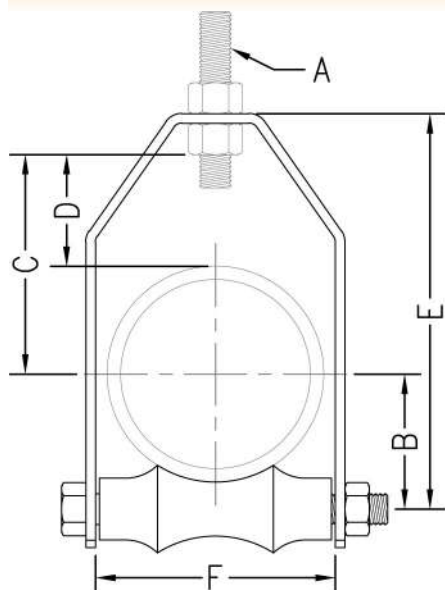
Pipe Roller Size		B		C		D		Recommended Bolt Size (Not included) E	Max. Rec. Load		Wt. Each	
									lbs.	kN	lbs.	kg
2	(50)	1 ⁵ / ₈	(41.28)	1 ¹ / ₂	(38.10)	1 ¹ / ₄	(31.75)	3/8 x 1 ¹ / ₂	300	(1.33)	.90	(.41)
2 ¹ / ₂	(65)	2	(50.80)	1 ⁵ / ₈	(41.28)	1 ¹ / ₄	(31.75)	3/8 x 1 ¹ / ₂	600	(2.67)	1.19	(.54)
3	(80)	2 ¹ / ₄	(57.15)	1 ³ / ₄	(44.45)	2	(50.80)	3/8 x 1 ¹ / ₂	600	(2.67)	1.48	(.67)
3 ¹ / ₂	(90)	2 ⁵ / ₈	(66.68)	2	(50.80)	2	(50.80)	3/8 x 1 ¹ / ₂	600	(2.67)	2.44	(1.11)
4	(100)	2 ³ / ₄	(69.85)	2 ¹ / ₄	(57.15)	2	(50.80)	1/2 x 1 ¹ / ₂	700	(3.11)	2.85	(1.29)
5	(125)	3 ¹ / ₂	(88.90)	2 ¹ / ₂	(63.50)	3	(76.20)	1/2 x 1 ¹ / ₂	700	(3.11)	3.75	(1.70)
6	(150)	4	(101.60)	2 ³ / ₄	(69.85)	3 ¹ / ₄	(82.55)	1/2 x 1 ¹ / ₂	1000	(4.45)	5.76	(2.61)
8	(200)	5 ¹ / ₈	(130.18)	3	(76.20)	3 ³ / ₈	(85.73)	5/8 x 1 ¹ / ₂	1300	(5.78)	8.10	(3.67)
10	(250)	6 ³ / ₈	(161.93)	3 ⁵ / ₈	(92.08)	5 ¹ / ₄	(133.35)	5/8 x 2	1700	(7.56)	12.28	(5.57)
12	(300)	7 ¹ / ₂	(190.50)	4 ¹ / ₈	(104.78)	5 ¹ / ₂	(139.70)	5/8 x 2	2300	(10.23)	20.54	(9.32)
14	(350)	8 ³ / ₈	(212.73)	4 ¹¹ / ₁₆	(119.06)	6 ¹ / ₂	(165.10)	3/4 x 2	3100	(13.79)	25.63	(11.63)
16	(400)	9 ¹ / ₂	(241.30)	5 ³ / ₈	(136.53)	8 ¹ / ₄	(209.55)	3/4 x 2 ¹ / ₂	3900	(17.35)	37.38	(16.96)
18	(450)	10 ¹ / ₂	(266.70)	6	(152.40)	9 ¹ / ₄	(234.95)	3/4 x 2 ¹ / ₂	4200	(18.68)	45.26	(20.53)
20	(500)	11 ⁵ / ₈	(295.28)	6 ³ / ₈	(161.93)	10 ³ / ₈	(263.53)	3/4 x 2 ¹ / ₂	4500	(20.02)	52.35	(23.75)
24	(600)	14	(355.60)	7 ⁷ / ₈	(200.03)	12 ¹ / ₄	(311.15)	7/8 x 3 ¹ / ₂	6000	(26.69)	88.00	(39.92)
30	(750)	17 ¹ / ₄	(438.15)	9 ⁵ / ₈	(244.93)	15 ³ / ₈	(390.53)	7/8 x 3 ¹ / ₂	7290	(32.43)	147.5	(66.9)

"B" (Center of axle to center of pipe)

PIPE ROLLER SUPPORTS

FIG. 470 & 475

PIPE ROLLER HANGER

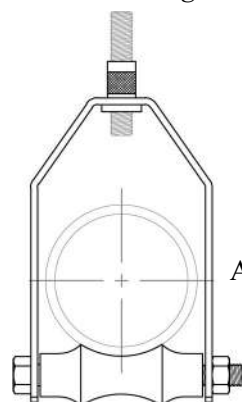


(Fig. 470)

Without adjusting swivel

- Function:** Designed for suspending pipe in applications where horizontal movement, due to expansion and contraction, will occur and vertical adjustment is necessary. The knurled insert provided with Fig. 475 allows easier vertical adjustment.
- Sizing:** Pipe roller size shown is for bare pipe. For proper sizing with insulation, refer to pipe roller selection guide, which is for use with pipe covering protection saddles.
- Material:** Cast iron pipe roller with carbon steel frame, axle, and hex nuts. (Type 304 or 316 Stainless Steel upon request)
- Finish:** Plain or electro-galvanized (Hot dipped galvanized with electro-galvanized hardware upon request)
- Approvals:** Complies with Federal Specification A-A-1192A (Type 43) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 43) which supersedes ANSI/MSS SP-69.
- Ordering:** Specify figure number, pipe roller size, material, and finish.

NOTE: For Fig. 470 use of an upper locknut ensures proper performance.



(Fig. 475)

With adjusting swivel

Available up to 8" (200)
Pipe Roller Size

Pipe Roller Size		Rod Size A	B		C		Adjustment D		E		F		Max. Rec. Load		Wt. Each	
													lbs.	kN	lbs.	kg
2	(50)	3/8	1 5/8	(41.28)	2 5/8	(66.68)	1 1/16	(26.99)	4 3/8	(111.13)	3	(76.20)	150	(0.67)	1.05	(.48)
2 1/2	(65)	1/2	2	(50.80)	2 3/8	(60.33)	1 3/16	(30.16)	5	(127.00)	3 1/4	(82.55)	225	(1.00)	1.29	(.59)
3	(80)	1/2	2 1/4	(57.15)	3 1/2	(88.90)	1 3/4	(44.45)	6 3/8	(161.93)	3 7/8	(98.43)	310	(1.38)	1.56	(.71)
3 1/2	(90)	1/2	2 5/8	(66.68)	3 3/4	(95.25)	1 3/4	(44.45)	7	(177.80)	4 3/8	(111.13)	390	(1.73)	1.83	(.83)
4	(100)	5/8	2 3/4	(69.85)	3 15/16	(100.01)	1 11/16	(42.86)	7 1/2	(190.50)	5	(127.00)	475	(2.11)	2.81	(1.27)
5	(125)	5/8	3 1/2	(88.90)	4 5/16	(109.54)	1 9/16	(39.69)	8 5/8	(219.08)	6	(152.40)	685	(3.05)	4.42	(2.00)
6	(150)	3/4	4	(101.60)	5 3/8	(136.53)	2 1/16	(52.39)	10 1/4	(260.35)	7 1/8	(180.98)	780	(3.47)	5.98	(2.71)
8	(200)	3/4	5 1/8	(130.18)	6 1/2	(165.10)	2 3/16	(55.56)	12 3/4	(323.85)	9 1/4	(234.95)	780	(3.47)	11.42	(5.18)
10	(250)	7/8	6 3/8	(161.93)	7 3/8	(187.33)	2	(50.80)	15	(381.00)	11 1/4	(285.75)	965	(4.29)	17.36	(7.87)
12	(300)	7/8	7 1/2	(190.50)	8 3/4	(222.25)	2 3/8	(60.33)	17 3/8	(441.33)	13 3/4	(336.55)	1200	(5.34)	24.62	(11.17)
14	(350)	1	8 3/8	(212.73)	9	(228.60)	2	(50.80)	18 7/8	(479.43)	14 3/4	(374.65)	1200	(5.34)	36.00	(16.33)
16	(400)	1	9 1/2	(241.30)	9 3/4	(247.65)	1 3/4	(44.45)	20 3/4	(527.05)	16 7/8	(428.63)	1200	(5.34)	44.00	(19.96)
18	(450)	1	10 1/2	(266.70)	11 3/4	(298.45)	2 3/4	(69.85)	23 3/4	(603.25)	18 5/8	(473.08)	1400	(6.23)	54.00	(24.49)
20	(500)	1 1/4	11 5/8	(295.28)	12 1/2	(317.50)	2 1/2	(63.50)	26	(660.40)	20 7/8	(530.23)	1600	(7.12)	74.00	(33.57)
24	(600)	1 1/2	13 13/16	(350.84)	16 1/2	(419.10)	4 1/2	(114.30)	31	(787.40)	25	(635.00)	1600	(7.12)	126.00	(57.15)

"B" (Center of axle to center of pipe)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

PIPE ROLLER SUPPORTS



ADJUSTABLE PIPE ROLLER SUPPORT

FIG. 480 & 480D

Function: Designed to support pipe in applications where horizontal movement, due to expansion and contraction, will occur and a vertical adjustment of up to 6" (152.4) may be required. Fig. 480D is designed for supporting and guiding pipe where longitudinal movement and vertical adjustment are required.

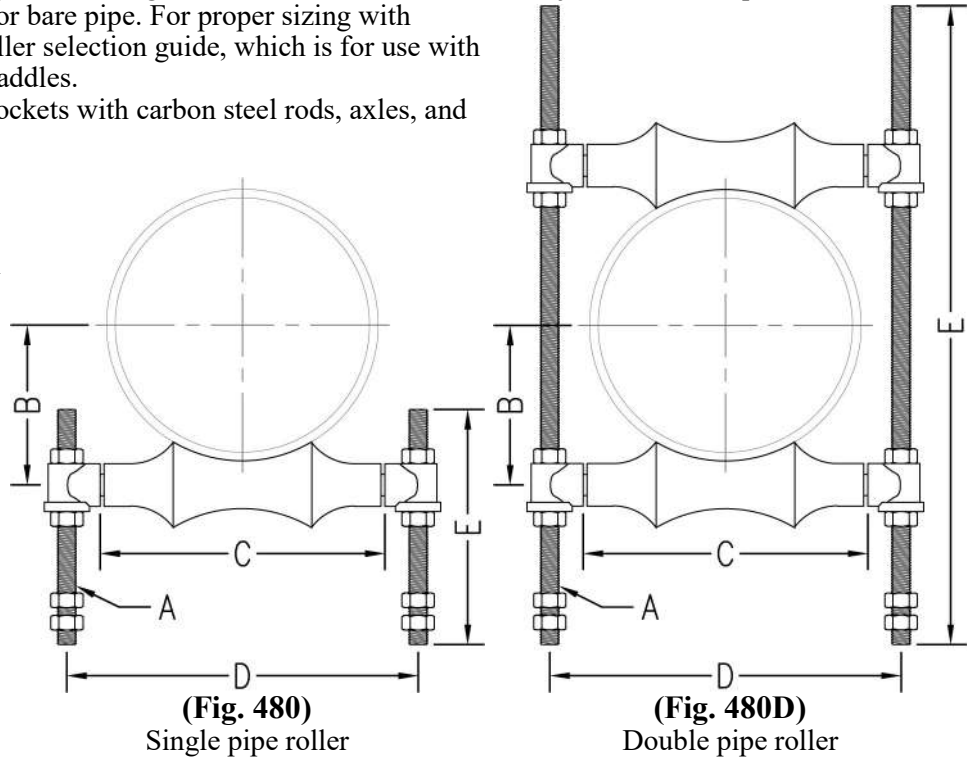
Sizing: Pipe roller size shown is for bare pipe. For proper sizing with insulation, refer to pipe roller selection guide, which is for use with pipe covering protection saddles.

Material: Cast iron pipe roller and sockets with carbon steel rods, axles, and hex nuts.

Finish: Plain or electro-galvanized (Hot dipped galvanized with electro-galvanized hardware upon request)

Approvals: Fig. 480 only, complies with Federal Specification A-A-1192A (Type 41) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 41) which supersedes ANSI/MSS SP-69.

Ordering: Specify figure number, pipe roller size, and finish. Shipped with rods and nuts unassembled.



(Fig. 480)
Single pipe roller

(Fig. 480D)
Double pipe roller

Pipe Roller Size		Rod Size A	B		C		D		E		Max. Rec. Load		Wt. Each			
													480		480D	
									480	480D	lbs.	kN	lbs.	kg	lbs.	kg
2	(50)	3/8	1 5/8	(41.28)	2 7/8	(73.03)	4 1/2	(114.30)	7 1/4	(184.15)	12	(304.8)	600	(2.67)	1.25	(.57)
2 1/2	(65)	1/2	2	(50.80)	3 1/8	(79.38)	5 1/16	(128.59)	8	(203.20)	14	(355.6)	600	(2.67)	2.25	(1.02)
3	(80)	1/2	2 1/4	(57.15)	3 3/4	(95.25)	5 9/16	(141.29)	8	(203.20)	14	(355.6)	700	(3.11)	2.36	(1.07)
3 1/2	(90)	1/2	2 5/8	(66.68)	4 1/4	(107.95)	6 1/16	(153.99)	8	(203.20)	14	(355.6)	750	(3.34)	2.60	(1.18)
4	(100)	5/8	2 3/4	(69.85)	4 3/4	(120.65)	6 3/4	(171.45)	9	(228.60)	18	(457.2)	750	(3.34)	3.65	(1.66)
5	(125)	5/8	3 1/2	(88.90)	5 3/4	(146.05)	8 3/8	(212.73)	9	(228.60)	18	(457.2)	750	(3.34)	4.59	(2.08)
6	(150)	3/4	4	(101.60)	6 7/8	(174.63)	9 7/8	(250.83)	10	(254.00)	24	(609.6)	1070	(4.76)	7.50	(3.40)
8	(200)	7/8	5 1/8	(130.18)	8 7/8	(225.43)	12	(304.80)	10	(254.00)	24	(609.6)	1350	(6.01)	11.00	(4.99)
10	(250)	7/8	6 3/8	(161.93)	11	(279.40)	14	(355.60)	11	(279.40)	30	(762.0)	1730	(7.70)	13.68	(6.21)
12	(300)	7/8	7 1/2	(190.50)	13	(330.20)	16 1/2	(419.10)	11	(279.40)	30	(762.0)	2400	(10.68)	19.30	(8.75)
14	(350)	1	8 3/8	(212.73)	14 3/8	(365.13)	17 3/4	(450.85)	12	(304.80)	36	(914.4)	3130	(13.92)	31.20	(14.15)
16	(400)	1	9 1/2	(241.30)	16 3/8	(415.93)	20 3/4	(527.05)	18	(457.20)	--	--	3970	(17.66)	42.40	(19.23)
18	(450)	1	10 1/2	(266.70)	18 3/8	(466.73)	22 3/8	(568.33)	18	(457.20)	--	--	4200	(18.68)	46.55	(21.11)
20	(500)	1 1/4	11 5/8	(295.28)	20 3/8	(517.53)	24 1/2	(622.30)	18	(457.20)	--	--	4550	(20.24)	66.00	(29.94)
24	(600)	1 1/2	14	(355.60)	24 3/8	(619.13)	28 13/16	(731.84)	24	(609.60)	--	--	6160	(27.40)	102.50	(46.49)
30	(750)	1 1/2	17 1/2	(444.50)	30 3/8	(771.53)	35	(889.00)	24	(609.60)	--	--	7290	(32.43)	186.80	(84.73)

"B" (Center of axle to center of pipe)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

PIPE ROLLER SUPPORTS

FIG. 486

PIPE ROLLER STAND

Function: Designed to support pipe in applications where horizontal movement, due to expansion and contraction, will occur.

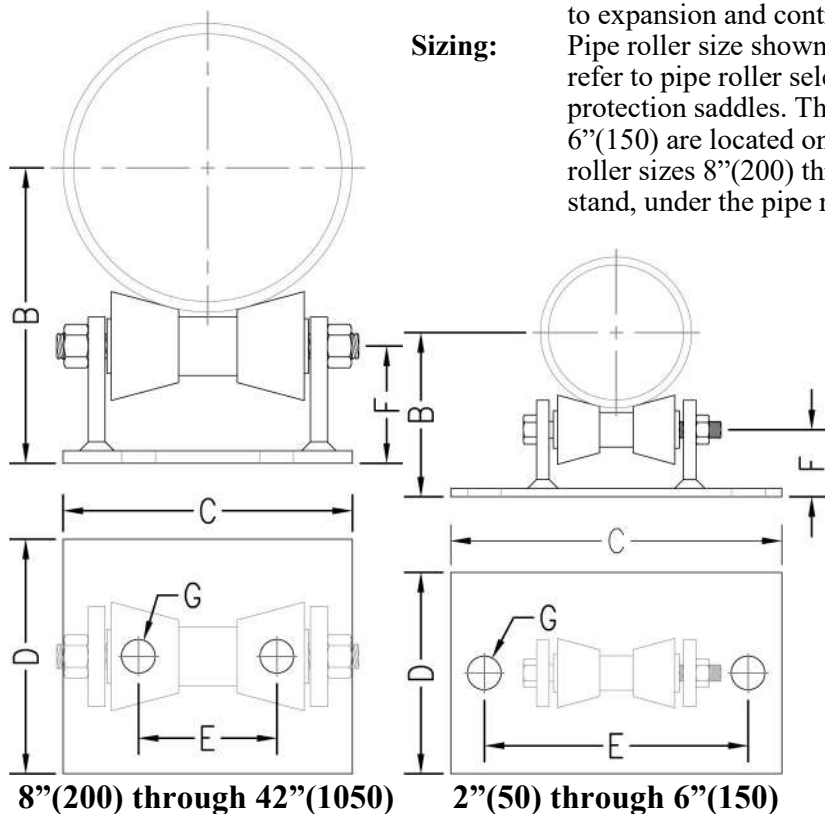
Sizing: Pipe roller size shown is for bare pipe. For proper sizing with insulation, refer to pipe roller selection guide, which is for use with pipe covering protection saddles. The two holes "G" on roller sizes 2"(50) through 6"(150) are located on the outside of the stand. The two holes "G" on roller sizes 8"(200) through 42"(1050) are located on the inside of the stand, under the pipe roller.

Material: Cast iron pipe roller with carbon steel stand, axle, and hex nuts. (Type 304 or 316 Stainless Steel upon request)

Finish: Plain or electro-galvanized (Hot dipped galvanized with electro-galvanized hardware upon request)

Approvals: Complies with Federal Specification A-A-1192A (Type 44) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 44) which supersedes ANSI/MSS SP-69.

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



Pipe Roller Size		B		C		D		E		F		G		Max. Rec. Load		Wt. Each	
														lbs.	kN	lbs.	kg
2	(50)	3 1/2	(88.90)	--	--	6	(152.4)	--	--	1 3/4	(44.45)	1	(25.4)	390	(1.73)	4.48	(2.03)
2 1/2	(65)	3 7/8	(98.43)														
3	(80)	4 1/8	(104.78)														
3 1/2	(90)	4 3/8	(111.13)	--	--	6	(152.4)	--	--	2 1/16	(52.39)	1	(25.4)	950	(4.23)	6.85	(3.11)
4	(100)	4 13/16	(122.24)														
5	(125)	5 7/16	(138.11)														
6	(150)	6 1/16	(153.99)	8 5/8	(219.08)	7	(177.8)	4 1/8	(104.78)	3 7/16	(87.31)	1	(25.4)	2100	(9.34)	14.09	(6.39)
8	(200)	8 11/16	(220.66)														
10	(250)	9 13/16	(249.24)														
12	(300)	11 3/8	(288.93)	10 7/8	(276.23)	8	(203.2)	5 13/16	(147.64)	3 7/8	(98.43)	1	(25.4)	3075	(13.68)	22.09	(10.02)
14	(350)	12	(304.80)														
16	(400)	13 5/8	(346.08)														
18	(450)	14 5/8	(371.48)	12 1/2	(317.50)	9	(228.6)	6 7/8	(174.63)	4 1/4	(107.95)	1	(25.4)	4980	(22.15)	32.00	(14.51)
20	(500)	15 5/8	(396.88)														
24	(600)	17 3/4	(450.85)														
30	(750)	21 7/8	(555.63)	17	(431.80)	12	(304.8)	10	(254.00)	5 1/8	(130.18)	1	(25.4)	7500	(33.36)	80.00	(36.29)
36	(900)	25 3/4	(654.05)														
42	(1050)	28 7/8	(733.43)														

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

PIPE ROLLER SUPPORTS

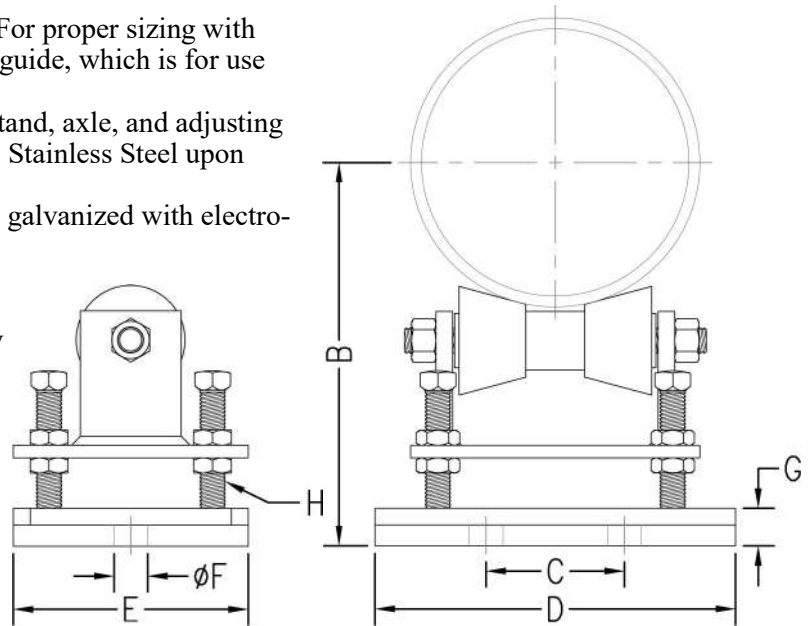


ADJUSTABLE PIPE ROLLER STAND WITH BASE

FIG. 487

- Function:** Designed to support pipe in applications where horizontal movement, due to expansion and contraction, will occur and vertical adjustment is required.
- Sizing:** Pipe roller size shown is for bare pipe. For proper sizing with insulation, refer to pipe roller selection guide, which is for use with pipe covering protection saddles.
- Material:** Cast iron pipe roller with carbon steel stand, axle, and adjusting screws with locknuts. (Type 304 or 316 Stainless Steel upon request)
- Finish:** Plain or electro-galvanized (Hot dipped galvanized with electro-galvanized hardware upon request)
- Approvals:** Complies with Federal Specification A-A-1192A (Type 46) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 46) which supersedes ANSI/MSS SP-69.
- Ordering:** Specify figure number, pipe roller size, material, and finish.

NOTE: Refer to Fig. 486 for measurements of roller stand.



Pipe Roller Size	B					C		D		E		Hole Size F		G		Bolt Size H	Max. Rec. Load		Wt. Each	
	Min.		Max.														lbs.	kN	lbs.	kg
2 (50)	5 ¹ / ₈	(130.18)	5 ³ / ₈	(136.53)		3 ⁷ / ₈	(98.43)	7	(177.80)	5 ¹ / ₂	(139.70)	1	(25.4)	1	(25.4)	5 ⁵ / ₈	390	(1.73)	12.03	(5.46)
2 ¹ / ₂ (65)	5 ³ / ₈	(136.53)	5 ⁵ / ₈	(142.88)																
3 (80)	5 ³ / ₄	(146.05)	6	(152.40)																
3 ¹ / ₂ (90)	6	(152.40)	6 ¹ / ₄	(158.75)		5 ¹ / ₈	(130.18)	8 ³ / ₈	(212.73)	6	(152.4)	1	(25.4)	1	(25.4)	5 ⁵ / ₈	950	(4.23)	15.24	(6.91)
4 (100)	6 ¹ / ₂	(165.10)	7	(177.80)																
5 (125)	7	(177.80)	7 ¹ / ₂	(190.50)																
6 (150)	7 ⁵ / ₈	(193.68)	8 ¹ / ₈	(206.38)		7 ³ / ₈	(187.33)	10 ³ / ₄	(273.05)	7	(177.8)	1	(25.4)	1 ¹ / ₈	(28.58)	3 ³ / ₄	2100	(9.34)	30.59	(13.88)
8 (200)	10 ³ / ₈	(263.53)	11 ⁵ / ₈	(295.28)																
10 (250)	11 ¹ / ₂	(292.10)	12 ³ / ₄	(323.85)																
12 (300)	13	(330.20)	14 ¹ / ₄	(361.95)		9 ¹ / ₂	(241.30)	13 ¹ / ₂	(342.90)	8 ³ / ₈	(212.73)	1	(25.4)	1 ³ / ₈	(34.93)	7 ⁷ / ₈	3075	(13.68)	44.96	(20.39)
14 (350)	13 ⁵ / ₈	(346.08)	14 ⁷ / ₈	(377.83)																
16 (400)	15 ¹ / ₄	(387.35)	16 ⁵ / ₈	(422.28)																
18 (450)	16 ³ / ₈	(415.93)	17 ³ / ₄	(450.85)		11 ¹ / ₈	(282.58)	14 ¹ / ₂	(368.30)	9	(228.6)	1	(25.4)	1 ³ / ₈	(34.93)	1	4980	(22.15)	64.10	(29.08)
20 (500)	17 ³ / ₈	(441.33)	18 ³ / ₄	(476.25)																
24 (600)	19 ⁵ / ₈	(498.48)	21	(533.40)																
30 (750)	24	(609.60)	26 ³ / ₄	(679.45)		15 ³ / ₄	(400.05)	19 ¹ / ₄	(488.95)	12	(304.8)	1	(25.4)	1 ⁵ / ₈	(41.28)	1 ¹ / ₄	7500	(33.36)	142.25	(64.52)
36 (900)	23 ³ / ₁₆	(588.96)	29 ³ / ₁₆	(741.36)																
42 (1050)	29 ¹ / ₄	(742.95)	32 ¹ / ₄	(819.15)																

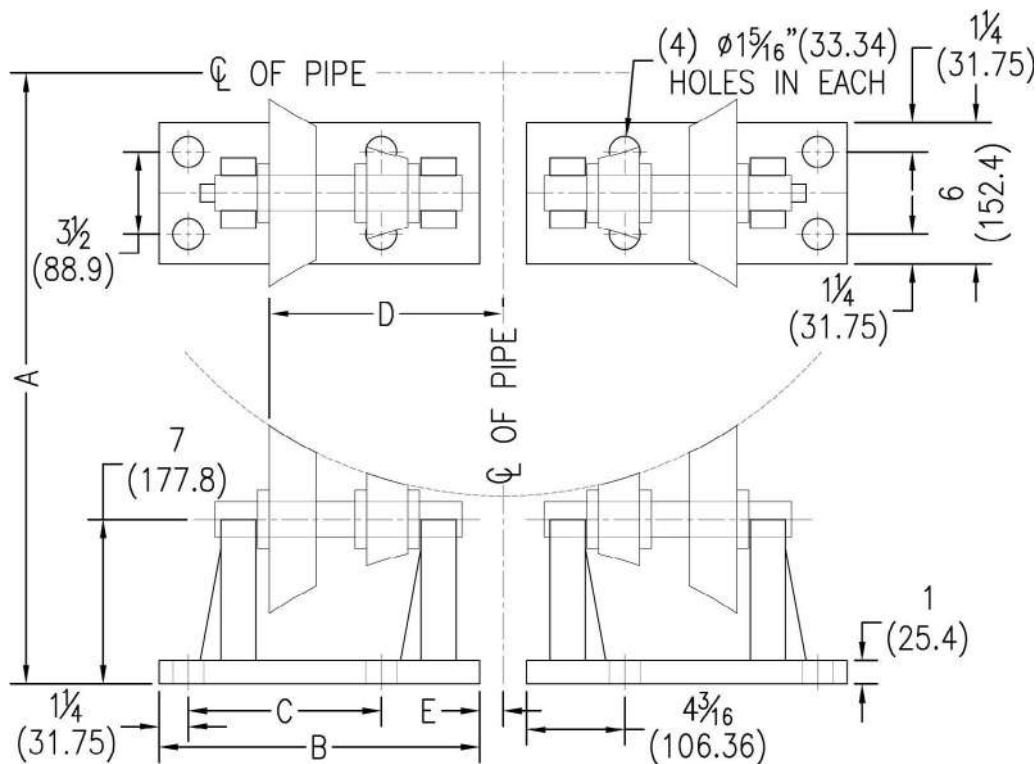
Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

PIPE ROLLER SUPPORTS

FIG. 488

FABRICATED ROLLER FOR LARGE PIPING

- Function:** Designed to support pipe in applications where horizontal movement, due to expansion and contraction, will occur.
- Sizing:** Pipe roller size shown for bare pipe.
- Material:** Carbon steel
- Finish:** Plain or electro-galvanized
- Ordering:** Specify figure number and finish.



Pipe Size		A		B		C		D		E		Max. Rec. Load		Wt. Each	
												lbs.	kN	lbs.	kg
30	(750)	23 1/4	(590.55)	13 5/8	(346.08)	8 3/16	(207.96)	8 13/16	(223.84)	0	(0)	60000	(266.89)	142	(64.41)
36	(900)	26	(660.40)	13 5/8	(346.08)	8 3/16	(207.96)	9 15/16	(252.41)	1	(25.40)	60000	(266.89)	142	(64.41)
42	(1050)	28 15/16	(735.01)	13 5/8	(346.08)	8 3/16	(207.96)	10 15/16	(277.81)	2	(50.80)	60000	(266.89)	142	(64.41)
46	(1150)	30 7/8	(784.23)	13 5/8	(346.08)	8 3/16	(207.96)	11 7/16	(290.51)	2 7/16	(61.91)	60000	(266.89)	142	(64.41)
46	(1150)	31 1/8	(790.58)	16 1/4	(412.75)	10 13/16	(274.64)	12 7/8	(327.03)	1 1/4	(31.75)	60000	(266.89)	186	(84.37)
48	(1200)	32	(812.80)	16 1/4	(412.75)	10 13/16	(274.64)	13 1/4	(336.55)	1 11/16	(42.86)	60000	(266.89)	186	(84.37)
54	(1350)	34 7/8	(885.83)	16 1/4	(412.75)	10 13/16	(274.64)	14 5/16	(363.54)	2 3/4	(69.85)	60000	(266.89)	186	(84.37)
60	(1500)	37 3/4	(958.85)	16 1/4	(412.75)	10 13/16	(274.64)	15 7/8	(403.23)	3 15/16	(100.01)	60000	(266.89)	186	(84.37)
66	(1650)	40 9/16	(1030.29)	16 1/4	(412.75)	10 13/16	(274.64)	16 1/2	(419.10)	5	(127.00)	60000	(266.89)	186	(84.37)
72	(1800)	43 3/8	(1101.73)	16 1/4	(412.75)	10 13/16	(274.64)	17 5/8	(447.68)	6 1/16	(153.99)	60000	(266.89)	186	(84.37)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

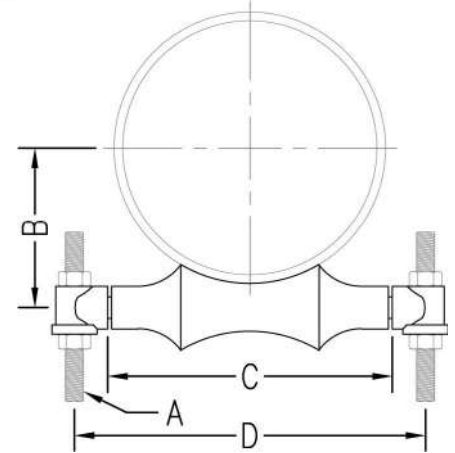
PIPE ROLLER SUPPORTS



PIPE ROLLER WITH SOCKETS

FIG. 490

- Function:** Designed to support pipe in applications where horizontal movement, due to expansion and contraction, will occur.
- Sizing:** Pipe roller size shown is for bare pipe. For proper sizing with insulation, refer to pipe roller selection guide, which is for use with pipe covering protection saddles.
- Material:** Cast iron pipe roller and sockets with carbon steel axle.
- Finish:** Plain or electro-galvanized (Hot dipped galvanized with electro-galvanized hardware upon request)
- Approvals:** Complies with Federal Specification A-A-1192A (Type 41) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 41) which supersedes ANSI/MSS SP-69.
- Ordering:** Specify figure number, pipe roller size, and finish.



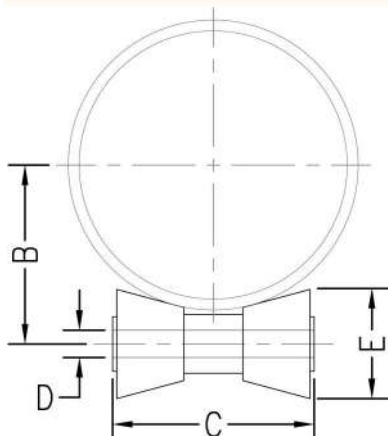
Pipe Roller Size		Rod Size A	B		C		D		Max. Rec. Load		Wt. Each	
									lbs.	kN	lbs.	kg
2	(50)	3/8	1 5/8	(41.28)	2 7/8	(73.03)	4 1/2	(114.30)	600	(2.67)	.57	(.26)
2 1/2	(65)	1/2	2	(50.80)	3 1/8	(79.38)	5 1/16	(128.59)	660	(2.94)	.98	(.44)
3	(80)	1/2	2 1/4	(57.15)	3 3/4	(95.25)	5 9/16	(141.29)	700	(3.11)	1.10	(.50)
3 1/2	(90)	1/2	2 5/8	(66.68)	4 1/4	(107.95)	6 1/16	(153.99)	750	(3.34)	1.36	(.62)
4	(100)	5/8	2 3/4	(69.85)	4 3/4	(120.65)	6 3/4	(171.45)	750	(3.34)	1.62	(.73)
5	(125)	5/8	3 1/2	(88.90)	5 3/4	(146.05)	8 3/8	(212.73)	750	(3.34)	2.60	(1.18)
6	(150)	3/4	4	(101.60)	6 7/8	(174.63)	9 7/8	(250.83)	1070	(4.76)	4.42	(2.00)
8	(200)	7/8	5 1/8	(130.18)	8 7/8	(225.43)	12	(304.80)	1350	(6.01)	7.20	(3.27)
10	(250)	7/8	6 3/8	(161.93)	11	(279.40)	14	(355.60)	1730	(7.70)	9.50	(4.31)
12	(300)	7/8	7 1/2	(190.50)	13	(330.20)	16 1/2	(419.10)	2400	(10.68)	16.00	(7.26)
14	(350)	1	8 3/8	(212.73)	14 3/8	(365.13)	17 3/4	(450.85)	3130	(13.92)	24.20	(10.98)
16	(400)	1	9 1/2	(241.30)	16 3/8	(415.93)	20 3/4	(527.05)	3970	(17.66)	31.80	(14.42)
18	(450)	1	10 1/2	(266.70)	18 3/8	(466.73)	22 3/8	(568.33)	4200	(18.68)	35.15	(15.94)
20	(500)	1 1/4	11 5/8	(295.28)	20 3/8	(517.53)	24 1/2	(622.30)	4550	(20.24)	47.00	(21.32)
24	(600)	1 1/2	14	(355.60)	24 3/8	(619.13)	28 13/16	(731.84)	6160	(27.40)	76.20	(34.56)
30	(750)	1 1/2	17 1/2	(444.50)	30 3/8	(771.53)	35	(889.00)	7290	(32.43)	130.00	(58.97)

"B" (Center of axle to center of pipe)

PIPE ROLLER SUPPORTS

FIG. 485

SHORT PIPE ROLLER



Function: Designed for supporting pipe in applications where horizontal movement, due to expansion and contraction, will occur.

Material: Cast iron (Type 304 or 316 Stainless Steel upon request)

Finish: Plain or electro-galvanized (Hot dipped galvanized upon request)

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

Pipe Roller Size		B		C		Hole Size D		E		Max. Rec. Load		Wt. Each	
										lbs.	kN	lbs.	kg
2	(50)	1 ³ / ₁₆	(46.04)	2 ³ / ₄	(69.85)	9/ ₁₆	(14.29)	1 ⁵ / ₁₆	(49.21)	390	(1.73)	0.81	(0.37)
2½	(65)	2 ¹ / ₈	(53.98)	2 ³ / ₄	(69.85)	9/ ₁₆	(14.29)	1 ⁵ / ₁₆	(49.21)	390	(1.73)	0.81	(0.37)
3	(80)	2 ⁷ / ₁₆	(61.91)	2 ³ / ₄	(69.85)	9/ ₁₆	(14.29)	1 ⁵ / ₁₆	(49.21)	390	(1.73)	0.81	(0.37)
3½	(90)	2 ¹¹ / ₁₆	(68.26)	2 ³ / ₄	(69.85)	9/ ₁₆	(14.29)	1 ⁵ / ₁₆	(49.21)	390	(1.73)	0.81	(0.37)
4	(100)	3	(76.20)	3 ³ / ₄	(95.25)	9/ ₁₆	(14.29)	2 ¹ / ₄	(57.15)	950	(4.23)	0.94	(0.42)
5	(125)	3 ⁹ / ₁₆	(90.49)	3 ³ / ₄	(95.25)	9/ ₁₆	(14.29)	2 ¹ / ₄	(57.15)	950	(4.23)	0.94	(0.42)
6	(150)	4 ¹ / ₈	(104.78)	3 ³ / ₄	(95.25)	9/ ₁₆	(14.29)	2 ¹ / ₄	(57.15)	950	(4.23)	0.94	(0.42)
8	(200)	5 ¹ / ₄	(133.35)	6	(152.40)	1 ³ / ₁₆	(20.64)	3 ³ / ₁₆	(80.96)	2100	(9.34)	3.19	(1.45)
10	(250)	6 ³ / ₈	(161.93)	6	(152.40)	1 ³ / ₁₆	(20.64)	3 ³ / ₁₆	(80.96)	2100	(9.34)	3.19	(1.45)
12	(300)	7 ¹ / ₂	(190.50)	8	(203.20)	1	(25.40)	4	(101.60)	3075	(13.68)	6.64	(3.01)
14	(350)	8 ³ / ₁₆	(207.96)	8	(203.20)	1	(25.40)	4	(101.60)	3075	(13.68)	6.64	(3.01)
16	(400)	9 ⁵ / ₁₆	(236.54)	9	(228.60)	1 ¹ / ₄	(31.75)	4 ¹ / ₂	(114.30)	4980	(22.15)	8.31	(3.77)
18	(450)	10 ³ / ₈	(263.53)	9	(228.60)	1 ¹ / ₄	(31.75)	4 ¹ / ₂	(114.30)	4980	(22.15)	8.31	(3.77)
20	(500)	11 ⁷ / ₁₆	(290.51)	9	(228.60)	1 ¹ / ₄	(31.75)	4 ¹ / ₂	(114.30)	4980	(22.15)	8.31	(3.77)
24	(600)	13 ⁷ / ₁₆	(341.31)	10	(254.00)	1 ¹ / ₂	(38.10)	4 ³ / ₈	(111.13)	6100	(27.13)	8.40	(3.81)
30	(750)	16 ⁹ / ₁₆	(420.69)	12 ¹ / ₄	(311.15)	1 ⁷ / ₈	(47.63)	5 ³ / ₁₆	(131.76)	7500	(33.36)	14.40	(6.53)
36	(900)	19 ¹¹ / ₁₆	(500.06)	14	(355.60)	2 ¹ / ₈	(53.98)	6	(152.40)	12000	(53.38)	16.80	(7.62)
42	(1050)	22 ³ / ₄	(577.85)	14	(355.60)	2 ¹ / ₈	(53.98)	6	(152.40)	12000	(53.38)	16.80	(7.62)

PIPE ROLLER SUPPORTS



LONG PIPE ROLLER

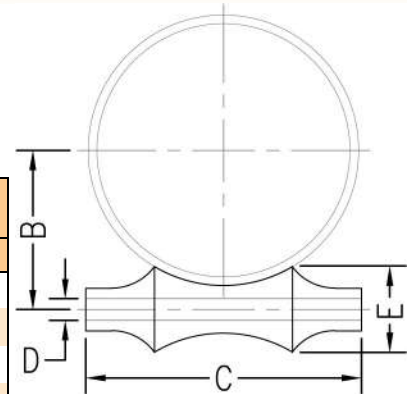
FIG. 495

Function: Designed for supporting pipe in applications where horizontal movement, due to expansion and contraction, will occur.

Material: Cast iron (Type 304 or 316 Stainless Steel upon request)

Finish: Plain or electro-galvanized (Hot dipped galvanized upon request)

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



Pipe Roller Size		B		C		Hole Size D		E		Max. Rec. Load		Wt. Each	
										lbs.	kN	lbs.	kg
2	(50)	1 ⁵ / ₈	(41.28)	2 ⁷ / ₈	(73.03)	7 ¹ / ₁₆	(11.11)	1 ³ / ₁₆	(30.16)	600	(2.67)	0.22	(0.10)
2 ¹ / ₂	(65)	2	(50.80)	3 ¹ / ₈	(79.38)	9 ¹ / ₁₆	(14.29)	1 ⁷ / ₁₆	(36.51)	700	(3.11)	0.33	(0.15)
3	(80)	2 ¹ / ₄	(57.15)	3 ³ / ₄	(95.25)	9 ¹ / ₁₆	(14.29)	1 ¹ / ₂	(38.10)	700	(3.11)	0.43	(0.20)
3 ¹ / ₂	(90)	2 ⁵ / ₈	(66.68)	4 ¹ / ₄	(107.95)	9 ¹ / ₁₆	(14.29)	1 ⁵ / ₈	(41.28)	750	(3.34)	0.53	(0.24)
4	(100)	2 ³ / ₄	(69.85)	4 ³ / ₄	(120.65)	9 ¹ / ₁₆	(14.29)	2	(50.80)	750	(3.34)	0.56	(0.26)
5	(125)	3 ¹ / ₂	(88.90)	5 ³ / ₄	(146.05)	11 ¹ / ₁₆	(17.46)	2 ¹ / ₈	(53.98)	750	(3.34)	0.94	(0.43)
6	(150)	4	(101.60)	6 ⁷ / ₈	(174.63)	13 ¹ / ₁₆	(20.64)	2 ⁷ / ₁₆	(61.91)	1100	(4.89)	1.59	(0.72)
8	(200)	5 ¹ / ₈	(130.18)	8 ⁷ / ₈	(225.43)	15 ¹ / ₁₆	(23.81)	2 ⁷ / ₈	(73.03)	1350	(6.01)	2.64	(1.20)
10	(250)	6 ³ / ₈	(161.93)	11	(279.40)	15 ¹ / ₁₆	(23.81)	3 ¹ / ₂	(88.90)	1750	(7.78)	4.50	(2.04)
12	(300)	7 ¹ / ₂	(190.50)	13	(330.20)	15 ¹ / ₁₆	(23.81)	4 ¹ / ₄	(107.95)	2400	(10.68)	7.55	(3.42)
14	(350)	8 ³ / ₈	(212.73)	14 ³ / ₈	(365.13)	1 ¹ / ₄	(31.75)	4 ⁵ / ₈	(117.48)	3100	(13.79)	13.00	(5.90)
16	(400)	9 ¹ / ₂	(241.30)	16 ³ / ₈	(415.93)	1 ³ / ₈	(34.93)	4 ⁷ / ₈	(123.83)	4000	(17.79)	17.44	(7.91)
18	(450)	10 ¹ / ₂	(266.70)	18 ³ / ₈	(466.73)	1 ³ / ₈	(34.93)	5 ⁵ / ₁₆	(134.94)	4200	(18.68)	21.60	(9.80)
20	(500)	11 ⁵ / ₈	(295.28)	20 ³ / ₈	(517.53)	1 ³ / ₈	(34.93)	6 ¹ / ₁₆	(153.99)	4550	(20.24)	27.13	(12.30)
24	(600)	14	(355.60)	14 ³ / ₈	(365.13)	1 ⁵ / ₈	(41.28)	7 ¹ / ₁₆	(179.39)	6100	(27.13)	43.29	(19.63)
30	(750)	17 ¹ / ₂	(444.50)	30 ³ / ₈	(771.53)	1 ⁷ / ₈	(47.63)	9 ¹ / ₁₆	(230.19)	7300	(32.47)	82.00	(37.19)

ROLLER SOCKET

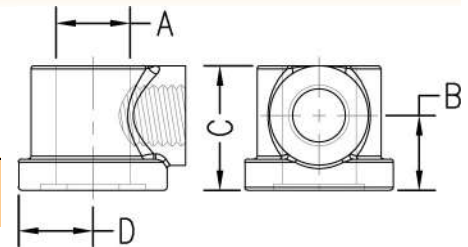
FIG. 496

Function: Designed for use with Fig. 495.

Material: Cast iron

Finish: Plain or electro-galvanized (Hot dipped galvanized upon request)

Ordering: Specify figure number, socket number, and finish.



Socket Number	Rod Size A	Use with Pipe Roller Size	Axle Size	B		C		D		Wt. Each	
										lbs.	kg
1	3 ⁸ / ₁₆	2	3 ⁸ / ₁₆	5 ⁸ / ₁₆	(15.88)	1	(25.40)	11 ¹ / ₁₆	(17.46)	.12	(.05)
2	1 ¹ / ₂	2 ¹ / ₂ to 3 ¹ / ₂	1 ¹ / ₂	3 ⁴ / ₁₆	(19.05)	1 ¹ / ₄	(31.75)	11 ¹ / ₁₆	(17.46)	.27	(.12)
2A	5 ⁸ / ₁₆	4	1 ¹ / ₂	7 ⁸ / ₁₆	(22.23)	1 ¹ / ₄	(31.75)	13 ¹ / ₁₆	(20.64)	.25	(.11)
3	5 ⁸ / ₁₆	5	5 ⁸ / ₁₆	1	(25.40)	1 ⁹ / ₁₆	(39.69)	1	(25.40)	.53	(.24)
4	3 ⁴ / ₁₆	6	3 ⁴ / ₁₆	1 ¹ / ₄	(31.75)	1 ¹³ / ₁₆	(46.04)	1 ¹ / ₈	(28.58)	.92	(.42)
5	7 ⁸ / ₁₆	8 to 12	7 ⁸ / ₁₆	1 ¹ / ₄	(31.75)	2 ¹ / ₈	(53.98)	1 ¹ / ₈	(28.58)	1.44	(.65)
7	1	14	1 ¹ / ₈	1 ³ / ₄	(44.45)	2 ³ / ₈	(60.33)	1 ³ / ₈	(34.93)	2.03	(.92)
8	1	16 to 18	1 ¹ / ₄	1 ¹³ / ₁₆	(46.04)	3	(76.20)	1 ⁵ / ₈	(41.28)	2.60	(1.18)
8A	1 ¹ / ₄	20	1 ¹ / ₄	1 ¹³ / ₁₆	(46.04)	3	(76.20)	1 ⁵ / ₈	(41.28)	2.56	(1.16)
9B	1 ¹ / ₂	24	1 ¹ / ₂	2 ³ / ₁₆	(55.56)	3 ³ / ₈	(85.73)	2 ¹ / ₁₆	(52.39)	4.96	(2.25)
10	1 ¹ / ₂	30	1 ³ / ₄	2 ⁹ / ₁₆	(65.09)	4	(101.60)	2 ⁵ / ₁₆	(58.74)	6.94	(3.15)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

PIPE ROLLER SELECTION GUIDE

For use with pipe covering protection saddle, figures 651-658 .

Pipe Thickness		Insulation Thickness		Pipe Roller Size		
				Use with Fig. No.		
				460, 480, 483 & 490	470 & 475	486 & 487
1/2	(15)	1 (25.4)	2 (50.8)	2	2 1/2	2 - 3 1/2
		1 1/2 (38.1)	3 (76.2)	3	3 1/2	2 - 3 1/2
		2 (50.8)	4 (101.6)	4	5	2 - 3 1/2
3/4	(20)	1 (25.4)	2 (50.8)	2	2 1/2	2 - 3 1/2
		1 1/2 (38.1)	3 (76.2)	3	3 1/2	2 - 3 1/2
		2 (50.8)	4 (101.6)	4	5	2 - 3 1/2
1	(25)	1 (25.4)	2 (50.8)	2 1/2	3	2 - 3 1/2
		1 1/2 (38.1)	3 (76.2)	3	4	2 - 3 1/2
		2 (50.8)	4 (101.6)	4	5	2 - 3 1/2
1 1/4	(32)	1 (25.4)	2 (50.8)	2 1/2	3	2 - 3 1/2
		1 1/2 (38.1)	3 (76.2)	3 1/2	5	2 - 3 1/2
		2 (50.8)	4 (101.6)	4	5	2 - 3 1/2
		2 1/2 (63.5)	5 (127)	5	6	4 - 6
1 1/2	(40)	1 (25.4)	2 (50.8)	3	3 1/2	2 - 3 1/2
		1 1/2 (38.1)	3 (76.2)	3 1/2	5	2 - 3 1/2
		2 (50.8)	4 (101.6)	5	6	4 - 6
		2 1/2 (63.5)	5 (127)	6	8	4 - 6
2	(50)	1 (25.4)	2 (50.8)	3 1/2	4	2 - 3 1/2
		1 1/2 (38.1)	3 (76.2)	4	5	2 - 3 1/2
		2 (50.8)	4 (101.6)	5	6	4 - 6
		2 1/2 (63.5)	5 (127)	6	8	4 - 6
		3 (76.2)	6 (152.4)	8	8	4 - 6
		4 (101.6)	8 (203.2)	8	10	8 - 10
2 1/2	(65)	1 (25.4)	2 (50.8)	3 1/2	5	2 - 3 1/2
		1 1/2 (38.1)	3 (76.2)	5	6	4 - 6
		2 (50.8)	4 (101.6)	6	8	4 - 6
		2 1/2 (63.5)	5 (127)	8	8	4 - 6
		3 (76.2)	6 (152.4)	10	10	4 - 6
		4 (101.6)	8 (203.2)	10	10	8 - 10
3	(80)	1 (25.4)	2 (50.8)	4	5	2 - 3 1/2
		1 1/2 (38.1)	3 (76.2)	5	6	4 - 6
		2 (50.8)	4 (101.6)	6	8	4 - 6
		2 1/2 (63.5)	5 (127)	8	8	4 - 6
		3 (76.2)	6 (152.4)	10	10	8 - 10
		4 (101.6)	8 (203.2)	12	12	8 - 10
3 1/2	(90)	1 (25.4)	2 (50.8)	5	6	4 - 6
		1 1/2 (38.1)	3 (76.2)	6	8	4 - 6
		2 (50.8)	4 (101.6)	8	8	4 - 6
		2 1/2 (63.5)	5 (127)	10	10	8 - 10
		3 (76.2)	6 (152.4)	10	10	8 - 10
		4 (101.6)	8 (203.2)	10	12	8 - 10
4	(100)	1 (25.4)	2 (50.8)	5	6	4 - 6
		1 1/2 (38.1)	3 (76.2)	6	8	4 - 6
		2 (50.8)	4 (101.6)	8	8	4 - 6
		2 1/2 (63.5)	5 (127)	10	10	8 - 10
		3 (76.2)	6 (152.4)	10	10	8 - 10
		4 (101.6)	8 (203.2)	10	12	8 - 10
5	(125)	1 (25.4)	2 (50.8)	6	8	4 - 6
		1 1/2 (38.1)	3 (76.2)	8	8	4 - 6
		2 (50.8)	4 (101.6)	10	10	8 - 10
		2 1/2 (63.5)	5 (127)	10	10	8 - 10
		3 (76.2)	6 (152.4)	10	12	8 - 10
		4 (101.6)	8 (203.2)	12	14	8 - 10

Pipe Thickness		Insulation Thickness		Pipe Roller Size		
				Use with Fig. No.		
				460, 480, 483 & 490	470 & 475	486 & 487
6	(150)	1 (25.4)	2 (50.8)	8	8	4 - 6
		1 1/2 (38.1)	3 (76.2)	8	10	8 - 10
		2 (50.8)	4 (101.6)	10	10	8 - 10
		2 1/2 (63.5)	5 (127)	10	12	8 - 10
		3 (76.2)	6 (152.4)	12	12	8 - 10
		4 (101.6)	8 (203.2)	14	16	12 - 14
8	(200)	1 (25.4)	2 (50.8)	10	12	8 - 10
		1 1/2 (38.1)	3 (76.2)	10	12	8 - 10
		2 (50.8)	4 (101.6)	10	12	8 - 10
		2 1/2 (63.5)	5 (127)	12	14	8 - 10
		3 (76.2)	6 (152.4)	14	16	12 - 14
		4 (101.6)	8 (203.2)	16	18	12 - 14
10	(250)	1 (25.4)	2 (50.8)	12	14	8 - 10
		1 1/2 (38.1)	3 (76.2)	12	14	8 - 10
		2 (50.8)	4 (101.6)	14	16	12 - 14
		2 1/2 (63.5)	5 (127)	14	16	12 - 14
		3 (76.2)	6 (152.4)	16	18	16 - 20
		4 (101.6)	8 (203.2)	18	20	16 - 20
12	(300)	1 (25.4)	2 (50.8)	14	16	12 - 14
		1 1/2 (38.1)	3 (76.2)	14	16	12 - 14
		2 (50.8)	4 (101.6)	16	18	16 - 20
		2 1/2 (63.5)	5 (127)	16	18	16 - 20
		3 (76.2)	6 (152.4)	18	20	16 - 20
		4 (101.6)	8 (203.2)	20	--	16 - 20
14	(350)	1 1/2 (38.1)	2 (50.8)	16	18	12 - 14
		2 (50.8)	3 (76.2)	16	18	16 - 20
		2 1/2 (63.5)	4 (101.6)	18	20	16 - 20
		3 (76.2)	5 (127)	18	20	16 - 20
		4 (101.6)	6 (152.4)	20	--	24
16	(400)	1 1/2 (38.1)	2 (50.8)	18	20	16 - 20
		2 (50.8)	3 (76.2)	18	20	16 - 20
		2 1/2 (63.5)	4 (101.6)	20	--	16 - 20
		3 (76.2)	5 (127)	20	--	24
		4 (101.6)	6 (152.4)	24	--	24
18	(450)	1 1/2 (38.1)	2 (50.8)	20	--	16 - 20
		2 (50.8)	3 (76.2)	20	--	24
		2 1/2 (63.5)	4 (101.6)	24	--	24
		3 (76.2)	5 (127)	24	--	24
		4 (101.6)	6 (152.4)	24	--	24
20	(500)	1 1/2 (38.1)	2 (50.8)	24	--	24
		2 (50.8)	3 (76.2)	24	--	24
		2 1/2 (63.5)	4 (101.6)	24	--	24
		3 (76.2)	5 (127)	24	--	24
		4 (101.6)	6 (152.4)	30	--	30
24	(600)	1 1/2 (38.1)	2 (50.8)	30	--	30
		2 (50.8)	3 (76.2)	30	--	30
		2 1/2 (63.5)	4 (101.6)	30	--	30
		3 (76.2)	5 (127)	30	--	30
30	(750)	1 1/2 (38.1)	2 (50.8)	--	--	36-42
		2 (50.8)	3 (76.2)	--	--	36-42
		2 1/2 (63.5)	4 (101.6)	--	--	36-42
		3 (76.2)	5 (127)	--	--	36-42
		4 (101.6)	6 (152.4)	--	--	36-42
36	(900)	1 1/2 (38.1)	2 (50.8)	--	--	36-42
		2 (50.8)	3 (76.2)	--	--	36-42
		2 1/2 (63.5)	4 (101.6)	--	--	36-42
		3 (76.2)	5 (127)	--	--	36-42
		4 (101.6)	6 (152.4)	--	--	36-42

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

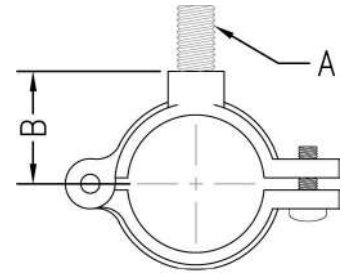
SPLIT RING HANGERS



HINGED EXTENSION SPLIT CLAMP

FIG. 508R

- Function:** Designed for non-insulated stationary pipe lines in either a horizontal or vertical position. The hinged design allows for a quick installation.
- Material:** Malleable iron
- Finish:** Plain or electro-galvanized
- Approvals:** Complies with Federal Specification A-A-1192A (Type 12) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 12) which supersedes ANSI/MSS SP-69.
- Ordering:** Specify figure number, pipe size, and finish.

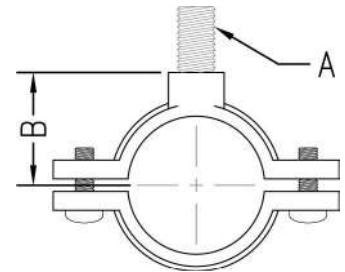


Pipe Size		Bolt Thread A	B		Max. Rec. Load		Wt. Each	
					lbs.	kN	lbs.	kg
3/8	(10)	3/8	13/16	(20.64)	180	(0.80)	.13	(.06)
1/2	(15)	3/8	7/8	(22.23)	180	(0.80)	.14	(.06)
3/4	(20)	3/8	1	(25.40)	180	(0.80)	.16	(.07)
1	(25)	3/8	1 1/8	(28.58)	180	(0.80)	.18	(.08)
1 1/4	(32)	3/8	1 5/16	(33.34)	180	(0.80)	.22	(.10)
1 1/2	(40)	3/8	1 7/16	(36.51)	180	(0.80)	.38	(.17)
2	(50)	3/8	1 11/16	(42.86)	180	(0.80)	.44	(.20)
2 1/2	(65)	1/2	2 1/8	(53.98)	300	(1.33)	.45	(.20)
3	(80)	1/2	2 7/16	(61.91)	300	(1.33)	.55	(.25)
4	(100)	1/2	3	(76.20)	300	(1.33)	.95	(.43)

EXTENSION SPLIT CLAMP

FIG. 510R

- Function:** Designed for non-insulated stationary pipe lines in either a horizontal or vertical position.
- Material:** Malleable iron (Type 304 or 316 Stainless Steel upon request)
- Finish:** Plain or electro-galvanized
- Approvals:** Complies with Federal Specification A-A-1192A (Type 12) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 12) which supersedes ANSI/MSS SP-69.
- Ordering:** Specify figure number, pipe size, material, and finish.



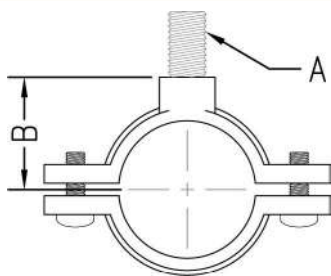
Pipe Size		Bolt Thread A	B		Max. Rec. Load		Wt. Each	
					lbs.	kN	lbs.	kg
3/8	(10)	3/8	13/16	(20.64)	180	(0.80)	.13	(.06)
1/2	(15)	3/8	7/8	(22.23)	180	(0.80)	.14	(.06)
3/4	(20)	3/8	1	(25.40)	180	(0.80)	.16	(.07)
1	(25)	3/8	1 1/8	(28.58)	180	(0.80)	.18	(.08)
1 1/4	(32)	3/8	1 5/16	(33.34)	180	(0.80)	.22	(.10)
1 1/2	(40)	3/8	1 7/16	(36.51)	180	(0.80)	.38	(.17)
2	(50)	3/8	1 11/16	(42.86)	180	(0.80)	.44	(.20)
2 1/2	(65)	1/2	2 1/8	(53.98)	300	(1.33)	.45	(.20)
3	(80)	1/2	2 7/16	(61.91)	300	(1.33)	.55	(.25)
4	(100)	1/2	3 11/32	(84.93)	300	(1.33)	.70	(.32)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

SPLIT RING HANGERS

FIG. 512

COPPER TUBING EXTENSION SPLIT CLAMP



Function: Designed for non-insulated stationary tubing lines in either a horizontal or vertical position.

Material: Malleable iron

Finish: Copper color epoxy finish

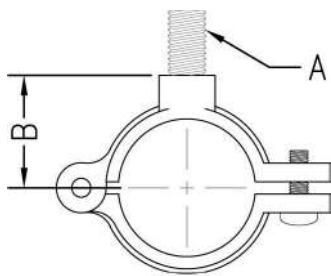
Approvals: Complies with Federal Specification A-A-1192A (Type 12) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 12) which supersedes ANSI/MSS SP-69.

Ordering: Specify figure number and pipe size.

Tube Size	Bolt Thread A	B		Max. Rec. Load		Wt. Each	
				lbs.	kN	lbs.	kg
3/8 (10)	3/8	9/16	(14.29)	180	(0.80)	.07	(.03)
1/2 (15)	3/8	11/16	(17.46)	180	(0.80)	.09	(.04)
3/4 (20)	3/8	7/8	(22.23)	180	(0.80)	.09	(.04)
1 (25)	3/8	1	(25.40)	180	(0.80)	.10	(.05)
1 1/4 (32)	3/8	1 1/8	(28.58)	180	(0.80)	.12	(.05)
1 1/2 (40)	3/8	1 5/16	(33.34)	180	(0.80)	.13	(.06)
2 (50)	3/8	1 1/2	(38.10)	180	(0.80)	.18	(.08)
2 1/2 (65)	1/2	1 7/8	(47.63)	300	(1.33)	.65	(.29)
3 (80)	1/2	2 1/8	(53.98)	300	(1.33)	1.00	(.45)
4 (100)	1/2	2 3/4	(69.85)	300	(1.33)	1.40	(.64)

FIG. 512H

HINGED COPPER TUBING EXTENSION SPLIT CLAMP



Function: Designed for non-insulated stationary tubing lines in either a horizontal or vertical position. The hinged design of Fig. 512H allows for a quicker installation.

Material: Malleable iron

Finish: Copper color epoxy finish

Approvals: Complies with Federal Specification A-A-1192A (Type 12) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 12) which supersedes ANSI/MSS SP-69.

Ordering: Specify figure number and pipe size.

Tube Size	Bolt Thread A	B		Max. Rec. Load		Wt. Each	
				lbs.	kN	lbs.	kg
3/8 (10)	3/8	9/16	(14.29)	180	(0.80)	.08	(.04)
1/2 (15)	3/8	11/16	(17.46)	180	(0.80)	.09	(.04)
3/4 (20)	3/8	7/8	(22.23)	180	(0.80)	.12	(.05)
1 (25)	3/8	1	(25.40)	180	(0.80)	.11	(.05)
1 1/4 (32)	3/8	1 1/8	(28.58)	180	(0.80)	.15	(.07)
1 1/2 (40)	3/8	1 5/16	(33.34)	180	(0.80)	.20	(.09)
2 (50)	3/8	1 1/2	(38.10)	180	(0.80)	.25	(.11)
2 1/2 (65)	1/2	1 7/8	(47.63)	300	(1.33)	.45	(.20)
3 (80)	1/2	2 1/8	(53.98)	300	(1.33)	.55	(.25)
4 (100)	1/2	2 3/4	(69.85)	300	(1.33)	.90	(.41)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

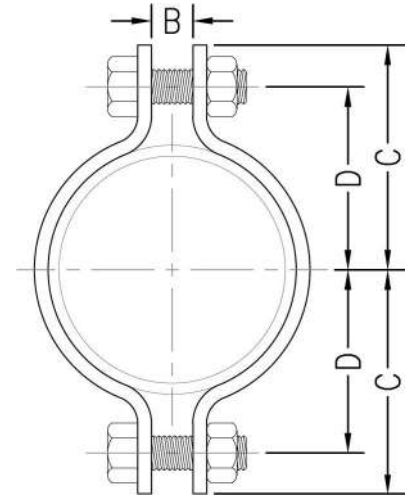
PIPE CLAMPS



STANDARD PIPE CLAMP

FIG. 520 & 521

- Function:** Designed to be used in the suspension of non-insulated pipe lines. Normally used in conjunction with Fig. 35 weldless eye nut, Fig. 50 eye rod or Fig. 55 welded eye rod to allow flexibility at the rod attachment.
- Material:** Carbon steel (Type 304 or 316 Stainless Steel upon request)
- Finish:** Plain (**Fig. 520**) or electro-galvanized (**Fig. 521**) (Hot dipped galvanized with electro-galvanized hardware upon request)
- Approvals:** Complies with Federal Specification A-A-1192A (Type 4) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 4) which supersedes ANSI/MSS SP-69.
- Ordering:** Specify figure number, pipe size, material, and finish.



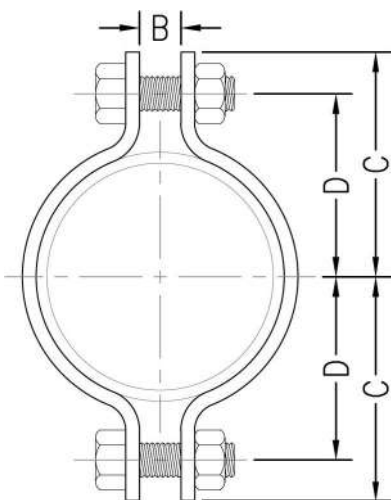
Pipe Size		B		C		D		Bolt Size	Max. Rec. Load				Wt. Each	
									650°F (343°C)		750°F (399°C)			
									lbs.	kN	lbs.	kN	lbs.	kg
½	(15)	⅜	(9.53)	1⅞	(39.69)	1⅛	(26.99)	⅜	500	(2.22)	445	(1.98)	.31	(.14)
¾	(20)	⅜	(9.53)	1¾	(44.45)	1¼	(31.75)	⅜	500	(2.22)	445	(1.98)	.35	(.16)
1	(25)	⅜	(9.53)	1⅞	(47.63)	1⅜	(34.93)	⅜	500	(2.22)	445	(1.98)	.39	(.18)
1¼	(32)	⅜	(9.53)	2⅛	(53.98)	1⅝	(41.28)	⅜	500	(2.22)	445	(1.98)	.40	(.18)
1½	(40)	⅜	(9.53)	2¼	(57.15)	1¾	(44.45)	⅜	800	(3.56)	715	(3.18)	.45	(.20)
2	(50)	½	(12.70)	2⅞	(65.09)	2⅛	(52.39)	½	1040	(4.63)	930	(4.14)	.90	(.41)
2½	(65)	⅝	(15.88)	2⅓	(71.44)	2⅝	(58.74)	½	1040	(4.63)	930	(4.14)	1.10	(.50)
3	(80)	⅝	(15.88)	3⅝	(84.14)	2⅓	(71.44)	½	1040	(4.63)	930	(4.14)	1.20	(.54)
3½	(90)	⅝	(15.88)	3½	(88.90)	3⅓	(80.96)	½	1040	(4.63)	930	(4.14)	1.25	(.57)
4	(100)	¾	(19.05)	4⅛	(104.78)	3⅜	(85.73)	⅝	1040	(4.63)	930	(4.14)	1.85	(.84)
5	(125)	¾	(19.05)	4¾	(120.65)	4	(101.60)	⅝	1040	(4.63)	930	(4.14)	2.05	(.93)
6	(150)	⅞	(22.23)	5⅞	(149.23)	4⅞	(123.83)	¾	1615	(7.18)	1440	(6.41)	5.06	(2.30)
8	(200)	1	(25.40)	7	(177.80)	6	(152.40)	¾	1615	(7.18)	1440	(6.41)	6.08	(2.76)
10	(250)	1	(25.40)	8⅓	(223.84)	7⅞	(192.09)	⅞	2490	(11.08)	2220	(9.88)	12.81	(5.81)
12	(300)	1	(25.40)	9⅞	(250.83)	8⅞	(225.43)	⅞	2490	(11.08)	2220	(9.88)	13.08	(5.93)
14	(350)	1⅛	(28.58)	11⅝	(287.34)	9⅝	(252.41)	⅞	2490	(11.08)	2220	(9.88)	16.70	(7.57)
16	(400)	1⅛	(28.58)	12⅝	(320.68)	10⅞	(276.23)	⅞	2490	(11.08)	2220	(9.88)	23.19	(10.52)
18	(450)	1¼	(31.75)	13⅜	(339.73)	11⅝	(295.28)	1	3060	(13.61)	2730	(12.14)	33.12	(15.02)
20	(500)	1⅜	(34.93)	14⅝	(363.54)	12⅞	(319.09)	1⅛	3060	(13.61)	2730	(12.14)	38.66	(17.54)
24	(600)	1⅝	(41.28)	17¼	(438.15)	15½	(393.70)	1¼	3060	(13.61)	2730	(12.14)	52.27	(23.71)
30	(750)	2	(50.80)	20⅞	(530.23)	18⅝	(473.08)	1½	4000	(17.79)	3520	(15.66)	105.13	(47.69)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

PIPE CLAMPS

FIG. 522

HEAVY DUTY PIPE CLAMP



- Function:** Designed to be used in the suspension of non-insulated pipe lines where heavier loads are to be suspended. Normally used in conjunction with Fig. 35 weldless eye nut or Fig. 55 welded eye rod to allow flexibility at the rod attachment.
- Material:** Carbon steel (Type 304 or 316 Stainless Steel upon request)
- Finish:** Plain or electro-galvanized (Hot dipped galvanized with electro-galvanized hardware upon request)
- Approvals:** Complies with Federal Specification A-A-1192A (Type 4) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 4) which supersedes ANSI/MSS SP-69.
- Ordering:** Specify figure number, pipe size, material, and finish.

Pipe Size		B		C		D		Bolt Size	Max. Rec. Load				Wt. Each	
									650°F (343°C)		750°F (399°C)			
									lbs.	kN	lbs.	kN	lbs.	kg
3	(80)	1	(25.40)	4 ¹ / ₈	(104.78)	3 ¹ / ₈	(79.38)	¾	3370	(14.99)	3005	(13.37)	4.96	(2.25)
3½	(90)	1	(25.40)	4¾	(111.13)	3¾	(85.73)	¾	3370	(14.99)	3005	(13.37)	5.36	(2.43)
4	(100)	1	(25.40)	4 ¹⁵ / ₁₆	(125.41)	3 ¹⁵ / ₁₆	(100.01)	7/8	3515	(15.64)	3135	(13.95)	5.74	(2.60)
5	(125)	1	(25.40)	5 ⁹ / ₁₆	(141.29)	4 ⁹ / ₁₆	(115.89)	7/8	3515	(15.64)	3135	(13.95)	7.13	(3.23)
6	(150)	1½	(28.58)	6 ¹¹ / ₁₆	(169.86)	5¾	(131.76)	1	4865	(21.64)	4340	(19.31)	13.48	(6.11)
8	(200)	1½	(28.58)	7 ⁵ / ₈	(193.68)	6½	(155.58)	1	4865	(21.64)	4340	(19.31)	16.42	(7.45)
10	(250)	1¼	(31.75)	9¾	(233.36)	7 ¹¹ / ₁₆	(195.26)	1¼	6010	(26.73)	5360	(23.84)	15.86	(7.19)
12	(300)	1⅝	(41.28)	11	(279.40)	9½	(231.78)	1½	8675	(38.59)	7740	(34.43)	44.50	(20.18)
14	(350)	1⅝	(41.28)	11⅞	(301.63)	9¾	(247.65)	1½	9120	(40.57)	8135	(36.19)	53.25	(24.15)
16	(400)	1⅝	(41.28)	12⅞	(327.03)	10¾	(273.05)	1½	9120	(40.57)	8135	(36.19)	58.46	(26.52)
18	(450)	3	(76.20)	17¼	(438.15)	14½	(368.30)	2	13800	(61.39)	12280	(54.62)	132.16	(59.95)
20	(500)	3	(76.20)	18¾	(476.25)	16	(406.40)	2	15300	(68.06)	13620	(60.58)	153.84	(69.78)
24	(600)	3¼	(82.55)	21½	(546.10)	18½	(469.90)	2¼	16300	(72.51)	14500	(64.50)	219.80	(99.70)
28	(700)	3¼	(82.55)	23½	(596.90)	20½	(520.70)	2¼	18000	(80.07)	-	-	302.8	(137.35)
30	(750)	3½	(88.90)	26	(660.40)	22½	(571.50)	2½	20500	(91.19)	-	-	365.4	(165.74)
32	(800)	3½	(88.90)	27	(685.80)	23½	(596.90)	2½	23750	(105.65)	-	-	431.7	(195.82)
34	(850)	3½	(88.90)	28½	(723.90)	25	(635.00)	2½	25000	(111.21)	-	-	533.8	(242.13)
36	(900)	3½	(88.90)	30¼	(768.35)	26½	(673.10)	2¾	28000	(124.55)	-	-	575.1	(260.86)
42	(1050)	3½	(88.90)	33¾	(857.25)	30	(762.00)	2¾	35000	(155.69)	-	-	915.7	(415.35)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

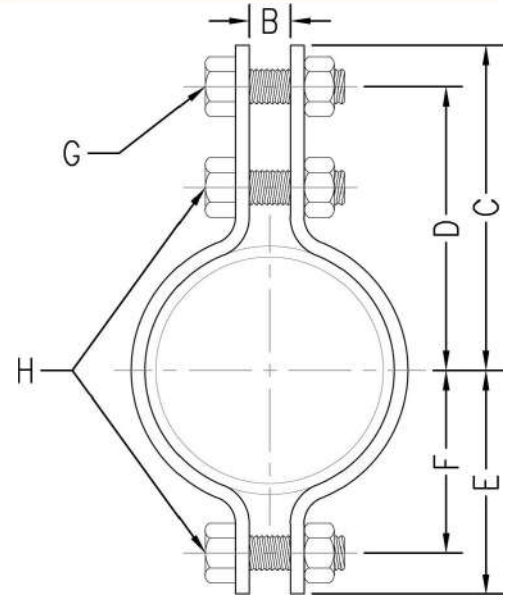
PIPE CLAMPS



DOUBLE BOLT PIPE CLAMP

FIG. 525

- Function:** Designed for the suspension of high temperature insulated pipe lines. Normally used in conjunction with Fig. 35 weldless eye nut or Fig. 55 welded eye rod to allow flexibility at the rod attachment. The clamp can be used with up to 4 inches (101.6mm) of insulation and temperatures up to 750° F (399° C).
- Material:** Carbon steel (Type 304 or 316 Stainless Steel upon request)
- Finish:** Plain or electro-galvanized (Hot dipped galvanized with electro-galvanized hardware upon request)
- Approvals:** Complies with Federal Specification A-A-1192A (Type 3) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 3) which supersedes ANSI/MSS SP-69.
- Ordering:** Specify figure number, pipe size, material, and finish.



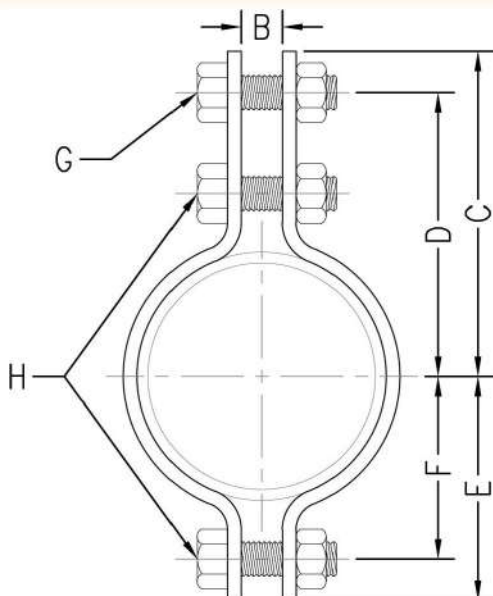
Pipe Size		B		C		D		E		F		Bolt Size		Max. Rec. Load				Wt. Each	
														650°F (343°C)		750°F (399°C)			
												G	H	lbs.	kN	lbs.	kN	lbs.	kg
¾	(20)	⅝	(15.88)	3⅞	(87.31)	2⅓⅞	(71.44)	2	(50.80)	1⅜	(34.93)	⅜	⅜	950	(4.23)	850	(3.78)	.83	(.38)
1	(25)	⅝	(15.88)	3½	(88.90)	2⅞	(73.03)	2	(50.80)	1⅜	(34.93)	⅜	⅜	950	(4.23)	850	(3.78)	1.02	(.46)
1¼	(32)	⅝	(15.88)	3⅞	(90.49)	2⅓⅞	(74.61)	2½	(52.39)	1⅞	(36.51)	⅜	⅜	950	(4.23)	850	(3.78)	1.07	(.49)
1½	(40)	1	(25.40)	5¼	(133.35)	4⅝	(117.48)	2⅝	(66.68)	2	(50.80)	⅝	½	1545	(6.87)	1380	(6.14)	2.30	(1.04)
2	(50)	1	(25.40)	5⅜	(136.53)	4¾	(120.65)	2¾	(69.85)	2⅞	(53.98)	⅝	½	1545	(6.87)	1380	(6.14)	2.60	(1.18)
2½	(65)	1	(25.40)	5⅓⅞	(144.46)	5⅓⅞	(128.59)	3⅓⅞	(77.79)	2⅞	(61.91)	⅝	½	1545	(6.87)	1380	(6.14)	2.71	(1.23)
3	(80)	1	(25.40)	6	(152.40)	5⅜	(136.53)	3⅜	(85.73)	2¾	(69.85)	⅝	½	1545	(6.87)	1380	(6.14)	3.03	(1.37)
3½	(90)	1	(25.40)	6⅝	(160.34)	5⅓⅞	(144.46)	3⅓⅞	(93.66)	3⅓⅞	(77.79)	⅝	½	1545	(6.87)	1380	(6.14)	3.28	(1.49)
4	(100)	1	(25.40)	8⅓⅞	(204.79)	7⅓⅞	(179.39)	5⅓⅞	(128.59)	4⅓⅞	(103.19)	¾	⅝	2500	(11.12)	2230	(9.92)	6.67	(3.03)
5	(125)	1	(25.40)	8⅝	(219.08)	7⅝	(193.68)	5⅝	(142.88)	4⅝	(117.48)	¾	⅝	2500	(11.12)	2230	(9.92)	7.05	(3.20)
6	(150)	1½	(38.10)	9⅞	(250.83)	8⅝	(219.08)	6⅜	(161.93)	5⅞	(130.18)	⅞	¾	2865	(12.74)	2555	(11.37)	11.45	(5.19)
8	(200)	1½	(38.10)	11⅞	(282.58)	9⅞	(250.83)	7⅝	(193.68)	6⅜	(161.93)	⅞	¾	2865	(12.74)	2555	(11.37)	13.15	(5.96)
10	(250)	1½	(38.10)	12⅜	(314.33)	11⅞	(282.58)	8⅞	(225.43)	7⅝	(193.68)	1	⅞	3240	(14.41)	2890	(12.86)	19.80	(8.98)
12	(300)	1½	(38.10)	13¾	(349.25)	12½	(317.50)	10¼	(260.35)	9	(228.60)	1	⅞	3240	(14.41)	2890	(12.86)	22.25	(10.09)
14	(350)	1½	(38.10)	15⅓⅞	(382.59)	13⅞	(344.49)	11⅞	(290.51)	9⅓⅞	(252.41)	1¼	⅞	4300	(19.13)	3835	(17.06)	37.68	(17.09)
16	(400)	1½	(38.10)	15⅓⅞	(401.64)	14⅝	(363.54)	12⅓⅞	(309.56)	10⅓⅞	(271.46)	1¼	⅞	4300	(19.13)	3835	(17.06)	41.40	(18.78)
18	(450)	1½	(38.10)	16⅓⅞	(423.86)	15⅞	(392.11)	13⅝	(338.14)	11⅓⅞	(300.04)	1¼	1	4300	(19.13)	3835	(17.06)	44.87	(20.35)
20	(500)	2	(50.80)	18	(457.20)	16½	(419.10)	14½	(368.30)	13	(330.20)	1⅜	1⅞	4500	(20.02)	4015	(17.86)	57.25	(25.97)
24	(600)	2	(50.80)	20¼	(514.35)	18¾	(476.25)	16¾	(425.45)	15¼	(387.35)	1⅜	1¼	5490	(24.42)	4900	(21.80)	65.90	(29.89)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

PIPE CLAMPS

FIG. 526

HEAVY DUTY DOUBLE BOLT PIPE CLAMP



Function: Designed for the suspension of high temperature pipe lines. The increased material and bolt sizes allow Fig. 526 to be used in applications where heavier loads will be encountered. Normally used in conjunction with Fig. 35 weldless eye nut or Fig. 55 welded eye rod to allow flexibility at the rod attachment. The clamp can be used with up to 4 inches (101.6) of insulation and temperatures up to 750° F (399° C).

Material: Carbon steel (Type 304 or 316 Stainless Steel upon request)
Finish: Plain or electro-galvanized (Hot dipped galvanized with electro-galvanized hardware upon request)

Approvals: Complies with Federal Specification A-A-1192A (Type 3) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 3) which supersedes ANSI/MSS SP-69.

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

Pipe Size		B		C		D		E		F		Bolt Size		Max. Rec. Load				Wt. Each	
														650°F (343°C)		750°F (399°C)			
												G	H	lbs.	kN	lbs.	kN	lbs.	kg
6	(150)	1¾	(44.45)	10 ¹³ /16	(274.64)	8 ¹⁵ /16	(227.01)	6	(152.40)	5¾	(146.05)	1	1	3500	(15.57)	3125	(13.90)	14.14	(6.41)
8	(200)	2	(50.80)	11¾	(288.93)	10¼	(257.18)	7¼	(184.15)	6	(152.40)	1½	1	4800	(21.35)	4285	(19.06)	20.99	(9.52)
10	(250)	2¼	(57.15)	13¾	(333.38)	11¾	(288.93)	9	(228.60)	7¼	(184.15)	1¼	1¼	5500	(24.47)	4910	(21.84)	33.71	(15.29)
12	(300)	2½	(63.50)	14 ⁵ /16	(363.54)	12 ⁹ /16	(319.09)	10¾	(263.53)	8 ⁵ /8	(219.08)	1½	1½	7000	(31.14)	6250	(27.80)	48.17	(21.85)
14	(350)	2½	(63.50)	16	(406.40)	14	(355.60)	11 ⁵ /8	(295.28)	9 ⁵ /8	(244.48)	1½	1½	9500	(42.26)	8485	(37.74)	70.50	(31.98)
16	(400)	3	(76.20)	18	(457.20)	15¾	(400.05)	13¾	(333.38)	10 ⁷ /8	(276.23)	1¾	1½	10000	(44.48)	8930	(39.72)	93.90	(42.59)
18	(450)	3½	(88.90)	19½	(495.30)	17½	(444.50)	14½	(368.30)	12½	(317.50)	2	2	13800	(61.39)	12325	(54.82)	123.72	(56.12)
20	(500)	3½	(88.90)	21¾	(552.45)	19¼	(488.95)	16	(406.40)	13½	(342.90)	2	2	15300	(68.06)	13665	(60.78)	156.43	(70.96)
24	(600)	3½	(88.90)	24 ¹³ /16	(630.24)	21 ¹³ /16	(554.04)	18½	(469.90)	15½	(393.70)	2	2	16300	(72.51)	14555	(64.74)	204.65	(92.83)
28	(700)	4	(101.60)	31¾	(806.45)	27¼	(692.15)	23¾	(593.73)	18 ⁷ /8	(479.43)	2¼	2¼	18000	(80.07)	16065	(71.46)	354.00	(160.57)
30	(750)	4¼	(107.95)	32¾	(831.85)	28¼	(717.55)	24¾	(619.13)	19 ⁷ /8	(504.83)	2¼	2¼	20500	(91.19)	18300	(81.40)	406.00	(184.16)
32	(800)	4¼	(107.95)	36	(914.40)	31	(787.40)	26¾	(679.45)	21¾	(552.45)	2½	2½	23750	(105.65)	-	-	555.00	(251.74)
34	(850)	4¼	(107.95)	37½	(952.50)	32½	(825.50)	28¾	(720.73)	23¾	(593.73)	2½	2½	25000	(111.21)	-	-	604.00	(273.97)
36	(900)	4½	(114.30)	40¼	(1022.35)	34¾	(882.65)	30¾	(765.18)	24 ⁵ /8	(625.48)	2¾	2¾	28000	(124.55)	-	-	678.00	(307.54)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

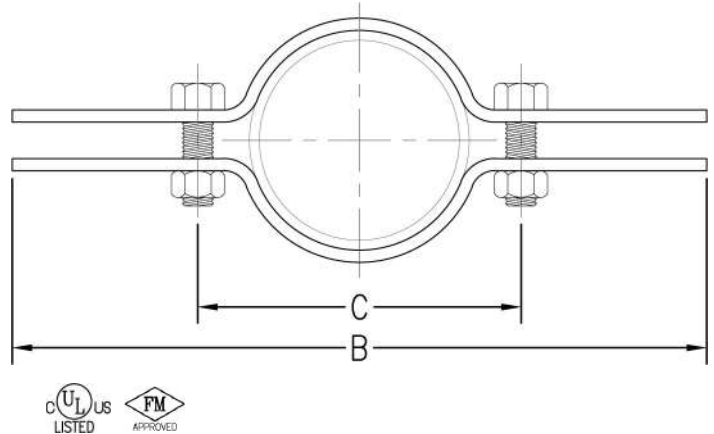
PIPE CLAMPS



RISER CLAMP

FIG. 550, 551, & 553

- Function:** Designed for supporting and stabilizing vertical pipe runs. The PVC coating on Fig. 553 protects the pipe from the metal surface of the clamp. This product is not intended for use with hanger rods. Clamp is designed for standard iron pipe O.D. and must be considered when sizing other types of piping.
- Material:** Carbon steel (Type 304 or 316 Stainless Steel upon request)
- Finish:** Plain (**Fig. 550**), electro-galvanized (**Fig. 551**), or plain with PVC coating (**Fig. 553**), or (Hot dipped galvanized with electro-galvanized hardware upon request)
- Approvals:** Underwriters' Laboratories Listed in the U.S. (UL) and Canada (CUL), and Factory Mutual Approved for sizes $\frac{3}{4}$ " (20mm) to 8" (200mm) only. Fig. 553 is not UL or FM approved. Complies with Federal Specification A-A-1192A (Type 8) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 8) which supersedes ANSI/MSS SP-69.
- Ordering:** Specify figure number, pipe size, material, and finish.



Installation practice for Model 550 Riser Clamps:
When possible the clamp should be placed under a coupling, hub, or welded lugs on steel pipe. Bolt torques should be per industry standards.

Pipe Size		B		C		Bolt Size	Max. Rec. Load		Wt. Each	
							lbs.	kN	lbs.	kg
$\frac{1}{2}$	(15)	9	(228.60)	$2\frac{1}{2}$	(63.50)	$\frac{3}{8} \times 1\frac{1}{4}$	220	(0.98)	1.05	(.48)
$\frac{3}{4}$	(20)	$8\frac{7}{8}$	(225.43)	$2\frac{3}{8}$	(60.33)	$\frac{3}{8} \times 1\frac{1}{4}$	220	(0.98)	1.05	(.48)
1	(25)	$8\frac{3}{4}$	(222.25)	$2\frac{1}{4}$	(57.15)	$\frac{3}{8} \times 1\frac{1}{4}$	220	(0.98)	1.05	(.48)
$1\frac{1}{4}$	(32)	$9\frac{1}{4}$	(234.95)	$2\frac{3}{4}$	(69.85)	$\frac{3}{8} \times 1\frac{1}{4}$	250	(1.11)	1.10	(.50)
$1\frac{1}{2}$	(40)	10	(254.00)	$3\frac{1}{2}$	(88.90)	$\frac{3}{8} \times 1\frac{1}{4}$	250	(1.11)	1.17	(.53)
2	(50)	$10\frac{1}{4}$	(260.35)	$3\frac{3}{4}$	(95.25)	$\frac{3}{8} \times 1\frac{1}{4}$	300	(1.33)	1.20	(.54)
$2\frac{1}{2}$	(65)	$11\frac{1}{8}$	(282.58)	$4\frac{5}{8}$	(117.48)	$\frac{3}{8} \times 1\frac{1}{2}$	400	(1.78)	1.89	(.86)
3	(80)	$11\frac{3}{4}$	(298.45)	$5\frac{1}{4}$	(133.35)	$\frac{3}{8} \times 1\frac{1}{2}$	500	(2.22)	1.99	(.90)
$3\frac{1}{2}$	(90)	$12\frac{1}{2}$	(317.50)	6	(152.40)	$\frac{3}{8} \times 1\frac{1}{2}$	600	(2.67)	2.17	(.98)
4	(100)	13	(330.20)	$6\frac{1}{2}$	(165.10)	$\frac{1}{2} \times 1\frac{3}{4}$	750	(3.34)	2.21	(1.00)
5	(125)	$14\frac{1}{4}$	(361.95)	$7\frac{3}{4}$	(196.85)	$\frac{1}{2} \times 1\frac{3}{4}$	1500	(6.67)	3.24	(1.47)
6	(150)	$15\frac{3}{8}$	(390.53)	$8\frac{7}{8}$	(225.43)	$\frac{1}{2} \times 1\frac{3}{4}$	1600	(7.12)	3.89	(1.76)
8	(200)	$18\frac{1}{2}$	(469.90)	12	(304.80)	$\frac{5}{8} \times 2$	2500	(11.12)	7.60	(3.45)
10	(250)	$20\frac{1}{2}$	(520.70)	14	(355.60)	$\frac{5}{8} \times 2$	2500	(11.12)	11.10	(5.03)
12	(300)	$22\frac{1}{2}$	(571.50)	16	(406.40)	$\frac{5}{8} \times 2\frac{1}{2}$	2700	(12.01)	16.50	(7.48)
14	(350)	$25\frac{1}{8}$	(638.18)	$18\frac{5}{8}$	(473.08)	$\frac{5}{8} \times 3$	2700	(12.01)	17.70	(8.03)
16	(400)	$26\frac{1}{4}$	(666.75)	$20\frac{3}{4}$	(527.05)	$\frac{3}{4} \times 3\frac{1}{2}$	2900	(12.90)	30.40	(13.79)
18	(450)	$27\frac{7}{8}$	(708.03)	$22\frac{3}{8}$	(568.33)	$\frac{3}{4} \times 3\frac{1}{2}$	2900	(12.90)	33.30	(15.10)
20	(500)	30	(762.00)	$24\frac{1}{2}$	(622.30)	$\frac{3}{4} \times 3\frac{1}{2}$	2900	(12.90)	36.30	(16.47)
24	(600)	35	(889.00)	$29\frac{1}{2}$	(749.30)	$\frac{7}{8} \times 3\frac{1}{2}$	2900	(12.90)	48.68	(22.08)
30	(750)	$42\frac{3}{8}$	(1076.33)	$35\frac{3}{8}$	(898.52)	$\frac{7}{8} \times 3\frac{1}{2}$	2900	(12.90)	60.16	(27.29)

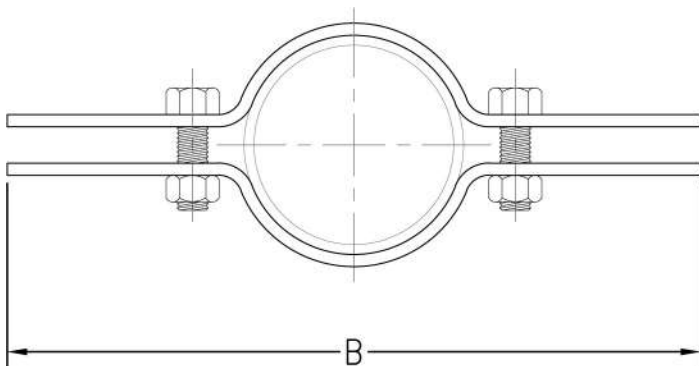
Recommended Torque For Pipe Clamp Hardware						
Bolt Size	1/4"-20	5/16"-18	3/8"-16	1/2"-13	5/8"-11	3/4"-10 & Larger
ft-lbs.	6	11	19	50	65	75
N-m	(8)	(15)	(26)	(68)	(88)	(102)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

PIPE CLAMPS

FIG. 552 & 554

COPPER TUBING RISER CLAMP



Function: Designed for supporting and stabilizing vertical tubing runs. The PVC coating on Fig. 554 protects the tube from the metal surface of the clamp.

Material: Carbon steel

Finish: Copper color epoxy (**Fig. 552**), or Copper color epoxy with PVC coating (**Fig. 554**)

Approvals: Complies with Federal Specification A-A-1192A (Type 8) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 8) which supersedes ANSI/MSS SP-69.

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

Installation practice for Model 550 Riser Clamps:

When possible the clamp should be placed under a coupling, hub, or welded lugs on steel pipe. Bolt torques should be per industry standards.

Pipe Size		B		Bolt Size	Max. Rec. Load		Wt. Each	
					lbs.	kN	lbs.	kg
1/2	(15)	6 11/16	(169.86)	1/4	75	(.33)	.50	(.23)
3/4	(20)	7	(177.80)	1/4	75	(.33)	.52	(.24)
1	(25)	8 3/4	(222.25)	1/4	120	(.53)	.64	(.29)
1 1/4	(32)	9	(228.60)	1/4	150	(.67)	.65	(.29)
1 1/2	(40)	9 3/8	(238.13)	1/4	150	(.67)	.70	(.32)
2	(50)	9 15/16	(252.41)	3/8	150	(.67)	.98	(.44)
2 1/2	(65)	10 1/2	(266.70)	3/8	300	(1.33)	1.09	(.49)
3	(80)	11	(279.40)	3/8	300	(1.33)	1.17	(.53)
3 1/2	(90)	12 3/16	(309.56)	3/8	300	(1.33)	1.53	(.69)
4	(100)	12 5/8	(320.68)	3/8	300	(1.33)	1.67	(.76)
5	(125)	14 1/8	(358.78)	1/2	500	(2.22)	2.42	(1.10)
6	(150)	15	(381.00)	1/2	500	(2.22)	2.68	(1.22)

Recommended Torque For Pipe Clamp Hardware

Bolt Size	1/4"-20	5/16"-18	3/8"-16	1/2"-13	5/8"-11	3/4"-10 & Larger
ft-lbs.	6	11	19	50	65	75
N-m	(8)	(15)	(26)	(68)	(88)	(102)

PIPE CLAMPS



INSULATION RISER CLAMP

FIG. R087100 - R412150

- Function:** The patented Titan riser is made to fit insulated pipe and create a clean vapor barrier on vertical pipe runs. Klo-Shure Titan riser will dramatically improve the fit and finish of insulated tube and pipe runs.
- Material:** Carbon steel clamp. Cushion material is Washington Penn TPO in accordance with ASTM D 4000, TEO0120, A45000
- Finish:** Electro-galvanized
- Ordering:** Specify figure number.

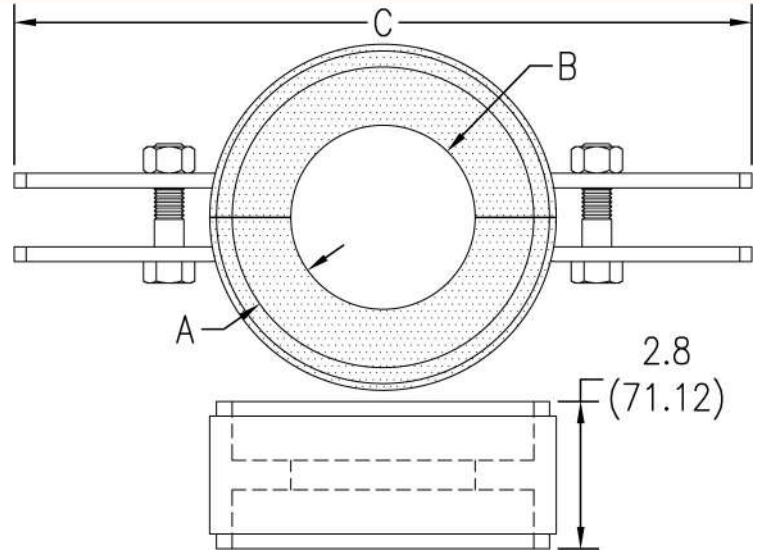


Fig. Number	Insulation Thickness A		B		C		Max. Rec. Load		Wt. Each	
							lbs.	kN	lbs.	kg
R087100	1	(25.4)	7/8	(22.23)	10.125	(257.18)	75	(0.33)	2.375	(1.08)
R112100	1	(25.4)	1 1/8	(28.58)	10.875	(276.23)	120	(0.53)	2.555	(1.16)
R137100	1	(25.4)	1 3/8	(34.93)	11.5	(292.10)	150	(0.67)	2.885	(1.31)
R162100	1	(25.4)	1 5/8	(41.28)	11.5	(292.10)	150	(0.67)	2.865	(1.30)
R212100	1	(25.4)	2 1/8	(53.98)	11.5	(292.10)	190	(0.85)	3.515	(1.59)
R262100	1	(25.4)	2 5/8	(66.68)	12.5	(317.50)	300	(1.33)	3.855	(1.75)
R312100	1	(25.4)	3 1/8	(79.38)	12.5	(317.50)	300	(1.33)	4.215	(1.91)
R412100	1	(25.4)	4 1/8	(104.78)	13.8	(350.52)	320	(1.42)	5.475	(2.48)
R087150	1 1/2	(38.1)	7/8	(22.23)	10.875	(276.23)	75	(0.33)	2.905	(1.32)
R112150	1 1/2	(38.1)	1 1/8	(28.58)	10.875	(276.23)	120	(0.53)	3.045	(1.38)
R137150	1 1/2	(38.1)	1 3/8	(34.93)	11.5	(292.10)	150	(0.67)	3.355	(1.52)
R162150	1 1/2	(38.1)	1 5/8	(41.28)	11.5	(292.10)	150	(0.67)	3.625	(1.64)
R212150	1 1/2	(38.1)	2 1/8	(53.98)	12	(304.80)	150	(0.67)	4.245	(1.93)
R262150	1 1/2	(38.1)	2 5/8	(66.68)	12	(304.80)	300	(1.33)	3.855	(1.75)
R312150	1 1/2	(38.1)	3 1/8	(79.38)	13	(330.20)	300	(1.33)	5.785	(2.62)
R412150	1 1/2	(38.1)	4 1/8	(104.78)	15.625	(396.88)	300	(1.33)	6.915	(3.14)

Load data based on 200 in-lb. torque

PIPE CLAMPS

FIG. 580

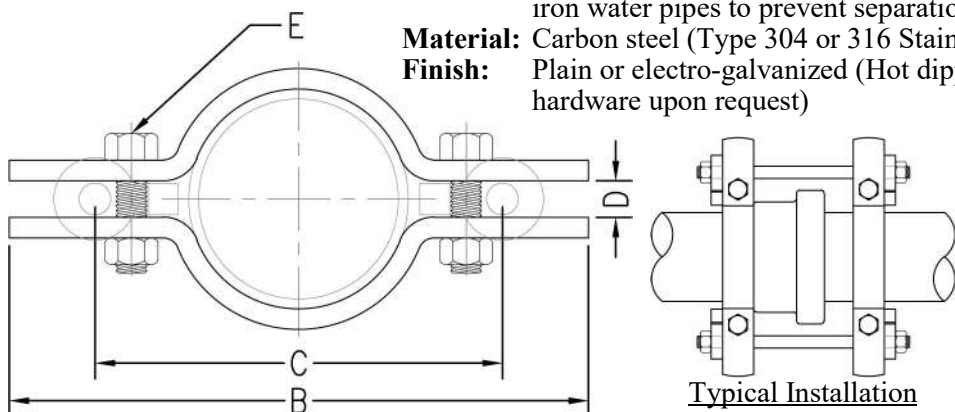
TWO BOLT UNDERGROUND PIPE CLAMP

Function: Designed for clamping the caulked joints of underground A.W.W.A. ductile iron water pipes to prevent separation of joints.

Material: Carbon steel (Type 304 or 316 Stainless Steel upon request)

Finish: Plain or electro-galvanized (Hot dipped galvanized with electro-galvanized hardware upon request)

Ordering: Specify figure number, pipe size, material, and finish.
Order Fig. 585 washer separately.

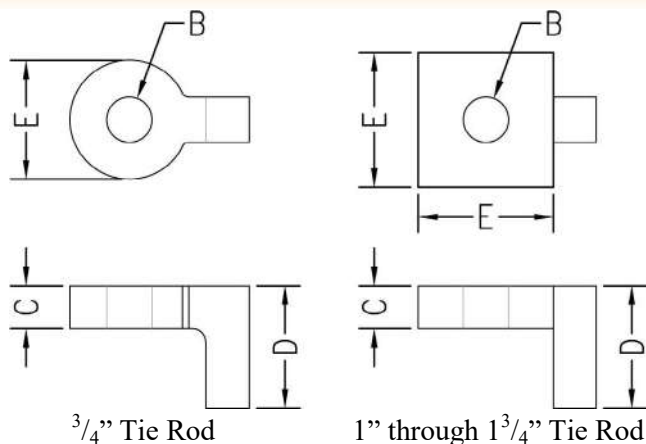


NOTE: Clamps must be connected by means of threaded tie rods and the nuts drawn tight on the washers to assure a tight joint.

Pipe Size	Max. Pipe O.D.	B		C		D		Bolt Size E	Rec. Tie Rod Size	Wt. Each	
										lbs.	kg
3 (80)	3.96 (100.58)	11 ³ / ₄	(298.45)	9	(228.60)	1 ¹ / ₄	(31.75)	5/8 x 3	3/4	6.18	(2.80)
4 (100)	4.80 (121.92)	13	(330.20)	10 ¹ / ₄	(260.35)	1 ¹ / ₄	(31.75)	5/8 x 3	3/4	8.80	(3.99)
6 (150)	6.90 (175.26)	14 ⁷ / ₈	(377.83)	12	(304.80)	1 ¹ / ₄	(31.75)	5/8 x 3	3/4	10.50	(4.76)
8 (200)	9.05 (229.87)	17 ¹ / ₄	(438.15)	14 ¹ / ₂	(368.30)	1 ¹ / ₄	(31.75)	5/8 x 3	3/4	12.34	(5.60)
10 (250)	11.10 (281.94)	19 ¹ / ₂	(495.30)	16 ³ / ₄	(425.45)	1 ¹ / ₄	(31.75)	5/8 x 3	3/4	14.80	(6.71)
12 (300)	13.20 (335.28)	21 ³ / ₄	(552.45)	19	(482.60)	1 ¹ / ₄	(31.75)	5/8 x 3 ¹ / ₂	3/4	16.03	(7.27)
14 (350)	15.30 (388.62)	27 ⁷ / ₈	(708.03)	23 ³ / ₈	(593.73)	1 ³ / ₈	(34.93)	7/8 x 4	1	44.37	(20.13)
16 (400)	17.40 (441.96)	29 ¹ / ₈	(739.77)	25 ¹ / ₂	(647.70)	1 ¹ / ₂	(38.10)	1 x 4 ¹ / ₂	1 ¹ / ₈	64.74	(29.37)
18 (450)	19.50 (495.30)	32 ¹ / ₄	(819.15)	28	(711.20)	1 ¹ / ₂	(38.10)	1 ¹ / ₄ x 4 ¹ / ₂	1 ¹ / ₄	73.69	(33.43)
20 (500)	21.60 (548.64)	33 ¹ / ₄	(844.55)	29 ³ / ₄	(755.65)	1 ⁵ / ₈	(41.28)	1 ¹ / ₄ x 4 ¹ / ₂	1 ³ / ₈	86.00	(39.01)
24 (600)	25.80 (655.32)	37 ³ / ₄	(958.85)	34	(863.60)	1 ³ / ₄	(44.45)	1 ¹ / ₂ x 5	1 ¹ / ₂	113.00	(51.26)
30 (750)	32.00 (812.80)	45 ¹ / ₈	(1146.18)	41 ³ / ₈	(1050.93)	2	(50.80)	1 ¹ / ₂ x 5 ¹ / ₂	1 ³ / ₄	136.78	(62.04)
36 (900)	38.30 (972.82)	50 ³ / ₄	(1289.05)	46 ¹ / ₂	(1181.10)	2 ¹ / ₂	(63.50)	1 ¹ / ₂ x 5 ¹ / ₂	1 ³ / ₄	155.50	(70.53)

FIG. 585

WASHER (For Fig. 580)



Function: Designed to secure tie rods when used in conjunction with Fig. 580 two bolt underground pipe clamp.

Material: Carbon steel (Type 304 or 316 Stainless Steel upon request). 3/4" tie rod size is only available in cast iron.

Finish: Plain or electro-galvanized (Hot dipped galvanized upon request)

Ordering: Specify figure number, tie rod size, material, and finish.

Tie Rod Size	Dia. B		C		D		E		For Pipe Sizes		Wt. Each	
											lbs.	kg
3/4	7/8	(22.23)	5/8	(15.88)	1 ³ / ₄	(44.45)	2 ⁵ / ₁₆	(58.74)	3 - 12	(80 - 300)	.80	(.36)
1	1 ¹ / ₈	(28.58)	1/2	(12.70)	3	(76.20)	3 ¹ / ₂	(88.90)	14	(350)	1.45	(.66)
1 ¹ / ₈	1 ¹ / ₄	(31.75)	5/8	(15.88)	3	(76.20)	4	(101.60)	16	(400)	2.31	(1.05)
1 ¹ / ₄	1 ³ / ₈	(34.93)	5/8	(15.88)	3	(76.20)	4	(101.60)	18	(450)	2.26	(1.03)
1 ³ / ₈	1 ¹ / ₂	(38.10)	3/4	(19.05)	3	(76.20)	4	(101.60)	20	(500)	2.87	(1.30)
1 ¹ / ₂	1 ⁵ / ₈	(41.28)	3/4	(19.05)	3	(76.20)	4	(101.60)	24	(600)	2.71	(1.23)
1 ³ / ₄	1 ⁷ / ₈	(47.63)	1	(25.40)	3	(76.20)	4	(101.60)	30 - 36	(750 - 900)	4.17	(1.89)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

PIPE CLAMPS

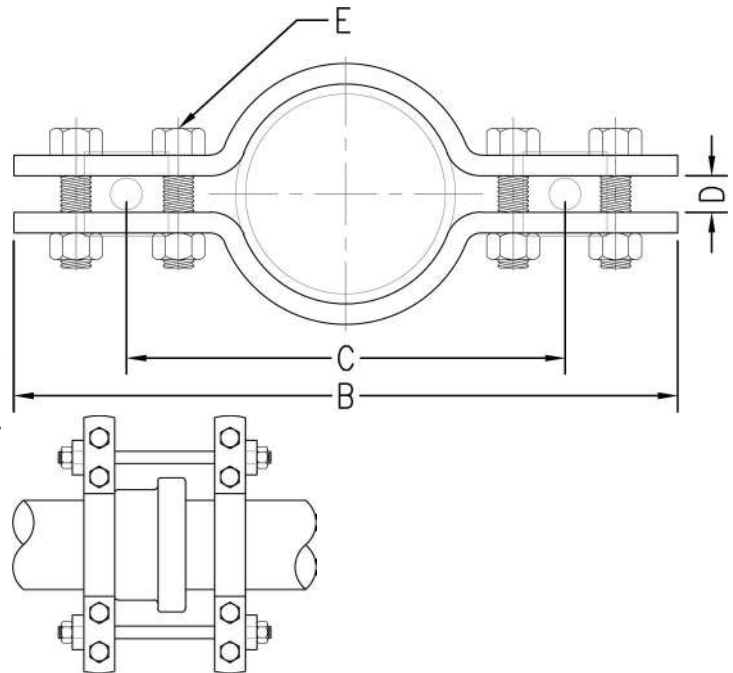


FOUR BOLT UNDERGROUND PIPE CLAMP

FIG. 590

- Function:** Designed for clamping the caulked joints of underground A.W.W.A. ductile iron water pipe lines to prevent separation of joints.
- Material:** Carbon steel (Type 304 or 316 Stainless Steel upon request)
- Finish:** Plain or electro-galvanized (Hot dipped galvanized with electro-galvanized hardware upon request)
- Approvals:** Complies with National Fire Protection Association Standard 24 for 4" (100) thru 12" (300) pipe.
- Ordering:** Specify figure number, pipe size, material, and finish. Order Fig. 595 washer separately.

NOTE: Clamps must be connected by means of threaded tie rods and the nuts drawn tight on the washers to assure a tight joint.



Typical Installation

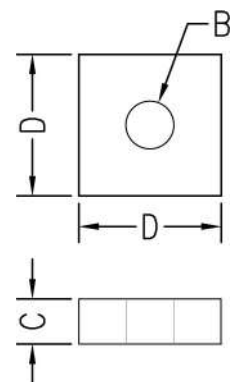
Pipe Size	Max. Pipe O.D.	B		C		D		Bolt Size E	Rec. Tie Rod Size	Max. Test Pressure		Force on Clamp		Wt. Each	
										PSI	kPa	lbs.	kN	lbs.	kg
4 (100)	4.80 (121.92)	14 ⁵ / ₈	(371.48)	9 ⁵ / ₈	(244.48)	1 ¹ / ₄	(31.75)	5/8 x 3	3/4	250	(1722.5)	4550	(20.24)	12.8	(5.81)
6 (150)	6.90 (175.26)	16 ⁷ / ₈	(428.63)	11 ⁷ / ₈	(301.63)	1 ¹ / ₄	(31.75)	5/8 x 3	3/4	250	(1722.5)	9340	(41.55)	14.6	(6.62)
8 (200)	9.05 (229.87)	19 ¹ / ₈	(485.78)	14 ¹ / ₈	(358.78)	1 ¹ / ₄	(31.75)	5/8 x 3 1/2	3/4	250	(1722.5)	16080	(71.53)	23.6	(10.70)
10 (250)	11.10 (281.94)	21 ³ / ₈	(542.93)	16 ⁵ / ₈	(422.28)	1 ¹ / ₄	(31.75)	3/4 x 3 1/2	1	250	(1722.5)	24180	(107.56)	29.3	(13.29)
12 (300)	13.20 (335.28)	25 ¹ / ₈	(638.18)	19 ⁵ / ₈	(498.48)	1 ¹ / ₄	(31.75)	7/8 x 4	1	250	(1722.5)	34230	(152.26)	40.3	(18.28)
14 (350)	15.30 (388.62)	28 ³ / ₄	(717.55)	22 ³ / ₈	(568.33)	1 ³ / ₄	(44.45)	7/8 x 4 1/2	1 1/4	120	(826.8)	22200	(98.75)	53.9	(24.45)
16 (400)	17.40 (441.96)	31 ³ / ₈	(796.93)	25 ³ / ₈	(644.53)	1 ³ / ₄	(44.45)	1 x 4 1/2	1 1/4	115	(792.3)	27760	(123.48)	76.5	(34.70)
18 (450)	19.50 (495.30)	35 ¹ / ₈	(892.18)	28 ¹ / ₈	(714.38)	1 ³ / ₄	(44.45)	1 1/4 x 4 1/2	1 1/4	100	(689.0)	23900	(106.31)	94.3	(42.77)
20 (500)	21.60 (548.64)	37 ³ / ₄	(958.85)	30 ¹ / ₂	(774.70)	1 ³ / ₄	(44.45)	1 1/4 x 4 1/2	1 3/8	75	(516.7)	27500	(122.33)	109.8	(49.80)
24 (600)	25.80 (655.32)	44 ¹ / ₄	(1123.95)	36	(914.40)	1 ³ / ₄	(44.45)	1 1/2 x 5	1 1/2	50	(344.5)	26200	(116.54)	148.6	(67.40)

WASHER (For Fig. 590)

FIG. 595

- Function:** Designed to secure tie rods when used in conjunction with Fig. 590 four bolt underground pipe clamp.
- Material:** Carbon steel (Type 304 or 316 Stainless Steel upon request)
- Finish:** Plain or electro-galvanized (Hot dipped galvanized upon request)
- Ordering:** Specify figure number, tie rod size, material, and finish.

Tie Rod Size	Dia. B	C		D		For Pipe Sizes		Wt. Each	
								lbs.	kg
3/4	7/8	(22.23)	1/2	(12.70)	3	(76.20)	4 - 8 (100 - 200)	1.19	(.54)
1	1 1/8	(28.58)	1/2	(12.70)	3 1/2	(88.90)	10 - 12 (250 - 300)	1.49	(.68)
1 1/4	1 3/8	(34.93)	3/4	(19.05)	3 1/2	(88.90)	14 - 18 (350 - 450)	2.15	(.98)
1 3/8	1 1/2	(38.10)	3/4	(19.05)	3 1/2	(88.90)	20 (500)	1.92	(.87)
1 1/2	1 5/8	(41.28)	3/4	(19.05)	3 1/2	(88.90)	24 (600)	1.85	(.84)

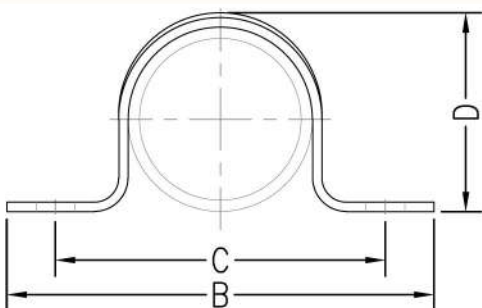


Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

PIPE CLAMPS

FIG. 825 & 826

TWO HOLE STRAP



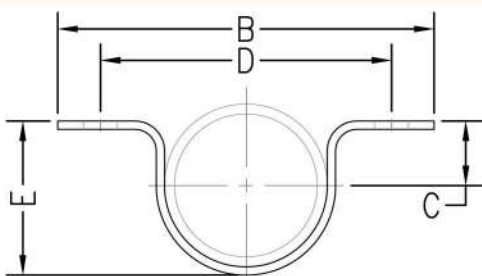
- Function:** Designed to hold pipe/conduit (**Fig. 825**) or copper tubing (**Fig. 826**) flush with mounting surface for light duty applications.
- Material:** Carbon steel
- Finish:** Electro-galvanized (**Fig. 825**) or copper plated (**Fig. 826**)
- Ordering:** Specify figure number and pipe, conduit, or copper tubing size.

Fig. 825									
Pipe Size		B		C		D		Wt. Each	
								lbs.	kg
1/4	(6)	1 5/8	(41.28)	1 1/8	(28.58)	5/8	(15.88)	.01	(.01)
3/8	(10)	2 3/8	(60.33)	1 5/8	(41.28)	1 1/16	(17.46)	.03	(.01)
1/2	(15)	2 5/8	(66.68)	1 7/8	(47.63)	7/8	(22.23)	.04	(.02)
3/4	(20)	2 3/4	(69.85)	2 1/8	(53.98)	1 1/8	(28.58)	.05	(.02)
1	(25)	3 3/8	(85.73)	2 5/8	(66.68)	1 7/16	(36.51)	.06	(.03)
1 1/4	(32)	4 1/4	(107.95)	3 3/16	(80.96)	1 13/16	(46.04)	.08	(.04)
1 1/2	(40)	4 1/2	(114.30)	3 1/2	(88.90)	1 5/16	(49.21)	.10	(.05)
2	(50)	5 3/8	(136.53)	4 1/8	(104.78)	2 9/16	(65.09)	.13	(.06)
2 1/2	(65)	6	(152.40)	4 1/2	(114.30)	3 1/16	(77.79)	.20	(.09)
3	(80)	7 1/4	(184.15)	5 3/4	(146.05)	3 3/4	(95.25)	.50	(.23)
4	(100)	8 3/8	(212.73)	5 3/4	(146.05)	4 11/16	(119.06)	.51	(.23)

Fig. 826									
Tube Size		B		C		D		Wt. Each	
								lbs.	kg
1/4	(6)	1 5/8	(41.28)	1 1/8	(28.58)	3/8	(9.53)	.01	(.01)
3/8	(10)	1 13/16	(46.04)	1 5/16	(33.34)	1/2	(12.70)	.01	(.01)
1/2	(15)	1 5/16	(49.21)	1 7/16	(36.51)	5/8	(15.88)	.01	(.01)
3/4	(20)	2 1/4	(57.15)	1 3/4	(44.45)	7/8	(22.23)	.01	(.01)
1	(25)	2 3/4	(69.85)	2 1/4	(57.15)	1 1/8	(28.58)	.01	(.01)
1 1/4	(32)	2 5/8	(66.68)	2 1/8	(53.98)	1 3/8	(34.93)	.04	(.02)
1 1/2	(40)	2 7/8	(73.03)	2 3/8	(60.33)	1 5/8	(41.28)	.05	(.02)
2	(50)	3 3/8	(85.73)	2 7/8	(73.03)	2 1/8	(53.98)	.05	(.02)

FIG. 830

SHORT PIPE STRAP



- Function:** Designed to hold pipe flush with mounting surface.
- Material:** Carbon steel (Type 304 or 316 Stainless Steel upon request)
- Finish:** Plain or electro-galvanized (Hot dipped galvanized upon request)
- Approvals:** Complies with Federal Specification A-A-1192A (Type 26) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 26) which supersedes ANSI/MSS SP-69.
- Ordering:** Specify figure number, pipe size, material, and finish.

Pipe Size		B		C		D		E		Hole Size		Max. Rec. Load		Wt. Each	
												lbs.	kN	lbs.	kg
1/2	(15)	3 7/8	(98.43)	5 1/16	(7.94)	2 7/8	(73.03)	1 5/16	(23.81)	7/16	(11.11)	300	(1.33)	0.25	(.11)
3/4	(20)	4 1/16	(103.19)	7 1/16	(11.11)	3 1/16	(77.79)	1 1/8	(28.58)	7/16	(11.11)	300	(1.33)	0.27	(.12)
1	(25)	4 5/16	(109.54)	9 1/16	(14.29)	3 5/16	(84.14)	1 3/8	(34.93)	7/16	(11.11)	300	(1.33)	0.29	(.13)
1 1/4	(32)	4 11/16	(119.06)	11 1/16	(17.46)	3 11/16	(93.66)	1 5/8	(41.28)	7/16	(11.11)	300	(1.33)	0.33	(.15)
1 1/2	(40)	4 15/16	(125.41)	13 1/16	(20.64)	3 15/16	(100.01)	2	(50.80)	7/16	(11.11)	300	(1.33)	0.35	(.16)
2	(50)	5 1/2	(139.70)	15 1/16	(23.81)	4 1/2	(114.30)	2 1/4	(57.15)	7/16	(11.11)	300	(1.33)	0.41	(.19)
2 1/2	(65)	6	(152.40)	13 1/16	(30.16)	5	(127.00)	2 7/8	(73.03)	7/16	(11.11)	500	(2.22)	0.89	(.40)
3	(80)	6 5/8	(168.28)	1 1/2	(38.10)	5 5/8	(142.88)	3 1/2	(88.90)	7/16	(11.11)	500	(2.22)	1.06	(.48)
3 1/2	(90)	7 1/8	(180.98)	1 3/4	(44.45)	6 1/8	(155.58)	4	(101.60)	7/16	(11.11)	500	(2.22)	1.23	(.56)
4	(100)	8 3/8	(212.73)	2	(50.80)	7 1/8	(180.98)	4 1/2	(114.30)	9/16	(14.29)	500	(2.22)	1.58	(.72)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

PIPE CLAMPS



ONE HOLE STRAP

- Function:** Designed for the support of standard steel pipe (**Fig. 835**), copper tube (**Fig. 836**), or EMT conduit (**Fig. 837**) on walls or sides of beams. Not recommended for use horizontally, on ceilings, or on bottoms of beams.
- Material:** Carbon steel (Type 304 or 316 Stainless Steel upon request for Fig. 835, & Fig. 837)
- Finish:** Electro-galvanized (**Fig. 835 & Fig. 837**) & copper plated (**Fig. 836**)
- Ordering:** Specify figure number, pipe, tube, or EMT size, material, and finish.

FIG. 835, 836, & 837

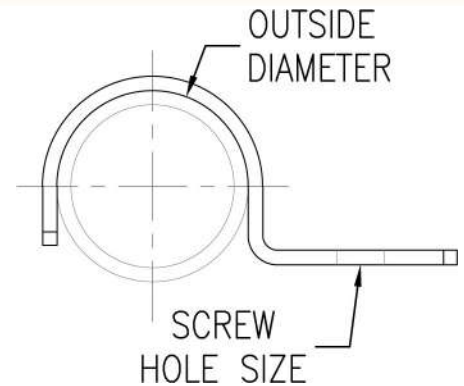


Fig. 835							
Pipe Size		Outside Diameter		Screw Hole Size		Wt. Each	
						lbs.	kg
1/2	(15)	.84	(21.34)	9/32	(7.14)	.06	(.03)
3/4	(20)	1.05	(26.67)	9/32	(7.14)	.10	(.05)
1	(25)	1.32	(33.27)	9/32	(7.14)	.10	(.05)
1 1/4	(32)	1.66	(42.16)	11/32	(8.73)	.13	(.06)
1 1/2	(40)	1.90	(48.26)	13/32	(10.32)	.20	(.09)
2	(50)	2.38	(60.20)	13/32	(10.32)	.25	(.11)
2 1/2	(65)	2.88	(72.90)	9/16	(14.29)	.50	(.23)
3	(80)	3.50	(88.90)	9/16	(14.29)	1.00	(.45)
4	(100)	4.50	(114.30)	9/16	(14.29)	1.50	(.68)

Fig. 836							
Tube Size		Outside Diameter		Screw Hole Size		Wt. Each	
						lbs.	kg
1/8	(3)	.25	(6.35)	3/16	(4.76)	.01	(.01)
1/4	(6)	.38	(9.53)	3/16	(4.76)	.02	(.01)
3/8	(10)	.50	(12.70)	9/32	(7.14)	.02	(.01)
1/2	(15)	.63	(15.88)	9/32	(7.14)	.03	(.01)
3/4	(20)	.88	(22.23)	9/32	(7.14)	.06	(.03)
1	(25)	1.13	(28.58)	9/32	(7.14)	.07	(.03)
1 1/4	(32)	1.38	(34.93)	9/32	(7.14)	.09	(.04)
1 1/2	(40)	1.63	(41.28)	5/16	(7.94)	.13	(.06)
2	(50)	2.13	(53.98)	3/8	(9.53)	.20	(.09)

Fig. 837							
EMT Size		Outside Diameter		Screw Hole Size		Wt. Each	
						lbs.	kg
1/2	(15)	.71	(18.03)	9/32	(7.14)	.06	(.03)
3/4	(20)	.92	(23.37)	9/32	(7.14)	.10	(.05)
1	(25)	1.16	(29.46)	9/32	(7.14)	.10	(.05)
1 1/4	(32)	1.51	(38.35)	1 1/32	(8.73)	.13	(.06)
1 1/2	(40)	1.74	(44.20)	1 3/32	(10.32)	.20	(.09)
2	(50)	2.20	(55.88)	1 3/32	(10.32)	.25	(.11)
2 1/2	(65)	2.88	(72.90)	9/16	(14.29)	.50	(.23)
3	(80)	3.50	(88.90)	9/16	(14.29)	1.00	(.45)
4	(100)	4.50	(114.30)	9/16	(14.29)	1.50	(.68)

Note: Sizes 1/2 - 1 snap on.

RIGHT ANGLE CLAMP

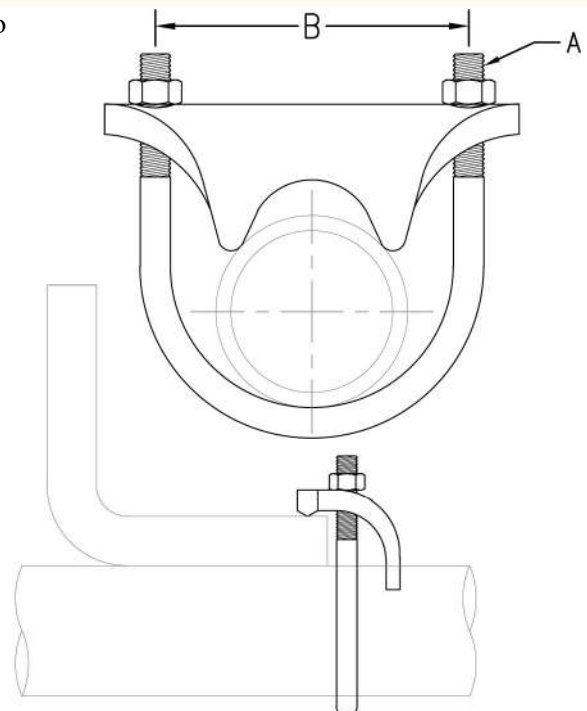
FIG. 840

- Function:** Designed for anchoring pipe or conduit at a right angle to structural members.
- Material:** Malleable iron with carbon steel U-bolt and nuts (Type 316 Stainless Steel upon request)
- Finish:** Hot dipped galvanized
- Ordering:** Specify figure number and pipe size.

NOTE: 5/8" (15.88) maximum flange thickness.

Pipe Size		Rod Size A	B		Wt. Each	
					lbs.	kg
*1/2	(15)	5/16	1 3/16	(30.16)	.41	(.19)
3/4	(20)	5/16	1 3/8	(34.93)	.42	(.19)
1	(25)	5/16	1 5/8	(41.28)	.47	(.21)
1 1/4	(32)	5/16	2 1/16	(52.39)	.54	(.24)
1 1/2	(40)	5/16	2 3/8	(60.33)	.57	(.26)
2	(50)	3/8	2 13/16	(71.44)	.85	(.39)
2 1/2	(65)	3/8	3 7/16	(87.31)	1.06	(.48)
3	(80)	3/8	4 1/16	(103.19)	1.10	(.50)
3 1/2	(90)	3/8	4 9/16	(115.89)	1.28	(.58)
4	(100)	3/8	5 1/16	(128.59)	1.40	(.64)

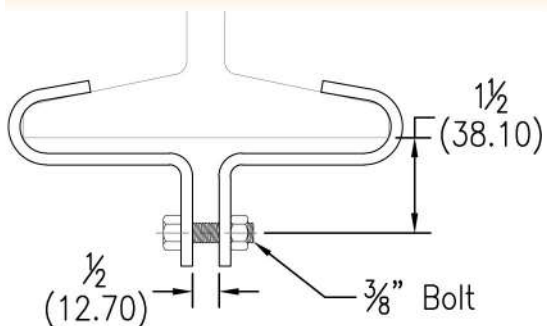
* 3/8" (9.53) maximum flange thickness



CENTER LOAD BEAM CLAMPS

FIG. 610

STANDARD DUTY CENTER LOAD BEAM CLAMP



Function: Designed to be used in the suspension of a hanger rod from the center of an I-beam. The clamp's design allows the load to be distributed equally on either side of the beam. Normally used in conjunction with Fig. 50 eye rod, Fig. 55 welded eye rod, or Fig. 35 weldless eye nut.

Material: Carbon steel (Type 304 or 316 Stainless Steel upon request)
Finish: Plain or electro-galvanized (Hot dipped galvanized with electro-galvanized hardware upon request)

Approvals: Complies with Federal Specification A-A-1192A (Type 21) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 21) which supersedes ANSI/MSS SP-69.

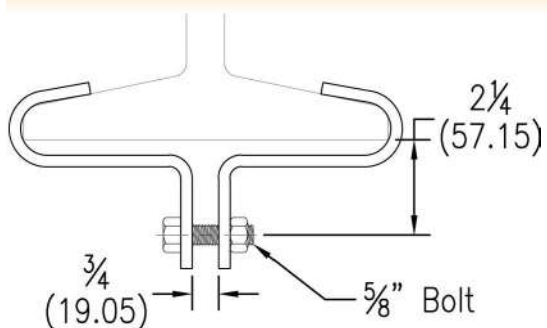
Ordering: Specify figure number, flange width, material, and finish.

NOTE: Spacer is furnished for use with Fig. 35 weldless eye nuts. Spacer may be removed for use with Fig. 50 eye rod or Fig. 55 welded eye rod.

Flange Width		Max. Flange Thickness		Max. Rec. Load		Wt. Each	
				lbs.	kg	lbs.	kg
3	(76.2)	7/16	(11.11)	1000	(4.45)	.85	(.39)
4	(101.6)	1/2	(12.70)	1000	(4.45)	.88	(.40)
5	(127.0)	5/8	(15.88)	1000	(4.45)	1.10	(.50)
6	(152.4)	3/4	(19.05)	1000	(4.45)	1.13	(.51)
7	(177.8)	7/8	(22.23)	1000	(4.45)	1.23	(.56)
8	(203.2)	7/8	(22.23)	1000	(4.45)	1.25	(.57)
9	(228.6)	1	(25.40)	1000	(4.45)	1.43	(.65)
10	(254.0)	1	(25.40)	1000	(4.45)	1.52	(.69)
11	(279.4)	1	(25.40)	1000	(4.45)	1.63	(.74)
12	(304.8)	1 1/4	(31.75)	1000	(4.45)	1.71	(.78)

FIG. 620

HEAVY DUTY CENTER LOAD BEAM CLAMP



Function: Designed to be used in the suspension of a hanger rod from the center of an I-beam. The clamp's design allows the load to be distributed equally on either side of the beam. Normally used in conjunction with Fig. 55 welded eye rod or Fig. 35 weldless eye nut.

Material: Carbon steel (Type 304 or 316 Stainless Steel upon request)
Finish: Plain or electro-galvanized (Hot dipped galvanized with electro-galvanized hardware upon request)

Approvals: Complies with Federal Specification A-A-1192A (Type 21) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 21) which supersedes ANSI/MSS SP-69.

Ordering: Specify figure number, flange width, material, and finish.

NOTE: Spacer is furnished for use with Fig. 35 weldless eye nuts. Spacer may be removed for use with Fig. 50 eye rod or Fig. 55 welded eye rod.

Flange Width		Max. Flange Thickness		Max. Rec. Load		Wt. Each	
				lbs.	kg	lbs.	kg
4	(101.6)	1/2	(12.70)	3000	(13.34)	3.92	(1.78)
5	(127.0)	5/8	(15.88)	3000	(13.34)	4.28	(1.94)
6	(152.4)	3/4	(19.05)	3000	(13.34)	4.45	(2.02)
7	(177.8)	7/8	(22.23)	3000	(13.34)	4.76	(2.16)
8	(203.2)	7/8	(22.23)	3000	(13.34)	5.25	(2.38)
9	(228.6)	1	(25.40)	3000	(13.34)	5.73	(2.60)
10	(254.0)	1	(25.40)	3000	(13.34)	5.94	(2.69)
11	(279.4)	1	(25.40)	3000	(13.34)	6.53	(2.96)
12	(304.8)	1 1/4	(31.75)	3000	(13.34)	6.97	(3.16)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

CENTER LOAD BEAM CLAMPS

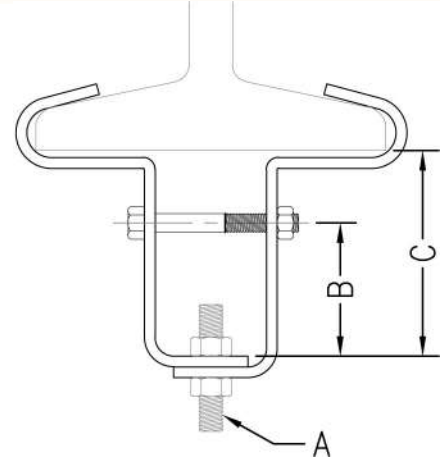


STEEL CENTER LOAD BEAM CLAMP

FIG. 625

- Function:** Designed to be used in the suspension of a hanger rod from the center of an I-beam. The clamp provides a vertical adjustment of approximately 2" (50.8).
- Material:** Carbon steel (Type 304 or 316 Stainless Steel upon request)
- Finish:** Plain or electro-galvanized (Hot dipped galvanized with electro-galvanized hardware upon request)
- Ordering:** Specify figure number, rod size, flange width, material, and finish.

NOTE: Box style furnished on some sizes.

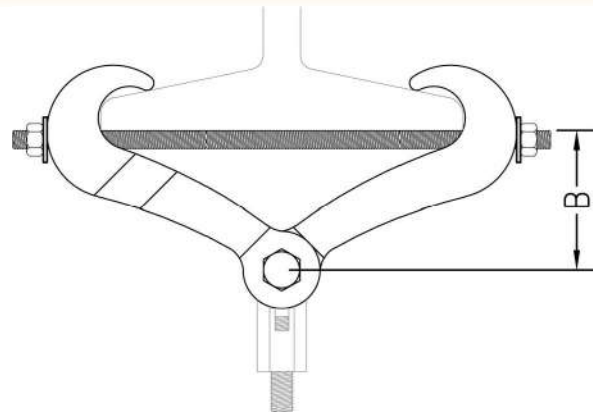


Rod Size A	B		C		Max. Rec. Load		Wt. Each													
							Flange Width													
							4 (101.6)		5 (127.0)		6 (152.4)		7 (177.4)		8 (203.2)		10 (254.2)		12 (304.8)	
					lbs.	kN	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg
3/8	3	(76.20)	4	(101.60)	550	(2.45)	1.68	(.76)	1.81	(.82)	1.93	(.88)	2.05	(.93)	2.14	(.97)	2.35	(1.07)	2.59	(1.17)
1/2	3	(76.20)	4	(101.60)	850	(3.78)	2.01	(.91)	2.17	(.98)	2.31	(1.05)	2.46	(1.12)	2.56	(1.16)	2.82	(1.28)	3.11	(1.41)
5/8	3 1/4	(82.55)	4 1/2	(114.30)	1100	(4.89)	3.28	(1.49)	3.52	(1.60)	3.73	(1.69)	3.95	(1.79)	4.11	(1.86)	4.49	(2.04)	4.93	(2.24)
3/4	3 1/4	(82.55)	4 1/2	(114.30)	1500	(6.67)	4.34	(1.97)	4.66	(2.11)	4.95	(2.25)	5.25	(2.38)	5.46	(2.48)	5.96	(2.70)	6.55	(2.97)
7/8	3 1/2	(88.90)	5	(127.00)	2600	(11.57)	6.57	(2.98)	6.67	(3.03)	7.05	(3.20)	7.44	(3.37)	7.73	(3.51)	8.40	(3.81)	9.18	(4.16)
1	3 1/2	(88.90)	5	(127.00)	4300	(19.13)	7.97	(3.62)	8.24	(3.74)	8.77	(3.98)	9.26	(4.20)	9.62	(4.36)	10.46	(4.74)	11.43	(5.18)
1 1/8	3 1/2	(88.90)	5 1/2	(139.70)	6100	(27.13)	14.46	(6.56)	13.69	(6.21)	13.74	(6.23)	15.07	(6.84)	15.60	(7.08)	16.86	(7.65)	18.32	(8.31)
1 1/4	3 1/2	(88.90)	5 1/2	(139.70)	8000	(35.59)	18.76	(8.51)	18.17	(8.24)	18.45	(8.37)	19.82	(8.99)	20.36	(9.24)	22.21	(10.07)	24.18	(10.97)

MALLEABLE IRON CENTER LOAD BEAM CLAMP

FIG. 630

- Function:** Designed to be used in the suspension of a hanger rod from the center of an I-beam. The clamp's design allows the load to be distributed equally on either side of the beam. The clamp is adjustable from 2 3/8" (60.33) to 7" (177.8) and can be used with flange thicknesses up to .60 inches (15.24). Normally used in conjunction with Fig. 25 extension piece. An additional 1" (25.4) or more of vertical adjustment is obtained when used with Fig 25.
- Material:** Malleable iron
- Finish:** Plain or electro-galvanized
- Approvals:** Complies with Federal Specification A-A-1192A (Type 30) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 30) which supersedes ANSI/MSS SP-69.
- Ordering:** Specify figure number, and finish. If extension piece is required, order Fig. 25 extension piece separately.



Max Rod Size	'B' Rod Take Out (Clamp Only)												Max. Rec. Load		Wt. Each	
	Beam Flange Width															
	2 ³ / ₈ (60.33)			3 (76.2)		4 (101.6)		5 (127.0)		6 (152.4)		7 (177.4)		lbs.	kN	lbs.
7/ ₈	3 ¹ / ₂	(88.90)	3 ⁷ / ₁₆	(87.31)	3 ⁵ / ₁₆	(84.14)	2 ¹⁵ / ₁₆	(74.61)	2 ⁹ / ₁₆	(65.09)	1 ⁷ / ₈	(47.63)	1365	(6.07)	2.49	(1.13)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

CENTER LOAD BEAM CLAMPS

FIG. 632 & 633

STEEL CENTER LOAD BEAM CLAMP

Function: Designed to be used in the suspension of a hanger rod from the center of an I-beam. The clamp's design allows the load to be distributed equally on either side of the beam. The clamp is adjustable and normally used in conjunction with Fig. 35 weldless eye nut. An additional 1" (25.4) or more of vertical adjustment is obtained when used with Fig. 35.

Material: Carbon steel (Type 304 or 316 Stainless Steel upon request)

Finish: Plain or electro-galvanized (Hot dipped galvanized with electro-galvanized hardware upon request)

Approvals: Complies with Federal Specification A-A-1192A (Type 28 without links) (Type 29 with links) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 28 without links) (Type 29 with links) which supersedes ANSI/MSS SP-69.

Ordering: Specify figure number, type size, material, and finish.

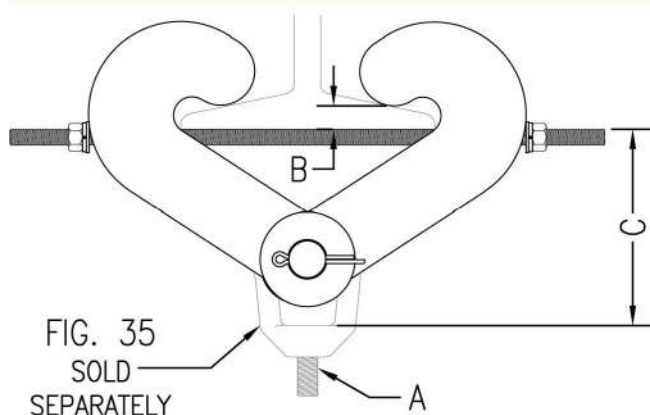


Fig. 632 (without links)

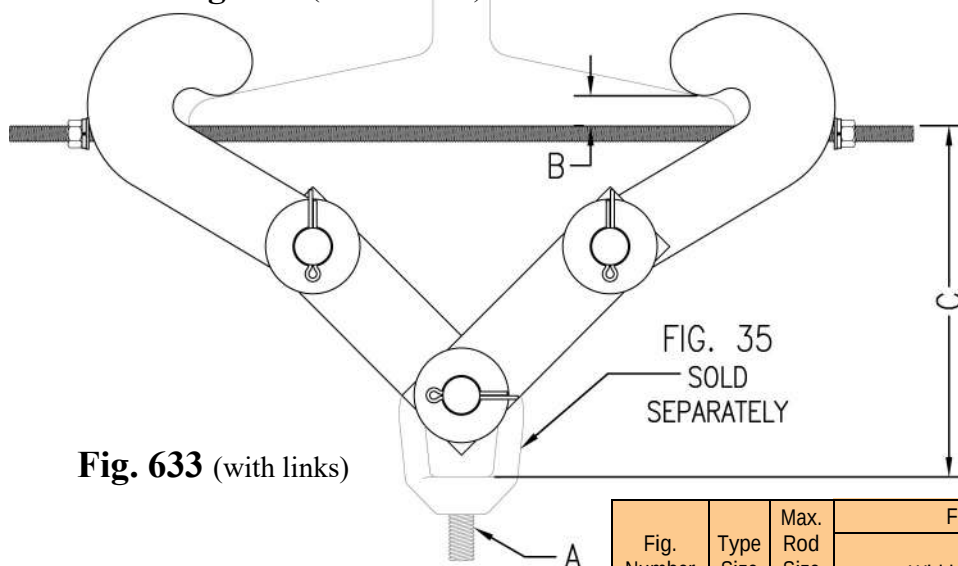


Fig. 633 (with links)

Fig. Number	Type Size	Max. Rod Size A	Flange Size		Max. Rec. Load		Appx. Wt. Each	
			Width	Max. Thickness B	lbs.	kN	lbs.	Kg
632	A	1	3-8 (76.2-203.2)	3/4 (19.05)	5000	(22.24)	9.8	(4.42)
632	B	1 1/2	5-11 (127.0-279.4)	1 (25.40)	11500	(51.15)	25.0	(11.35)
633	A	1	7-15 (177.8-381.0)	3/4 (19.05)	5000	(22.24)	13.5	(6.12)
633	B	1 1/2	8-16 (203.2-406.4)	1 (25.40)	11500	(51.15)	33.1	(15.01)

Based on allowable stresses shown in ANSI Code for Pressure Piping

Fig. Number	Type Size	Rod Take-out for Width of Beam Flange with Max. Rod Size C													
		3 (76.2)		4 (101.6)		5 (127.0)		6 (152.4)		7 (177.8)		8 (203.2)		9 (228.6)	
632	A	5 ³ / ₁₆	(131.76)	5 ¹ / ₈	(130.18)	5	(127.00)	4 ¹³ / ₁₆	(122.24)	4 ³ / ₈	(111.13)	3 ¹⁵ / ₁₆	(100.01)	--	--
632	B	--	--	--	--	7 ¹ / ₂	(190.50)	7	(177.80)	6 ³ / ₄	(171.45)	6 ¹ / ₂	(165.10)	6 ¹ / ₄	(158.75)
633	A	--	--	--	--	--	--	--	--	9 ¹ / ₂	(241.30)	9 ³ / ₈	(238.13)	9 ¹ / ₄	(234.95)
633	B	--	--	--	--	--	--	--	--	--	--	11 ³ / ₄	(298.45)	11 ¹ / ₄	(285.75)

Fig. Number	Type Size	Rod Take-out for Width of Beam Flange with Max. Rod Size C													
		10 (254.0)		11 (279.4)		12 (304.8)		13 (330.2)		14 (355.6)		15 (381.0)		16 (406.4)	
632	A	--	--	--	--	--	--	--	--	--	--	--	--	--	--
632	B	6	(152.40)	5 ⁷ / ₈	(149.23)	--	--	--	--	--	--	--	--	--	--
633	A	9 ¹ / ₈	(231.78)	8 ⁷ / ₈	(225.43)	8 ¹ / ₂	(215.90)	8 ¹ / ₈	(206.38)	7 ³ / ₄	(196.85)	7 ¹ / ₈	(180.98)	--	--
633	B	11	(279.40)	10 ⁷ / ₈	(276.23)	10 ³ / ₄	(273.05)	10 ⁵ / ₈	(269.88)	10 ¹ / ₄	(260.35)	9 ⁷ / ₈	(250.83)	9 ³ / ₈	(238.13)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

CENTER LOAD BEAM CLAMPS

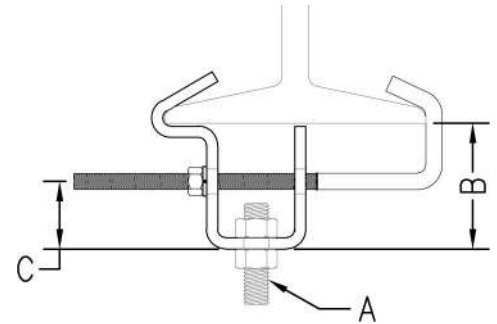


ADJUSTABLE STEEL BEAM CLAMP

FIG. 635

- Function:** Designed to be used in the suspension of a hanger rod from an I-Beam. The clamp is adjustable from 3½" (88.9) to 8" (203.2) and can be used with flange thicknesses up to 1½" (12.7).
- Material:** Carbon steel (Type 304 or 316 Stainless Steel upon request)
- Finish:** Plain or electro-galvanized (Hot dipped galvanized with electro-galvanized hardware upon request)
- Approvals:** Complies with Federal Specification A-A-1192A (Type 27) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 27) which supersedes ANSI/MSS SP-69.
- Ordering:** Specify figure number, rod size, material, and finish.

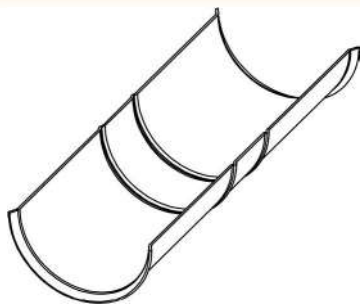
NOTE: For proper installation, tighten hex nut until lock washer is completely flat.



Rod Size A	Flange Width				B		C		Max. Rec. Load		Wt. Each	
	Min.		Max.						lbs.	kN	lbs.	kg
3/8	3 1/2	(88.90)	8	(203.20)	2 3/4	(69.85)	1 1/2	(38.10)	300	(1.33)	1.04	(.47)
1/2	3 1/2	(88.90)	8	(203.20)	2 3/4	(69.85)	1 1/2	(38.10)	700	(3.11)	1.45	(.66)
5/8	3 1/2	(88.90)	8	(203.20)	2 3/4	(69.85)	1 1/2	(38.10)	1000	(4.45)	1.96	(.89)
3/4	6	(152.40)	8	(203.20)	4	(101.60)	2	(50.80)	1800	(8.01)	6.50	(2.95)

FIG. 160

SELF CENTERING INSULATION SHIELD



Function: Designed to provide maximum protection to the insulation. The centering ribs are spaced to center the hanger on the shield, providing equal load distribution. The shield is furnished with flared ends to prevent it from cutting into the insulation.

Material: Carbon steel (Type 304 or 316 Stainless Steel upon request)

Finish: Pre-galvanized

Ordering: Specify figure number, shield number, and material.

NOTE: To determine proper size consult shield selection guide.

Size No.	Shield I.D.		Shield Length		Shield Gauge	Hanger Size		Rib Spacing		Wt. Each	
										lbs.	kg
1	2 ³ / ₈	(60.33)	8	(203.20)	18	2	(50)	1 ¹ / ₄	(31.75)	.35	(.16)
2	2 ⁵ / ₈	(66.68)	8	(203.20)	18	2 ¹ / ₂	(65)	1 ¹ / ₄	(31.75)	.37	(.17)
3	2 ⁷ / ₈	(73.03)	8	(203.20)	18	2 ¹ / ₂	(65)	1 ¹ / ₄	(31.75)	.42	(.19)
4	3 ¹ / ₂	(88.90)	8	(203.20)	18	3	(80)	1 ¹ / ₄	(31.75)	.56	(.25)
5	4	(101.60)	8	(203.20)	18	3 ¹ / ₂	(90)	1 ¹ / ₄	(31.75)	.63	(.29)
6	4 ¹ / ₂	(114.30)	8	(203.20)	18	4	(100)	1 ¹ / ₄	(31.75)	.72	(.33)
7	5	(127.00)	8	(203.20)	18	5	(125)	1 ¹ / ₄	(31.75)	.82	(.37)
8	5 ⁵ / ₈	(142.88)	8	(203.20)	18	5	(125)	1 ¹ / ₄	(31.75)	.92	(.42)
9	6	(152.40)	8	(203.20)	18	6	(150)	2	(50.80)	.98	(.44)
10	6 ⁵ / ₈	(168.28)	8	(203.20)	18	6	(150)	2	(50.80)	1.08	(.49)
11	7 ⁵ / ₈	(193.68)	12	(304.80)	18	8	(200)	2	(50.80)	2.16	(.98)
12	8 ⁵ / ₈	(219.08)	12	(304.80)	18	8	(200)	2	(50.80)	2.43	(1.10)
13	9 ⁵ / ₈	(244.48)	12	(304.80)	18	10	(250)	2	(50.80)	2.73	(1.24)
14	10 ³ / ₄	(273.05)	12	(304.80)	18	10	(250)	2	(50.80)	3.06	(1.39)
15	11 ³ / ₄	(298.45)	12	(304.80)	18	12	(300)	2 ¹ / ₄	(57.15)	3.34	(1.51)
16	12 ³ / ₄	(323.85)	12	(304.80)	18	12	(300)	2 ¹ / ₄	(57.15)	3.60	(1.63)
17	14	(355.60)	12	(304.80)	18	14	(350)	2 ¹ / ₄	(57.15)	3.96	(1.80)
18	15	(381.00)	12	(304.80)	18	16	(400)	2 ³ / ₄	(69.85)	4.23	(1.92)
19	16	(406.40)	12	(304.80)	18	16	(400)	2 ³ / ₄	(69.85)	2.35	(1.07)
20	17	(431.80)	12	(304.80)	18	18	(450)	2 ³ / ₄	(69.85)	2.80	(1.27)
21	18	(457.20)	12	(304.80)	18	18	(450)	2 ³ / ₄	(69.85)	5.08	(2.30)
22	19	(482.60)	12	(304.80)	18	20	(500)	3 ¹ / ₄	(82.55)	5.36	(2.43)
23	20	(508.00)	12	(304.80)	18	20	(500)	3 ¹ / ₄	(82.55)	5.56	(2.52)
24	21	(533.40)	12	(304.80)	18	24	(600)	3 ¹ / ₄	(82.55)	5.90	(2.68)

INSULATION SHIELDS

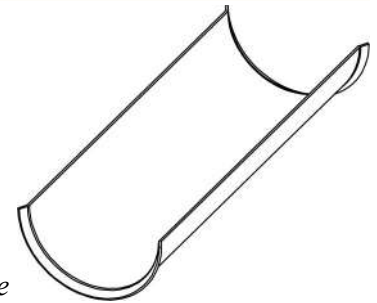


INSULATION PROTECTION SHIELD

FIG. 170

- Function:** Designed for use in the suspension of insulated pipe lines to protect the insulation from being crushed by the hanger.
- Material:** Carbon steel (Type 304 or 316 Stainless Steel upon request)
- Finish:** Pre-galvanized
- Approvals:** Complies with Federal Specifications A-A-1192A (Type 40) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 40) which supersedes ANSI/MSS SP-69.
- Ordering:** Specify figure number, shield number, and material.

NOTE: 12" (304.8mm) length shields furnished with flared ends. To determine proper size consult shield selection guide.



Size No.	Shield I.D.		Shield Length		Shield Gauge	Hanger Size		Wt. Each	
								lbs.	kg
1A	2 ³ / ₈	(60.33)	12	(304.8)	18	2	(50)	.55	(.25)
2A	2 ⁵ / ₈	(66.68)	12	(304.8)	18	2 ¹ / ₂	(65)	.64	(.29)
3A	2 ⁷ / ₈	(73.03)	12	(304.8)	18	2 ¹ / ₂	(65)	.66	(.30)
4A	3 ¹ / ₂	(88.90)	12	(304.8)	18	3	(80)	.89	(.40)
5A	4	(101.60)	12	(304.8)	18	3 ¹ / ₂	(90)	.91	(.41)
6A	4 ¹ / ₂	(114.30)	12	(304.8)	18	4	(100)	1.12	(.51)
7A	5	(127.00)	12	(304.8)	18	5	(125)	1.15	(.52)
8A	5 ⁵ / ₈	(142.88)	12	(304.8)	18	5	(125)	1.35	(.61)
8B	5 ⁵ / ₈	(142.88)	12	(304.8)	16	5	(125)	2.00	(.91)
9A	6	(152.40)	12	(304.8)	18	6	(150)	1.45	(.66)
9B	6	(152.40)	12	(304.8)	16	6	(150)	2.10	(.95)
10A	6 ⁵ / ₈	(168.28)	12	(304.8)	18	6	(150)	1.50	(.68)
10B	6 ⁵ / ₈	(168.28)	12	(304.8)	16	6	(150)	2.37	(1.08)
11A	7 ⁵ / ₈	(193.68)	12	(304.8)	18	8	(200)	2.02	(.92)
11B	7 ⁵ / ₈	(193.68)	12	(304.8)	16	8	(200)	2.50	(1.13)
11C	7 ⁵ / ₈	(193.68)	18	(457.2)	16	8	(200)	3.75	(1.70)
12A	8 ⁵ / ₈	(219.08)	12	(304.8)	18	8	(200)	2.28	(1.03)
12B	8 ⁵ / ₈	(219.08)	12	(304.8)	16	8	(200)	2.83	(1.28)
12C	8 ⁵ / ₈	(219.08)	18	(457.2)	16	8	(200)	4.25	(1.93)
13A	9 ⁵ / ₈	(244.48)	12	(304.8)	18	10	(250)	2.54	(1.15)
13B	9 ⁵ / ₈	(244.48)	12	(304.8)	16	10	(250)	3.15	(1.43)
13C	9 ⁵ / ₈	(244.48)	18	(457.2)	16	10	(250)	4.73	(2.15)
14A	10 ³ / ₄	(273.05)	12	(304.8)	18	10	(250)	2.84	(1.29)
14B	10 ³ / ₄	(273.05)	12	(304.8)	16	10	(250)	3.53	(1.60)
14C	10 ³ / ₄	(273.05)	18	(457.2)	16	10	(250)	5.30	(2.40)
14D	10 ³ / ₄	(273.05)	24	(609.6)	14	10	(250)	9.63	(4.37)
15B	11 ³ / ₄	(298.45)	12	(304.8)	16	12	(300)	4.00	(1.81)
15C	11 ³ / ₄	(298.45)	18	(457.2)	16	12	(300)	6.00	(2.72)
15D	11 ³ / ₄	(298.45)	24	(609.6)	14	12	(300)	10.00	(4.54)
16B	12 ³ / ₄	(323.85)	12	(304.8)	16	12	(300)	4.18	(1.90)

Size No.	Shield I.D.		Shield Length		Shield Gauge	Hanger Size		Wt. Each	
								lbs.	kg
16C	12 ³ / ₄	(323.85)	18	(457.2)	16	12	(300)	6.28	(2.85)
16D	12 ³ / ₄	(323.85)	24	(609.6)	14	12	(300)	10.90	(4.94)
17B	14	(355.60)	12	(304.8)	16	14	(350)	4.58	(2.08)
17D	14	(355.60)	24	(609.6)	14	14	(350)	12.25	(5.56)
18B	15	(381.00)	12	(304.8)	16	16	(400)	4.90	(2.22)
18D	15	(381.00)	24	(609.6)	14	16	(400)	13.00	(5.90)
19B	16	(406.40)	12	(304.8)	16	16	(400)	5.20	(2.36)
19D	16	(406.40)	24	(609.6)	14	16	(400)	13.81	(6.26)
20B	17	(431.80)	12	(304.8)	16	18	(450)	5.53	(2.51)
20D	17	(431.80)	24	(609.6)	14	18	(450)	14.56	(6.60)
21B	18	(457.20)	12	(304.8)	16	18	(450)	6.20	(2.81)
21D	18	(457.20)	24	(609.6)	14	18	(450)	15.46	(7.01)
21E	18	(457.20)	24	(609.6)	12	18	(450)	21.25	(9.64)
22B	19	(482.60)	12	(304.8)	16	20	(500)	6.50	(2.95)
22D	19	(482.60)	24	(609.6)	14	20	(500)	16.32	(7.40)
22E	19	(482.60)	24	(609.6)	12	20	(500)	22.41	(10.17)
23B	20	(508.00)	12	(304.8)	16	20	(500)	7.25	(3.29)
23D	20	(508.00)	24	(609.6)	14	20	(500)	17.18	(7.79)
23E	20	(508.00)	24	(609.6)	12	20	(500)	24.75	(11.23)
24B	21	(533.40)	12	(304.8)	16	24	(600)	7.30	(3.31)
24E	21	(533.40)	24	(609.6)	12	24	(600)	24.75	(11.23)
25B	22	(558.80)	12	(304.8)	16	24	(600)	7.60	(3.45)
25E	22	(558.80)	24	(609.6)	12	24	(600)	25.92	(11.76)
26B	23	(584.20)	12	(304.8)	16	24	(600)	7.75	(3.52)
26E	23	(584.20)	24	(609.6)	12	24	(600)	26.50	(12.02)
27B	24	(609.60)	12	(304.8)	16	24	(600)	8.00	(3.63)
27E	24	(609.60)	24	(609.6)	12	24	(600)	27.20	(12.34)
28E	26	(660.40)	24	(609.6)	12	30	(750)	28.00	(12.70)
29E	27	(685.80)	24	(609.6)	12	30	(750)	30.20	(13.70)
30E	28	(711.20)	24	(609.6)	12	30	(750)	32.50	(14.74)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

INSULATION SHIELDS

FIG. 145, 155, 160, 170, & 455

SHIELD SELECTION GUIDE

TO DETERMINE PROPER SHIELD SIZE FOR SIZES NOT LISTED:

Add 2 times the thickness of the insulation plus the measured O.D. of the pipe. Select shield with I.D. no smaller than the sum total of measured pipe O.D. and twice the insulation.

SHIELD NUMBER FOR STEEL PIPE

Pipe Size		Pipe O.D.		Insulation Thickness								
				1/2(12.7)	3/4(19.0)	1(25.4)	1 1/2(38.1)	2(50.8)	2 1/2(63.5)	3(76.2)	3 1/2(88.9)	4(101.6)
1/2	(15)	.840	(21.34)	1	1	3	5	7	9	11	--	--
3/4	(20)	1.050	(26.67)	1	2	4	5	7	10	11	--	--
1	(25)	1.315	(33.40)	1	3	4	6	8	10	11	12	13
1 1/4	(32)	1.660	(42.16)	3	4	5	7	8	10	11	12	13
1 1/2	(40)	1.900	(48.26)	3	4	5	7	9	11	12	13	14
2	(50)	2.375	(60.33)	4	5	6	8	10	11	12	13	14
2 1/2	(65)	2.875	(73.03)	5	6	7	9	11	12	13	14	15
3	(80)	3.500	(88.90)	6	7	8	10	11	12	13	14	15
3 1/2	(90)	4.000	(101.60)	7	8	9	11	12	13	14	15	16
4	(100)	4.500	(114.30)	8	9	10	11	12	13	14	15	16
5	(125)	5.563	(141.30)	10	11	11	12	13	14	15	16	17
6	(150)	6.625	(168.28)	11	12	12	13	14	15	16	17	18
8	(200)	8.626	(219.10)	13	14	14	15	16	17	18	19	20
10	(250)	10.750	(273.05)	15	16	16	17	18	19	20	21	22
12	(300)	12.750	(323.85)	17	18	18	19	20	21	22	23	24

SHIELD NUMBER FOR COPPER TUBING

Tube Size		Tube O.D.		Insulation Thickness							
				1/2(12.7)	3/4(19.0)	1(25.4)	1 1/2(38.1)	2(50.8)	2 1/2(63.5)	3(76.2)	
1/2	(15)	0.625	(15.9)	1	1	2	5	7	8	10	
3/4	(20)	0.875	(22.2)	1	1	3	5	7	9	11	
1	(25)	1.125	(28.6)	1	2	4	6	8	10	11	
1 1/4	(32)	1.375	(34.9)	1	3	4	6	8	10	11	
1 1/2	(40)	1.625	(41.3)	2	4	5	7	8	10	11	
2	(50)	2.125	(54.0)	4	5	6	8	10	11	12	
2 1/2	(65)	2.625	(66.7)	5	6	7	8	10	11	12	
3	(80)	3.125	(79.4)	6	7	8	10	11	12	13	
3 1/2	(90)	3.625	(92.1)	7	8	8	10	11	12	13	
4	(100)	4.125	(104.8)	8	8	10	11	12	13	14	
5	(125)	5.125	(130.2)	10	10	11	12	13	14	15	
6	(150)	6.125	(155.6)	11	11	12	13	14	15	16	

For Fig. 170

Specify Shield Type & Shield Number

Shield Type	Length		Gauge
A	12	(304.8)	18
B	12	(304.8)	16
C	18	(457.2)	16
D	24	(609.6)	14
E	24	(609.6)	12

Fig. 455 & 456

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

INSULATION



SNAPPITZ SELF-LOCKING INSULATION

FIG. 165 & 166

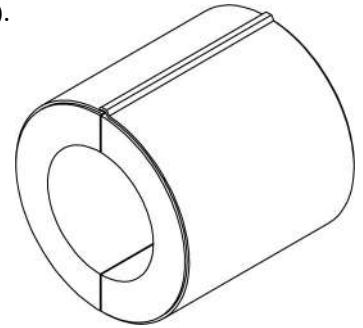
Function: Designed for the insulation of iron pipe (Fig. 165) or copper tube (Fig. 166). The one piece self-locking design allows for easier and faster installation and eliminates the need for a separate shield.

Material: PVC plastic shield with polyisocyanurate or phenolic foam insulation.

Approvals: ASTM-E84-05 and tested by Intertek. Smoke & flame tested 5-30.

Ordering: Specify figure number, pipe or tube size, and insulation thickness.

NOTE: Other sizes available upon request.



Iron Pipe Size		Insulation Thickness		Length		Wt. Each	
						lbs.	kg
1/2	(15)	1/2	(12.7)	4	(101.6)	0.078	(.04)
1/2	(15)	1	(25.4)	4	(101.6)	0.143	(.06)
1/2	(15)	1 1/2	(38.1)	4	(101.6)	0.200	(.09)
1/2	(15)	2	(50.8)	4	(101.6)	0.263	(.12)
1/2	(15)	2 1/2	(63.5)	4	(101.6)	0.263	(.12)
1/2	(15)	3	(76.2)	4	(101.6)	0.333	(.15)
3/4	(20)	1/2	(12.7)	4	(101.6)	0.097	(.04)
3/4	(20)	1	(25.4)	4	(101.6)	0.143	(.06)
3/4	(20)	1 1/2	(38.1)	4	(101.6)	0.171	(.08)
3/4	(20)	2	(50.8)	4	(101.6)	0.228	(.10)
3/4	(20)	2 1/2	(63.5)	4	(101.6)	0.228	(.10)
3/4	(20)	3	(76.2)	4	(101.6)	0.346	(.16)
1	(25)	1/2	(12.7)	4	(101.6)	0.109	(.05)
1	(25)	1	(25.4)	4	(101.6)	0.149	(.07)
1	(25)	1 1/2	(38.1)	4	(101.6)	0.253	(.11)
1	(25)	2	(50.8)	4	(101.6)	0.211	(.10)
1	(25)	2 1/2	(63.5)	4	(101.6)	0.320	(.15)
1	(25)	3	(76.2)	4	(101.6)	0.320	(.15)
1 1/4	(32)	1/2	(12.7)	4	(101.6)	0.143	(.06)
1 1/4	(32)	1	(25.4)	4	(101.6)	0.149	(.07)
1 1/4	(32)	1 1/2	(38.1)	4	(101.6)	0.292	(.13)
1 1/4	(32)	2	(50.8)	4	(101.6)	0.263	(.12)
1 1/4	(32)	2 1/2	(63.5)	4	(101.6)	0.346	(.16)
1 1/2	(40)	1/2	(12.7)	4	(101.6)	0.143	(.06)
1 1/2	(40)	1	(25.4)	4	(101.6)	0.200	(.09)
1 1/2	(40)	1 1/2	(38.1)	4	(101.6)	0.264	(.12)
1 1/2	(40)	2	(50.8)	4	(101.6)	0.417	(.19)
1 1/2	(40)	2 1/2	(63.5)	4	(101.6)	0.347	(.16)
2	(50)	1/2	(12.7)	4	(101.6)	0.229	(.10)
2	(50)	1	(25.4)	4	(101.6)	0.500	(.23)
2	(50)	1 1/2	(38.1)	4	(101.6)	0.526	(.24)
2	(50)	2	(50.8)	4	(101.6)	0.417	(.19)
2	(50)	2 1/2	(63.5)	4	(101.6)	0.347	(.16)
2 1/2	(65)	1/2	(12.7)	4	(101.6)	0.329	(.15)
2 1/2	(65)	1	(25.4)	4	(101.6)	0.429	(.19)
2 1/2	(65)	1 1/2	(38.1)	4	(101.6)	0.469	(.21)
2 1/2	(65)	2	(50.8)	4	(101.6)	0.600	(.27)
3	(80)	1/2	(12.7)	6	(152.4)	0.750	(.34)
3	(80)	1	(25.4)	6	(152.4)	0.750	(.34)
3	(80)	1 1/2	(38.1)	6	(152.4)	1.250	(.57)
3	(80)	2	(50.8)	6	(152.4)	1.300	(.59)
3 1/2	(90)	1	(25.4)	6	(152.4)	0.417	(.19)
3 1/2	(90)	1 1/2	(38.1)	6	(152.4)	0.417	(.19)
4	(100)	1/2	(12.7)	6	(152.4)	1.250	(.57)
4	(100)	1	(25.4)	6	(152.4)	1.250	(.57)
4	(100)	1 1/2	(38.1)	6	(152.4)	1.364	(.62)
5	(125)	1/2	(12.7)	6	(152.4)	0.416	(.19)
5	(125)	1	(25.4)	6	(152.4)	0.416	(.19)
6	(150)	1/2	(12.7)	6	(152.4)	0.500	(.23)

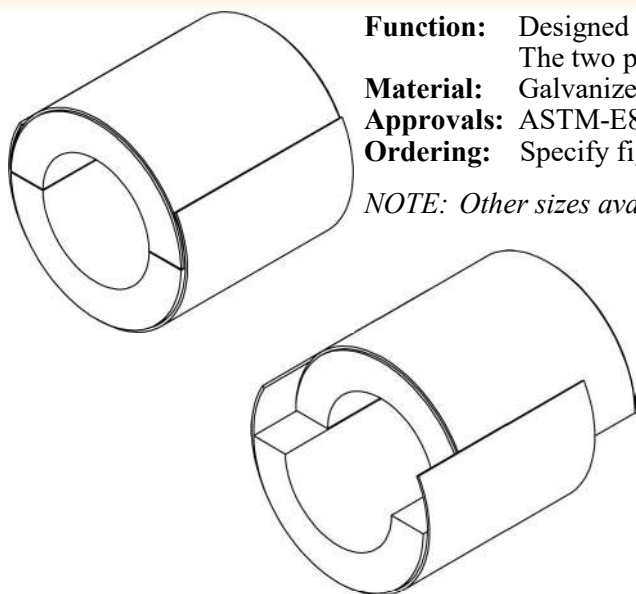
Copper Tube Size		Insulation Thickness		Length		Wt. Each	
						lbs.	kg
1/2	(15)	1/2	(12.7)	4	(101.6)	0.153	(.07)
1/2	(15)	1	(25.4)	4	(101.6)	0.153	(.07)
1/2	(15)	1 1/2	(38.1)	4	(101.6)	0.273	(.12)
1/2	(15)	2	(50.8)	4	(101.6)	0.293	(.13)
1/2	(15)	2 1/2	(63.5)	4	(101.6)	0.320	(.15)
1/2	(15)	3	(76.2)	4	(101.6)	0.400	(.18)
3/4	(20)	1/2	(12.7)	4	(101.6)	0.143	(.06)
3/4	(20)	1	(25.4)	4	(101.6)	0.153	(.07)
3/4	(20)	1 1/2	(38.1)	4	(101.6)	0.238	(.11)
3/4	(20)	2	(50.8)	4	(101.6)	0.248	(.11)
3/4	(20)	2 1/2	(63.5)	4	(101.6)	0.416	(.19)
3/4	(20)	3	(76.2)	4	(101.6)	0.480	(.22)
1	(25)	1/2	(12.7)	4	(101.6)	0.143	(.06)
1	(25)	1	(25.4)	4	(101.6)	0.153	(.07)
1	(25)	1 1/2	(38.1)	4	(101.6)	0.285	(.13)
1	(25)	2	(50.8)	4	(101.6)	0.295	(.13)
1	(25)	2 1/2	(63.5)	4	(101.6)	0.400	(.18)
1	(25)	3	(76.2)	4	(101.6)	0.480	(.22)
1 1/4	(32)	1/2	(12.7)	4	(101.6)	0.190	(.09)
1 1/4	(32)	1	(25.4)	4	(101.6)	0.208	(.09)
1 1/4	(32)	1 1/2	(38.1)	4	(101.6)	0.300	(.14)
1 1/4	(32)	2	(50.8)	4	(101.6)	0.310	(.14)
1 1/4	(32)	2 1/2	(63.5)	4	(101.6)	0.400	(.18)
1 1/4	(32)	3	(76.2)	4	(101.6)	0.480	(.22)
1 1/2	(40)	1/2	(12.7)	4	(101.6)	0.213	(.10)
1 1/2	(40)	1	(25.4)	4	(101.6)	0.213	(.10)
1 1/2	(40)	1 1/2	(38.1)	4	(101.6)	0.417	(.19)
1 1/2	(40)	2	(50.8)	4	(101.6)	0.420	(.19)
1 1/2	(40)	2 1/2	(63.5)	4	(101.6)	0.400	(.18)
2	(50)	1/2	(12.7)	4	(101.6)	0.286	(.13)
2	(50)	1	(25.4)	4	(101.6)	0.286	(.13)
2	(50)	1 1/2	(38.1)	4	(101.6)	0.417	(.19)
2	(50)	2	(50.8)	4	(101.6)	0.427	(.19)
2	(50)	2 1/2	(63.5)	4	(101.6)	0.300	(.14)
2 1/2	(65)	1/2	(12.7)	4	(101.6)	0.449	(.20)
2 1/2	(65)	1	(25.4)	4	(101.6)	1.100	(.50)
2 1/2	(65)	1 1/2	(38.1)	4	(101.6)	0.469	(.21)
2 1/2	(65)	2	(50.8)	4	(101.6)	0.469	(.21)
2 1/2	(65)	2 1/2	(63.5)	4	(101.6)	0.200	(.09)
3	(80)	1/2	(12.7)	6	(152.4)	0.156	(.07)
3	(80)	1	(25.4)	6	(152.4)	0.313	(.14)
3	(80)	1 1/2	(38.1)	6	(152.4)	0.429	(.19)
3	(80)	2	(50.8)	6	(152.4)	0.416	(.19)
4	(100)	1	(25.4)	6	(152.4)	0.571	(.26)
4	(100)	1 1/2	(38.1)	6	(152.4)	0.682	(.31)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

INSULATION

FIG. 167 & 168

SNAPPITZ NON-LOCKING INSULATION



Function: Designed for the insulation of iron pipe (**Fig. 167**) or copper tube (**Fig. 168**). The two piece non-locking design eliminates the need for a separate shield.

Material: Galvanized metal shield with polyisocyanurate or phenolic foam insulation

Approvals: ASTM-E84-05 and tested by Intertek. Smoke & flame tested 5-30.

Ordering: Specify figure number, pipe or tube size, and insulation thickness.

NOTE: Other sizes available upon request.

Copper Tube Size		Insulation Thickness		Length		Wt. Each	
						lbs.	kg
1½	(40)	3	(76.2)	4	(101.6)	.0958	(.04)
2	(50)	3	(76.2)	4	(101.6)	1.273	(.58)
2½	(65)	3	(76.2)	4	(101.6)	1.364	(.62)
3	(80)	2½	(63.5)	6	(152.4)	1.477	(.67)
3	(80)	3	(76.2)	6	(152.4)	1.477	(.67)
4	(100)	2	(50.8)	6	(152.4)	1.636	(.74)
4	(100)	2½	(63.5)	6	(152.4)	3.125	(1.42)
4	(100)	3	(76.2)	6	(152.4)	3.750	(1.70)

Iron Pipe Size		Insulation Thickness		Length		Wt. Each	
						lbs.	kg
1½	(32)	3	(76.2)	4	(101.6)	0.893	(.41)
1½	(40)	3	(76.2)	4	(101.6)	0.833	(.38)
2	(50)	3	(76.2)	4	(101.6)	0.833	(.38)
2½	(65)	2½	(63.5)	4	(101.6)	1.667	(.76)
2½	(65)	3	(76.2)	6	(152.4)	2.083	(.94)
3	(80)	2½	(63.5)	6	(152.4)	2.500	(1.13)
3	(80)	3	(76.2)	6	(152.4)	1.458	(.66)
3½	(90)	2	(50.8)	6	(152.4)	2.500	(1.13)
3½	(90)	2½	(63.5)	6	(152.4)	3.000	(1.36)
3½	(90)	3	(76.2)	6	(152.4)	2.500	(1.13)
4	(100)	2	(50.8)	6	(152.4)	3.750	(1.70)
4	(100)	2½	(63.5)	6	(152.4)	3.750	(1.70)
4	(100)	3	(76.2)	6	(152.4)	3.750	(1.70)
5	(125)	1½	(25.4)	6	(152.4)	3.125	(1.42)
5	(125)	2	(38.1)	6	(152.4)	3.750	(1.70)
5	(125)	2½	(50.8)	6	(152.4)	3.750	(1.70)
5	(125)	3	(63.5)	6	(152.4)	4.688	(2.13)
6	(150)	1	(25.4)	6	(152.4)	2.500	(1.13)
6	(150)	1½	(38.1)	6	(152.4)	2.750	(1.25)
6	(150)	2	(50.8)	6	(152.4)	4.000	(1.81)
6	(150)	2½	(63.5)	6	(152.4)	6.250	(2.83)
6	(150)	3	(76.2)	6	(152.4)	9.375	(4.25)
8	(200)	1	(25.4)	9	(228.6)	3.000	(1.36)
8	(200)	1½	(38.1)	9	(228.6)	3.000	(1.36)
8	(200)	2	(50.8)	9	(228.6)	4.000	(1.81)
8	(200)	2½	(63.5)	9	(228.6)	7.500	(3.40)
8	(200)	3	(76.2)	9	(228.6)	7.500	(3.40)
10	(250)	1	(25.4)	9	(228.6)	4.000	(1.81)
10	(250)	1½	(38.1)	9	(228.6)	4.000	(1.81)
10	(250)	2	(50.8)	9	(228.6)	4.000	(1.81)
10	(250)	2½	(63.5)	12	(304.8)	8.000	(3.63)
10	(250)	3	(76.2)	12	(304.8)	8.000	(3.63)
12	(300)	1	(25.4)	12	(304.8)	8.000	(3.63)
12	(300)	1½	(38.1)	12	(304.8)	8.000	(3.63)
12	(300)	2	(50.8)	12	(304.8)	8.000	(3.63)
12	(300)	2½	(63.5)	12	(304.8)	8.000	(3.63)
12	(300)	3	(76.2)	12	(304.8)	8.000	(3.63)
14	(350)	1	(25.4)	12	(304.8)	10.00	(4.54)
14	(350)	1½	(38.1)	12	(304.8)	10.00	(4.54)
14	(350)	2	(50.8)	12	(304.8)	10.00	(4.54)
14	(350)	2½	(63.5)	12	(304.8)	10.00	(4.54)
14	(350)	3	(76.2)	12	(304.8)	10.00	(4.54)
16	(400)	1	(25.4)	18	(457.2)	20.00	(9.07)
16	(400)	1½	(38.1)	18	(457.2)	20.00	(9.07)
16	(400)	2	(50.8)	18	(457.2)	20.00	(9.07)
16	(400)	2½	(63.5)	18	(457.2)	20.00	(9.07)
16	(400)	3	(76.2)	18	(457.2)	20.00	(9.07)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

PIPE COVERING PROTECTION SADDLES



PIPE SADDLE FOR 1" & 1 1/2" INSULATION

FIG. 651 & 653

- Function:** Designed to protect insulation on high temperature pipe lines. The saddle is furnished with notches to minimize surface contact with the pipe, thereby keeping heat loss to a minimum.
- Material:** Carbon steel (Type 304 or 316 Stainless Steel upon request)
- Finish:** Plain or electro-galvanized (Hot dipped galvanized upon request)
- Approvals:** Complies with Federal Specification A-A-1192A (Type 39) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 39) which supersedes ANSI/MSS SP-69.
- Ordering:** Specify figure number, pipe size, insulation thickness, material, and finish.

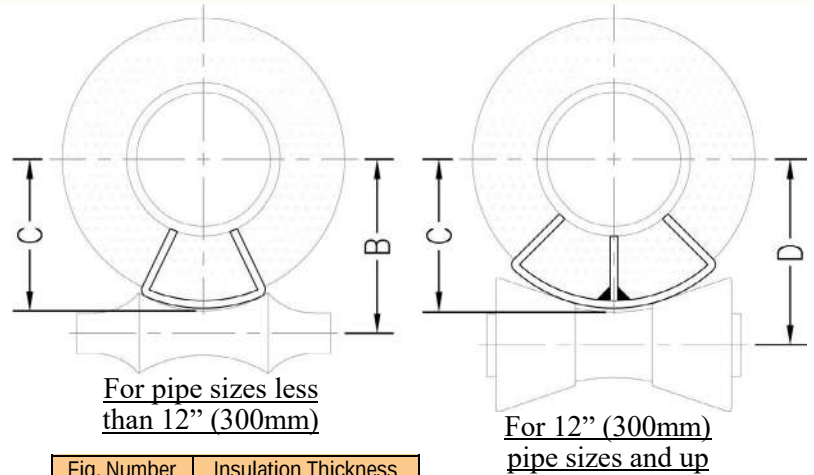


Fig. Number	Insulation Thickness
651	1 (25.4)
653	1 1/2 (38.1)

Fig. Number	Pipe Size		Pipe Roller Size			Fig. 460, 480 490 B	Fig. 470 475 B	C		Fig. 486 487 D	Actual Thickness Of Covering	Max. Rec. Load		Wt. Each					
			Use With Fig. No.									lbs.	kN	lbs.	kg				
			460, 480 490	470 475	486 487														
651	3/4	(20)	2	2 1/2	2-3 1/2	2 1/16	(52.39)	2 1/8	(53.98)	1 5/8	(41.28)	2 1/4	(57.15)	1 5/16	(23.81)	1200	(5.34)	1.41	(.64)
651	1	(25)	2 1/2	3	2-3 1/2	2 5/16	(58.74)	2 1/4	(57.15)	1 13/16	(46.04)	2 7/16	(61.91)	1 1/16	(26.99)	1200	(5.34)	1.41	(.64)
651	1 1/4	(32)	2 1/2	3	2-3 1/2	2 1/2	(63.50)	2 7/16	(61.91)	1 15/16	(49.21)	2 9/16	(65.09)	1 5/16	(23.81)	1200	(5.34)	1.41	(.64)
651	1 1/2	(40)	3	3 1/2	2-3 1/2	2 5/8	(66.68)	2 5/8	(66.68)	2 1/8	(53.98)	2 11/16	(68.26)	1 1/16	(26.99)	1200	(5.34)	1.43	(.65)
651	2	(50)	3 1/2	4	2-3 1/2	3	(76.20)	2 15/16	(74.61)	2 3/8	(60.33)	3 1/16	(77.79)	1 1/16	(26.99)	1200	(5.34)	1.52	(.69)
651	2 1/2	(65)	3 1/2	5	2-3 1/2	3 1/4	(82.55)	3 1/4	(82.55)	2 11/16	(68.26)	3 9/16	(84.14)	1 1/16	(26.99)	1200	(5.34)	1.52	(.69)
651	3	(80)	4	5	2-3 1/2	3 1/2	(88.90)	3 1/2	(88.90)	2 15/16	(74.61)	3 9/16	(90.49)	1 1/16	(26.99)	1200	(5.34)	1.63	(.74)
651	3 1/2	(90)	5	6	4-6	4	(101.60)	4	(101.60)	3 5/16	(84.14)	3 15/16	(100.01)	1 5/16	(33.34)	1200	(5.34)	1.98	(.90)
651	4	(100)	5	6	4-6	4 1/4	(107.95)	4 1/4	(107.95)	3 9/16	(90.49)	4 3/16	(106.36)	1 1/16	(26.99)	1800	(8.01)	1.98	(.90)
651	5	(125)	6	8	4-6	4 13/16	(122.24)	4 13/16	(122.24)	4 1/8	(104.78)	4 3/4	(120.65)	1 1/16	(26.99)	1800	(8.01)	1.98	(.90)
651	6	(150)	8	8	4-6	5 3/8	(136.53)	5 3/8	(161.93)	4 1/2	(114.30)	5 1/4	(133.35)	1	(25.40)	1800	(8.01)	3.91	(1.64)
651	8	(200)	10	12	8-10	7 1/16	(179.39)	7 1/16	(179.39)	6	(152.40)	7 1/16	(179.39)	1 1/16	(26.99)	1800	(8.01)	4.75	(2.15)
651	10	(250)	12	14	8-10	8 5/16	(211.14)	8 1/2	(215.90)	7 1/4	(184.15)	8 5/16	(211.14)	1	(25.40)	1800	(8.01)	4.75	(2.15)
651	12	(300)	14	16	12-14	8 15/16	(227.01)	8 7/8	(225.43)	7 5/8	(193.68)	8 13/16	(223.84)	1 1/8	(28.58)	5000	(22.24)	6.88	(3.12)
651	14	(350)	16	18	12-14	9 5/8	(244.48)	9 5/8	(244.48)	8 1/4	(209.55)	9 1/2	(241.30)	1	(25.40)	5000	(22.24)	6.88	(3.12)
653	3/4	(20)	3	3 1/2	2-3 1/2	2 3/4	(69.85)	2 3/4	(69.85)	2 3/16	(55.56)	2 7/8	(73.03)	1 1/2	(38.10)	1200	(5.34)	1.85	(.84)
653	1	(25)	3	4	2-3 1/2	2 7/8	(73.03)	2 7/8	(73.03)	2 5/16	(58.74)	3	(76.20)	1 9/16	(39.69)	1200	(5.34)	1.85	(.84)
653	1 1/4	(32)	3 1/2	5	2-3 1/2	3 1/16	(77.79)	3 1/16	(77.79)	2 9/16	(65.09)	3 3/16	(80.96)	1 11/16	(42.86)	1200	(5.34)	1.85	(.84)
653	1 1/2	(40)	3 1/2	5	2-3 1/2	3 1/4	(82.55)	3 1/4	(82.55)	2 5/8	(66.68)	3 5/16	(84.14)	1 9/16	(39.69)	1200	(5.34)	1.85	(.84)
653	2	(50)	4	5	2-3 1/2	3 1/2	(88.90)	3 1/2	(88.90)	2 7/8	(73.03)	3 9/16	(90.49)	1 5/8	(41.28)	1200	(5.34)	1.98	(.90)
653	2 1/2	(65)	5	6	4-6	4	(101.60)	4	(101.60)	3 5/16	(84.14)	3 15/16	(100.01)	1 7/8	(47.63)	1200	(5.34)	2.25	(1.02)
653	3	(80)	5	6	4-6	4 5/16	(109.54)	4 5/16	(109.54)	3 5/8	(92.08)	4 1/4	(107.95)	1 9/16	(39.69)	1200	(5.34)	2.25	(1.02)
653	3 1/2	(90)	6	8	4-6	4 9/16	(115.89)	4 9/16	(115.89)	3 11/16	(93.66)	4 1/2	(114.30)	1 13/16	(46.04)	1200	(5.34)	2.50	(1.13)
653	4	(100)	6	8	4-6	4 7/8	(123.83)	4 7/8	(123.83)	4 1/16	(103.19)	4 3/4	(120.65)	1 9/16	(39.69)	1800	(8.01)	2.50	(1.13)
653	5	(125)	8	8	4-6	5 1/2	(139.70)	5 1/2	(139.70)	4 11/16	(119.06)	5 3/8	(136.53)	1 9/16	(39.69)	1800	(8.01)	2.50	(1.13)
653	6	(150)	8	10	8-10	5 7/8	(149.23)	5 11/16	(144.46)	5 1/16	(128.59)	6	(152.40)	1 1/2	(38.10)	1800	(8.01)	4.25	(1.93)
653	8	(200)	10	12	8-10	7 1/16	(179.39)	7 1/16	(179.39)	6	(152.40)	7 1/16	(179.39)	1 9/16	(39.69)	1800	(8.01)	5.50	(2.49)
653	10	(250)	12	14	8-10	8 5/16	(211.14)	8 1/2	(215.90)	7 1/4	(184.15)	8 5/16	(211.14)	1 5/8	(41.28)	1800	(8.01)	5.50	(2.49)
653	12	(300)	14	16	12-14	9 1/2	(241.30)	9 1/2	(241.30)	8 1/16	(204.79)	9 1/4	(234.95)	1 5/8	(41.28)	5000	(22.24)	8.33	(3.78)
653	14	(350)	16	18	12-14	10 3/16	(258.76)	10 1/8	(257.18)	8 3/4	(222.25)	10 1/16	(255.59)	1 1/2	(38.10)	5000	(22.24)	8.33	(3.78)
653	16	(400)	18	20	16-20	11 1/4	(285.75)	11 1/4	(285.75)	9 13/16	(249.24)	11 1/8	(282.58)	1 1/2	(38.10)	5000	(22.24)	9.01	(4.09)
653	18	(450)	20	24	16-20	12 5/16	(312.74)	--	--	10 13/16	(274.64)	12 3/16	(309.56)	1 1/2	(38.10)	5000	(22.24)	9.68	(4.39)
653	20	(500)	24	24	24	13 9/16	(344.49)	--	--	11 5/8	(295.28)	13 1/16	(331.79)	1 1/2	(38.10)	7200	(32.03)	11.00	(4.99)
653	24	(600)	30	--	30	16 5/16	(414.34)	--	--	13 1/2	(342.90)	15 1/4	(387.35)	1 1/2	(38.10)	7200	(32.03)	13.00	(5.90)
653	30	(750)	--	--	36-42	--	--	--	--	16 11/16	(423.86)	18 5/16	(465.14)	1 1/2	(38.10)	7200	(32.03)	13.70	(6.21)
653	36	(900)	--	--	36-42	--	--	--	--	19 11/16	(500.06)	21 7/16	(544.51)	1 1/2	(38.10)	7200	(32.03)	15.74	(7.14)

Maximum recommended loads are applicable only when the saddle is used on a flat bearing surface and tack welded to the pipe. When a saddle is used with a pipe roll, the maximum load given for the pipe roll applies to the saddle.

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

THREADED ACCESSORIES

CPVC STRAPS

BAND HANGERS

BEAM CLAMPS

CLEVIS HANGERS

PIPE ROLLER SUPPORTS

SPLIT RING HANGERS

PIPE CLAMPS

CENTER LOAD BEAM CLAMPS

PIPE SHIELDS, INSULATION, & SADDLES

PIPE GUIDES & SLIDES

WALL BRACKETS

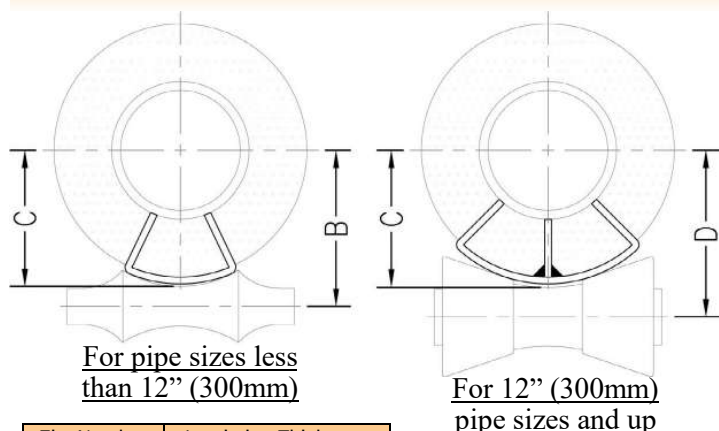
PIPE SUPPORTS

STRUCTURAL ATTACHMENTS

SEISMIC BRACING

FIG. 654 & 655

PIPE SADDLE FOR 2" & 2 1/2" INSULATION



Function: Designed to protect insulation on high temperature pipe lines. The saddle is furnished with notches to minimize surface contact with the pipe, thereby keeping heat loss to a minimum.

Material: Carbon steel (Type 304 or 316 Stainless Steel upon request)

Finish: Plain or electro-galvanized (Hot dipped galvanized upon request)

Approvals: Complies with Federal Specification A-A-1192A (Type 39) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 39) which supersedes ANSI/MSS SP-69.

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

Fig. Number	Insulation Thickness	
654	2	(50.8)
655	2 1/2	(63.5)

Fig. Number	Pipe Size		Pipe Roller Size			Fig. 460, 480 490 B		Fig. 470 475 B		C		Fig. 486 487 D		Actual Thickness Of Covering		Max. Rec. Load		Wt. Each	
			Use With Fig. No.													lbs.	kN	lbs.	kg
			460, 480 490	470 475	486 487														
654	3/4	(20)	4	5	2-3 1/2	3 5/16 (84.14)	3 5/16 (84.14)	2 11/16 (68.26)	3 3/8 (85.73)	2 (50.80)	2	(50.80)	1200 (5.34)	2.58 (1.17)					
654	1	(25)	4	5	2-3 1/2	3 1/2 (88.90)	3 1/2 (88.90)	2 7/8 (73.03)	3 1/2 (88.90)	2 1/8 (53.98)	2 1/8 (53.98)	(53.98)	1200 (5.34)	2.58 (1.17)					
654	1 1/4	(32)	4	5	2-3 1/2	3 5/8 (92.08)	3 5/8 (92.08)	3 (76.20)	3 11/16 (93.66)	1 15/16 (49.21)	1200 (5.34)	2.58 (1.17)							
654	1 1/2	(40)	5	6	4-6	4 (101.60)	4 (101.60)	3 5/16 (84.14)	3 7/8 (98.43)	2 3/8 (60.33)	1800 (8.01)	2.85 (1.29)							
654	2	(50)	5	6	4-6	4 1/4 (107.95)	4 1/4 (107.95)	3 9/16 (90.49)	4 3/16 (106.36)	2 1/8 (53.98)	1800 (8.01)	2.85 (1.29)							
654	2 1/2	(65)	6	8	4-6	4 1/2 (114.30)	4 5/8 (117.48)	3 7/8 (98.43)	4 1/2 (114.30)	2 3/8 (60.33)	1800 (8.01)	2.85 (1.29)							
654	3	(80)	6	8	4-6	4 13/16 (122.24)	4 13/16 (122.24)	4 1/8 (104.78)	4 11/16 (119.06)	2 1/16 (52.39)	1800 (8.01)	3.30 (1.50)							
654	3 1/2	(90)	8	8	4-6	5 1/8 (130.18)	5 1/8 (130.18)	4 5/16 (109.54)	5 (127.00)	2 5/16 (58.74)	1800 (8.01)	3.30 (1.50)							
654	4	(100)	8	8	4-6	5 3/8 (136.53)	5 3/8 (136.53)	4 9/16 (115.89)	5 1/4 (133.35)	2 1/16 (52.39)	1800 (8.01)	3.30 (1.50)							
654	5	(125)	8	10	8-10	6 (152.40)	6 1/16 (153.99)	5 3/16 (131.76)	6 1/8 (155.58)	2 1/16 (52.39)	1800 (8.01)	3.30 (1.50)							
654	6	(150)	10	10	8-10	6 7/16 (163.51)	6 7/16 (163.51)	5 1/2 (139.70)	6 1/2 (165.10)	2 1/16 (52.39)	1800 (8.01)	5.25 (2.38)							
654	8	(200)	10	12	8-10	7 9/16 (192.09)	7 9/16 (192.09)	6 1/2 (165.10)	7 9/16 (192.09)	2 1/16 (52.39)	1800 (8.01)	6.10 (2.77)							
654	10	(250)	14	16	12-14	9 1/16 (230.19)	9 (228.60)	7 5/8 (193.68)	8 3/16 (223.84)	2 1/8 (53.98)	1800 (8.01)	7.05 (3.20)							
654	12	(300)	16	18	16-20	10 3/16 (258.76)	10 1/16 (255.59)	8 5/8 (219.08)	10 (254.00)	2 1/8 (53.98)	5000 (22.24)	9.33 (4.23)							
654	14	(350)	16	18	16-20	10 7/8 (276.23)	10 13/16 (274.64)	9 5/16 (236.54)	10 11/16 (271.46)	2 (50.80)	5000 (22.24)	9.33 (4.23)							
654	16	(400)	18	20	16-20	11 3/16 (284.16)	11 3/4 (285.75)	10 3/16 (258.76)	11 9/16 (293.69)	2 (50.80)	5000 (22.24)	10.68 (4.84)							
654	18	(450)	20	24	24	12 7/8 (327.03)	--	11 5/16 (287.34)	12 11/16 (322.26)	2 (50.80)	7200 (32.03)	10.68 (4.84)							
654	20	(500)	24	24	24	13 3/16 (344.49)	--	12 1/4 (311.15)	13 5/8 (346.08)	2 (50.80)	7200 (32.03)	11.96 (5.42)							
654	24	(600)	30	--	30	16 5/16 (414.34)	--	14 (355.60)	15 3/4 (400.05)	2 (50.80)	7200 (32.03)	13.95 (6.33)							
654	30	(750)	--	--	36-42	--	--	17 3/16 (436.56)	18 13/16 (477.84)	2 (50.80)	7200 (32.03)	15.02 (6.81)							
654	36	(900)	--	--	36-42	--	--	20 3/16 (512.76)	21 15/16 (557.21)	2 (50.80)	7200 (32.03)	17.01 (7.72)							
655	1 1/4	(32)	5	6	4-6	4 3/8 (111.13)	4 3/8 (111.13)	3 3/4 (95.25)	4 3/8 (111.13)	2 1/2 (63.50)	1200 (5.34)	3.25 (1.47)							
655	1 1/2	(40)	6	8	4-6	4 1/2 (114.30)	4 5/8 (117.48)	3 7/8 (98.43)	4 1/2 (114.30)	2 7/8 (73.03)	1800 (8.01)	3.25 (1.47)							
655	2	(50)	6	8	4-6	4 3/4 (120.65)	4 13/16 (122.24)	4 1/16 (103.19)	4 3/4 (120.65)	2 5/8 (66.68)	1800 (8.01)	3.25 (1.47)							
655	2 1/2	(65)	8	8	4-6	5 1/8 (130.18)	5 1/8 (130.18)	4 1/4 (107.95)	5 (127.00)	2 7/8 (73.03)	1800 (8.01)	3.61 (1.64)							
655	3	(80)	8	8	4-6	5 7/16 (138.11)	5 7/16 (138.11)	4 11/16 (119.06)	5 5/16 (134.94)	2 9/16 (65.09)	1800 (8.01)	3.61 (1.64)							
655	3 1/2	(90)	8	10	8-10	5 5/8 (142.88)	5 5/8 (142.88)	4 11/16 (119.06)	5 11/16 (144.46)	2 13/16 (71.44)	1800 (8.01)	3.70 (1.68)							
655	4	(100)	8	10	8-10	5 5/16 (150.81)	5 5/16 (150.81)	5 (127.00)	6 (152.40)	2 9/16 (65.09)	1800 (8.01)	3.70 (1.68)							
655	5	(125)	10	10	8-10	6 9/16 (166.69)	6 9/16 (166.69)	5 5/8 (142.88)	6 5/8 (168.28)	2 5/8 (66.68)	1800 (8.01)	3.70 (1.68)							
655	6	(150)	10	12	8-10	7 1/8 (180.98)	7 3/16 (182.56)	6 3/16 (157.16)	7 1/4 (184.15)	2 9/16 (65.09)	1800 (8.01)	6.10 (2.77)							
655	8	(200)	12	14	8-10	8 5/16 (211.14)	8 1/2 (215.90)	7 1/4 (184.15)	8 5/16 (211.14)	2 11/16 (68.26)	1800 (8.01)	6.80 (3.08)							
655	10	(250)	14	16	12-14	9 9/16 (242.89)	9 9/16 (242.89)	8 1/8 (206.38)	9 9/16 (236.54)	2 5/8 (66.68)	1800 (8.01)	7.10 (3.22)							
655	12	(300)	16	18	16-20	10 11/16 (271.46)	10 9/16 (268.29)	9 1/8 (231.78)	10 1/2 (266.70)	2 5/8 (66.68)	5000 (22.24)	10.93 (4.96)							
655	14	(350)	18	20	16-20	11 5/16 (287.34)	11 3/8 (288.93)	9 7/8 (250.83)	11 3/16 (284.16)	2 1/2 (63.50)	5000 (22.24)	10.93 (4.96)							
655	16	(400)	20	24	16-20	12 5/16 (312.74)	--	10 13/16 (274.64)	12 3/16 (309.56)	2 1/2 (63.50)	7200 (32.03)	11.64 (5.28)							
655	18	(450)	24	24	24	13 9/16 (344.49)	--	11 5/8 (295.28)	13 1/16 (331.79)	2 1/2 (63.50)	7200 (32.03)	12.92 (5.86)							
655	20	(500)	24	--	24	14 11/16 (373.06)	--	12 3/4 (323.85)	14 3/16 (360.36)	2 1/2 (63.50)	7200 (32.03)	12.92 (5.86)							
655	24	(600)	30	--	30	17 1/2 (444.50)	--	14 5/8 (371.48)	16 7/16 (417.51)	2 1/2 (63.50)	7200 (32.03)	14.91 (6.76)							
655	30	(750)	--	--	36-42	--	--	17 11/16 (449.26)	19 5/16 (490.54)	2 1/2 (63.50)	7200 (32.03)	16.40 (7.44)							
655	36	(900)	--	--	36-42	--	--	20 11/16 (525.46)	22 7/16 (569.91)	2 1/2 (63.50)	7200 (32.03)	18.57 (8.42)							

Maximum recommended loads are applicable only when the saddle is used on a flat bearing surface and tack welded to the pipe. When a saddle is used with a pipe roll, the maximum load given for the pipe roll applies to the saddle.

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

PIPE COVERING PROTECTION SADDLES



PIPE SADDLE FOR 3" & 4" INSULATION

FIG. 656 & 658

- Function:** Designed to protect insulation on high temperature pipe lines. The saddle is furnished with notches to minimize surface contact with the pipe, thereby keeping heat loss to a minimum.
- Material:** Carbon steel (Type 304 or 316 Stainless Steel upon request)
- Finish:** Plain or electro-galvanized (Hot dipped galvanized upon request)
- Approvals:** Complies with Federal Specification A-A-1192A (Type 39) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 39) which supersedes ANSI/MSS SP-69.
- Ordering:** Specify figure number, pipe size, insulation thickness, material, and finish.

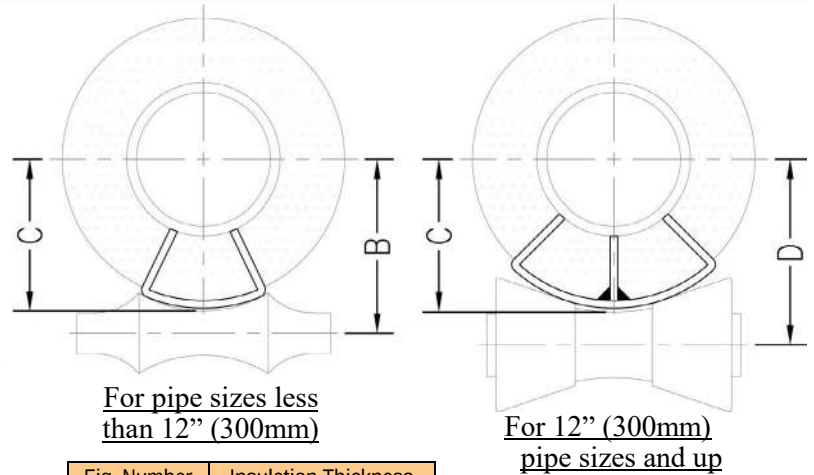


Fig. Number	Insulation Thickness	
656	3	(76.2)
658	4	(101.6)

Fig. Number	Pipe Size		Pipe Roller Size			Fig. 460, 480		Fig. 470		C		Fig. 486		Actual Thickness Of Covering		Max. Rec. Load		Wt. Each	
			Use With Fig. No.																
			460, 480	470	486	490	475	487	lbs.			kN	lbs.	kg					
656	2	(50)	8	8	4-6	5 ³ / ₈	(136.53)	5 ³ / ₈	(136.53)	4 ⁹ / ₁₆	(115.89)	5 ¹ / ₄	(133.35)	3 ¹ / ₈	(79.38)	1800	(8.01)	4.10	(1.86)
656	2 ¹ / ₂	(65)	8	10	4-6	5 ⁵ / ₈	(142.88)	5 ³ / ₄	(146.05)	4 ⁷ / ₈	(123.83)	5 ¹ / ₂	(139.70)	3 ³ / ₈	(85.73)	1800	(8.01)	4.10	(1.86)
656	3	(80)	8	10	8-10	6	(152.40)	6	(152.40)	5 ¹ / ₁₆	(128.59)	6 ¹ / ₁₆	(153.99)	3 ¹ / ₁₆	(77.79)	1800	(8.01)	4.32	(1.96)
656	3 ¹ / ₂	(90)	10	10	8-10	6 ⁵ / ₁₆	(160.34)	6 ⁵ / ₁₆	(160.34)	5 ³ / ₈	(136.53)	6 ³ / ₈	(161.93)	3 ³ / ₈	(85.73)	1800	(8.01)	4.32	(1.96)
656	4	(100)	10	10	8-10	6 ⁹ / ₁₆	(166.69)	6 ⁹ / ₁₆	(166.69)	5 ⁵ / ₈	(142.88)	6 ⁵ / ₈	(168.28)	3 ¹ / ₈	(79.38)	1800	(8.01)	4.32	(1.96)
656	5	(125)	10	12	8-10	7 ¹ / ₈	(180.98)	7 ¹ / ₄	(184.15)	6 ³ / ₁₆	(157.16)	7 ¹ / ₄	(184.15)	3 ¹ / ₈	(79.38)	1800	(8.01)	4.32	(1.96)
656	6	(150)	12	12	8-10	7 ⁵ / ₈	(193.68)	7 ⁵ / ₈	(193.68)	6 ⁹ / ₁₆	(166.69)	7 ⁵ / ₈	(193.68)	3 ¹ / ₁₆	(77.79)	1800	(8.01)	8.10	(3.67)
656	8	(200)	14	16	12-14	9	(228.60)	9	(228.60)	7 ¹¹ / ₁₆	(195.26)	8 ³ / ₄	(222.25)	3 ³ / ₁₆	(80.96)	1800	(8.01)	8.10	(3.67)
656	10	(250)	16	18	16-20	10 ¹ / ₈	(257.18)	10 ¹ / ₁₆	(255.59)	8 ¹¹ / ₁₆	(220.66)	10	(254.00)	3 ¹ / ₈	(79.38)	1800	(8.01)	8.40	(3.81)
656	12	(300)	18	20	16-20	11 ¹ / ₈	(282.58)	11 ¹ / ₄	(285.75)	9 ⁵ / ₈	(244.48)	11	(279.40)	3 ¹ / ₈	(79.38)	5000	(22.24)	11.88	(5.39)
656	14	(350)	18	20	16-20	11 ³ / ₄	(298.45)	11 ³ / ₄	(298.45)	10 ⁵ / ₁₆	(261.94)	11 ⁵ / ₈	(295.28)	3	(76.20)	5000	(22.24)	11.88	(5.39)
656	16	(400)	20	24	24	12 ⁷ / ₈	(327.03)	--	--	11 ¹ / ₁₆	(280.99)	12 ⁷ / ₁₆	(315.91)	3	(76.20)	7200	(32.03)	13.87	(6.29)
656	18	(450)	24	24	24	14 ³ / ₁₆	(360.36)	--	--	12 ¹ / ₄	(311.15)	13 ⁵ / ₈	(346.08)	3	(76.20)	7200	(32.03)	13.87	(6.29)
656	20	(500)	24	--	24	15 ¹ / ₄	(387.35)	--	--	13 ⁵ / ₁₆	(338.14)	14 ³ / ₄	(374.65)	3	(76.20)	7200	(32.03)	14.51	(6.58)
656	24	(600)	30	--	30	18 ¹ / ₁₆	(458.79)	--	--	15 ¹ / ₄	(387.35)	17	(431.80)	3	(76.20)	7200	(32.03)	15.86	(7.19)
656	30	(750)	--	--	36-42	--	--	--	--	18 ¹ / ₈	(460.38)	20 ³ / ₈	(517.53)	3	(76.20)	7200	(32.03)	17.61	(7.99)
656	36	(900)	--	--	36-42	--	--	--	--	21 ¹ / ₈	(536.58)	23 ¹ / ₂	(596.90)	3	(76.20)	7200	(32.03)	19.61	(8.90)
658	2	(50)	8	10	8-10	6 ³ / ₁₆	(157.16)	6 ¹ / ₁₆	(153.99)	5 ¹ / ₁₆	(128.59)	6 ¹ / ₈	(155.58)	4 ³ / ₁₆	(106.36)	1800	(8.01)	5.60	(2.54)
658	2 ¹ / ₂	(65)	8	10	8-10	6 ⁷ / ₁₆	(163.51)	6 ³ / ₈	(161.93)	5 ⁷ / ₁₆	(138.11)	6 ¹ / ₂	(165.10)	4 ⁷ / ₁₆	(112.71)	1800	(8.01)	5.60	(2.54)
658	3	(80)	8	12	8-10	6 ¹⁵ / ₁₆	(177.80)	6 ¹⁵ / ₁₆	(176.21)	5 ¹³ / ₁₆	(147.64)	6 ⁷ / ₈	(174.63)	4 ¹ / ₈	(104.78)	1800	(8.01)	5.60	(2.54)
658	3 ¹ / ₂	(90)	10	12	8-10	7	(177.80)	7 ¹ / ₈	(180.98)	5 ¹⁵ / ₁₆	(150.81)	7 ¹ / ₁₆	(179.39)	4 ³ / ₈	(111.13)	1800	(8.01)	5.90	(2.68)
658	4	(100)	10	12	8-10	7 ⁵ / ₈	(193.68)	7 ⁵ / ₈	(193.68)	6 ¹ / ₂	(165.10)	7 ⁹ / ₁₆	(192.09)	4 ¹ / ₈	(104.78)	1800	(8.01)	5.90	(2.68)
658	5	(125)	12	14	8-10	8 ³ / ₁₆	(207.96)	8 ³ / ₈	(212.73)	7 ¹ / ₈	(180.98)	8 ³ / ₁₆	(207.96)	4 ¹ / ₄	(107.95)	1800	(8.01)	5.90	(2.68)
658	6	(150)	14	16	12-14	9	(228.60)	9	(228.60)	7 ⁹ / ₁₆	(192.09)	8 ³ / ₄	(222.25)	4 ³ / ₁₆	(106.36)	1800	(8.01)	10.68	(4.84)
658	8	(200)	16	18	12-14	10 ¹ / ₈	(257.18)	10 ¹ / ₈	(257.18)	8 ¹¹ / ₁₆	(220.66)	9 ⁷ / ₈	(250.83)	4 ³ / ₁₆	(106.36)	1800	(8.01)	10.68	(4.84)
658	10	(250)	18	20	16-20	11 ¹ / ₄	(285.75)	11 ¹ / ₄	(285.75)	9 ³ / ₄	(247.65)	11 ¹ / ₈	(282.58)	4 ¹ / ₈	(104.78)	1800	(8.01)	11.40	(5.17)
658	12	(300)	20	24	16-20	12 ³ / ₈	(314.33)	--	--	10 ¹³ / ₁₆	(274.64)	12 ³ / ₁₆	(309.56)	4 ¹ / ₈	(104.78)	5000	(22.24)	14.43	(6.55)
658	14	(350)	20	24	24	12 ⁷ / ₈	(327.03)	--	--	11 ⁵ / ₁₆	(287.34)	12 ⁵ / ₈	(320.68)	4	(101.60)	5000	(22.24)	14.43	(6.55)
658	16	(400)	24	24	24	14 ¹ / ₈	(358.78)	--	--	12 ³ / ₁₆	(309.56)	13 ⁵ / ₈	(346.08)	4	(101.60)	7200	(32.03)	15.79	(7.16)
658	18	(450)	24	--	24	15 ¹ / ₄	(387.35)	--	--	13 ⁵ / ₁₆	(338.14)	14 ³ / ₄	(374.65)	4	(101.60)	7200	(32.03)	15.79	(7.16)
658	20	(500)	30	--	30	17	(431.80)	--	--	14 ¹ / ₈	(358.78)	15 ⁷ / ₈	(403.23)	4	(101.60)	7200	(32.03)	16.90	(7.67)
658	24	(600)	30	--	30	19 ¹ / ₄	(488.95)	--	--	16 ⁷ / ₁₆	(417.51)	19 ¹ / ₄	(488.95)	4	(101.60)	7200	(32.03)	17.78	(8.06)
658	30	(750)	--	--	36-42	--	--	--	--	19 ³ / ₁₆	(487.36)	20 ¹⁵ / ₁₆	(531.81)	4	(101.60)	7200	(32.03)	20.08	(9.11)
658	36	(900)	--	--	36-42	--	--	--	--	22 ³ / ₁₆	(563.56)	24	(609.60)	4	(101.60)	7200	(32.03)	22.16	(10.05)

Maximum recommended loads are applicable only when the saddle is used on a flat bearing surface and tack welded to the pipe. When a saddle is used with a pipe roll, the maximum load given for the pipe roll applies to the saddle.

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

PIPE ALIGNMENT GUIDES

FIG. 670 - 678

PIPE ALIGNMENT GUIDES

Function: Designed for use with insulated or non-insulated pipe lines to direct the axial expansion and contraction of the pipe. The use of two or more guides on both sides of the expansion joint is recommended to avoid a pivoting effect. The first pipe guide should be placed a maximum of 4 pipe diameters from an expansion joint. Pipe guides are not designed to support any of the piping system's weight therefore additional supports are required. The maximum operating temperature should not exceed 750°F (399° C).

Material: Carbon steel

Finish: Painted

Install: The use of non-insulated guides with expansion joints shall be controlled by the recommendation of the expansion joint manufacturer (or in accordance with the Expansion Joint Manufacturers Association (EJMA) guidelines).

Ordering: Specify figure number and pipe size.

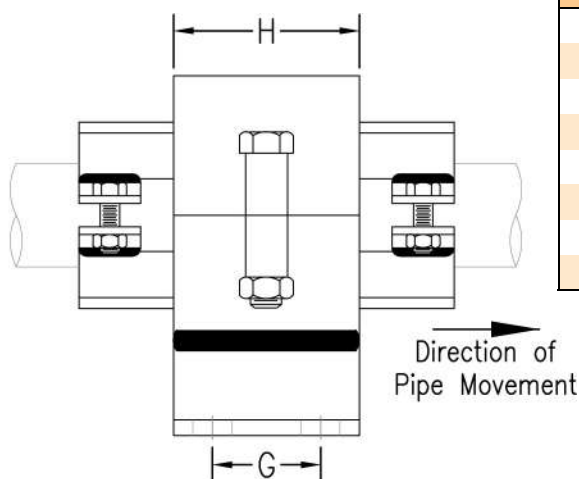
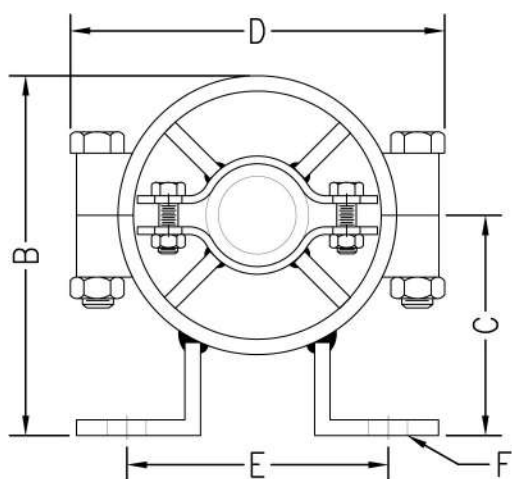


Fig. Number	Insulation Thickness	
670	0	(0)
671	1	(25.4)
673	1½	(38.1)
674	2	(50.8)
675	2½	(63.5)
676	3	(76.2)
677	3½	(88.9)
678	4	(101.6)

Body No.	B		C		D		E		F		G		H		Axial Movement		Wt. Each	
																	lbs.	kg
4	5⅞	(149.23)	3½	(88.90)	6⅞	(155.58)	4⅞	(104.78)	5⅞	(15.88)	1¾	(44.45)	3	(76.20)	3	(76.20)	6	(2.72)
5	6¾	(171.45)	4	(101.60)	7⅞	(180.98)	4¾	(111.13)	5⅞	(15.88)	1¾	(44.45)	3	(76.20)	3	(76.20)	8	(3.63)
6	7⅞	(193.68)	4¾	(111.13)	8⅞	(206.38)	5⅞	(130.18)	5⅞	(15.88)	1¾	(44.45)	3	(76.20)	3	(76.20)	10	(4.54)
8	9¼	(234.95)	5¼	(133.35)	10⅞	(257.18)	6⅞	(155.58)	5⅞	(15.88)	1¾	(44.45)	3	(76.20)	3	(76.20)	13	(5.90)
10	11⅞	(295.28)	6¼	(158.75)	12⅞	(307.98)	7	(177.80)	5⅞	(15.88)	2¾	(69.85)	4	(101.60)	4	(101.60)	20	(9.07)
12	13¾	(339.73)	7	(177.80)	14⅞	(358.78)	8¼	(209.55)	5⅞	(15.88)	2¾	(69.85)	4	(101.60)	4	(101.60)	25	(11.34)
14	15⅞	(384.18)	7⅞	(200.03)	16⅞	(409.58)	9⅞	(250.83)	¾	(19.05)	4	(101.60)	6	(152.40)	6	(152.40)	40	(18.14)
16	17	(431.80)	8⅞	(225.43)	18⅞	(460.38)	10⅞	(276.23)	¾	(19.05)	4	(101.60)	6	(152.40)	6	(152.40)	45	(20.41)
18	18¾	(476.25)	9¾	(247.65)	20⅞	(511.18)	11⅞	(301.63)	¾	(19.05)	4	(101.60)	6	(152.40)	6	(152.40)	55	(24.95)
20	21	(533.40)	10⅞	(276.23)	22⅞	(561.98)	11¾	(298.45)	¾	(19.05)	6	(152.40)	8	(203.20)	6	(152.40)	65	(29.48)
22	23⅞	(587.38)	12⅞	(307.98)	24⅞	(612.78)	14½	(368.30)	7⅞	(22.23)	6	(152.40)	8	(203.20)	6	(152.40)	95	(43.09)
24	25	(635.00)	13	(330.20)	26⅞	(663.58)	15½	(393.70)	7⅞	(22.23)	6	(152.40)	8	(203.20)	6	(152.40)	115	(52.16)
26	27¾	(704.85)	14¾	(374.65)	28⅞	(714.38)	17⅞	(434.98)	1⅞	(28.58)	6	(152.40)	8	(203.20)	6	(152.40)	135	(61.23)
30	31½	(800.10)	16½	(419.10)	32⅞	(815.98)	19¼	(488.95)	1⅞	(28.58)	6	(152.40)	8	(203.20)	6	(152.40)	150	(68.04)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

PIPE GUIDE CHARTS



PIPE GUIDE SELECTION CHART

FIG. 670 - 678

Pipe Size		Body No.							
		Insulation Thickness							
		Fig. 670 None	Fig. 671 1 (25.4)	Fig. 673 1½ (38.1)	Fig. 674 2 (50.8)	Fig. 675 2½ (63.5)	Fig. 676 3 (76.2)	Fig. 677 3½ (88.9)	Fig. 678 4 (101.6)
½	(15)	4	4	4	5	6	8	8	10
¾	(20)	4	4	5	6	8	8	10	10
1	(25)	4	4	5	6	8	8	10	20
1¼	(32)	4	4	5	6	8	8	10	10
1½	(40)	5	5	5	6	8	8	10	10
2	(50)	5	5	6	8	8	10	10	12
2½	(65)	6	6	6	8	8	10	10	12
3	(80)	6	6	8	8	10	10	12	12
4	(100)	8	8	8	10	10	12	12	14
5	(125)	10	10	10	10	12	12	16	16
6	(150)	10	10	10	12	12	14	16	16
8	(200)	12	12	12	14	16	16	18	18
10	(250)	16	16	16	16	18	18	20	20
12	(300)	18	18	18	18	20	20	22	22
14	(350)	20	20	20	20	20	22	22	24
16	(400)	22	22	22	22	22	24	24	26
18	(450)	24	24	24	24	24	26	26	30
20	(500)	26	26	26	26	26	30	30	30
24	(600)	30	30	30	30	30	--	--	--

Use selection chart to determine body number for dimensional purposes.

PIPE GUIDE SPACING CHART

FIG. 670 - 678

Pipe Size		Max. Distance Between Intermediate Guides for Pressure (psig)																			
		50		100		150		200		250		300		350		400		500		600	
		ft.	m	ft.	m	ft.	m	ft.	m	ft.	m	ft.	m	ft.	m	ft.	m	ft.	m	ft.	m
3	(80)	38	(11.58)	27	(8.23)	22	(6.71)	20	(6.10)	18	(5.49)	17	(5.18)	15	(4.57)	14	(4.27)	13	(3.96)	12	(3.66)
4	(100)	52	(15.85)	37	(11.28)	32	(9.75)	27	(8.23)	25	(7.62)	23	(7.01)	22	(6.71)	19	(5.79)	17	(5.18)	16	(4.88)
6	(150)	66	(20.12)	47	(14.33)	40	(12.19)	35	(10.67)	31	(9.45)	28	(8.53)	27	(8.23)	25	(7.62)	23	(7.01)	20	(6.10)
8	(200)	85	(25.91)	62	(18.90)	51	(15.54)	45	(13.72)	40	(12.19)	36	(10.97)	35	(10.67)	32	(9.75)	29	(8.84)	27	(8.23)
10	(250)	103	(31.39)	75	(22.86)	62	(18.90)	54	(16.46)	50	(15.24)	45	(13.72)	42	(12.80)	40	(12.19)	35	(10.67)	32	(9.75)
12	(300)	118	(35.97)	85	(25.91)	70	(21.34)	60	(18.29)	55	(16.76)	50	(15.24)	46	(14.02)	43	(13.11)	40	(12.19)	35	(10.67)
14	(350)	120	(36.58)	87	(26.52)	72	(21.95)	62	(18.90)	57	(17.37)	52	(15.85)	48	(14.63)	45	(13.72)	41	(12.50)	37	(11.28)
16	(400)	130	(39.62)	95	(28.96)	78	(23.77)	68	(20.73)	61	(18.59)	57	(17.37)	52	(15.85)	49	(14.94)	45	(13.72)	41	(12.50)
18	(450)	145	(44.20)	105	(32.00)	87	(26.52)	75	(22.86)	68	(20.73)	62	(18.90)	58	(17.68)	55	(16.76)	50	(15.24)	45	(13.72)
20	(500)	155	(47.24)	110	(33.53)	92	(28.04)	90	(27.43)	73	(22.25)	68	(20.73)	62	(18.90)	58	(17.68)	53	(16.15)	49	(14.94)
24	(600)	180	(54.86)	128	(39.01)	105	(32.00)	90	(27.43)	83	(25.30)	75	(22.86)	70	(21.34)	65	(19.81)	60	(18.29)	54	(16.46)

Note: The first pipe guide should be placed a maximum of 4 pipe diameters from an expansion joint.

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

PIPE SLIDE ASSEMBLY

FIG. 690

PIPE SLIDE ASSEMBLY

Function: Designed to be welded directly to the pipe to allow for support from below and allow for horizontal movement with a low coefficient of friction. The assembly consists of a carbon steel tee with a polished stainless bottom which rests on a PTFE (glass filled teflon) plate, bonded to a carbon steel plate. The base plate configuration will vary with the Type selected.

Material: Carbon Steel, Stainless Steel, PTFE.

Finish: Plain, Painted, or Hot dipped galvanized.

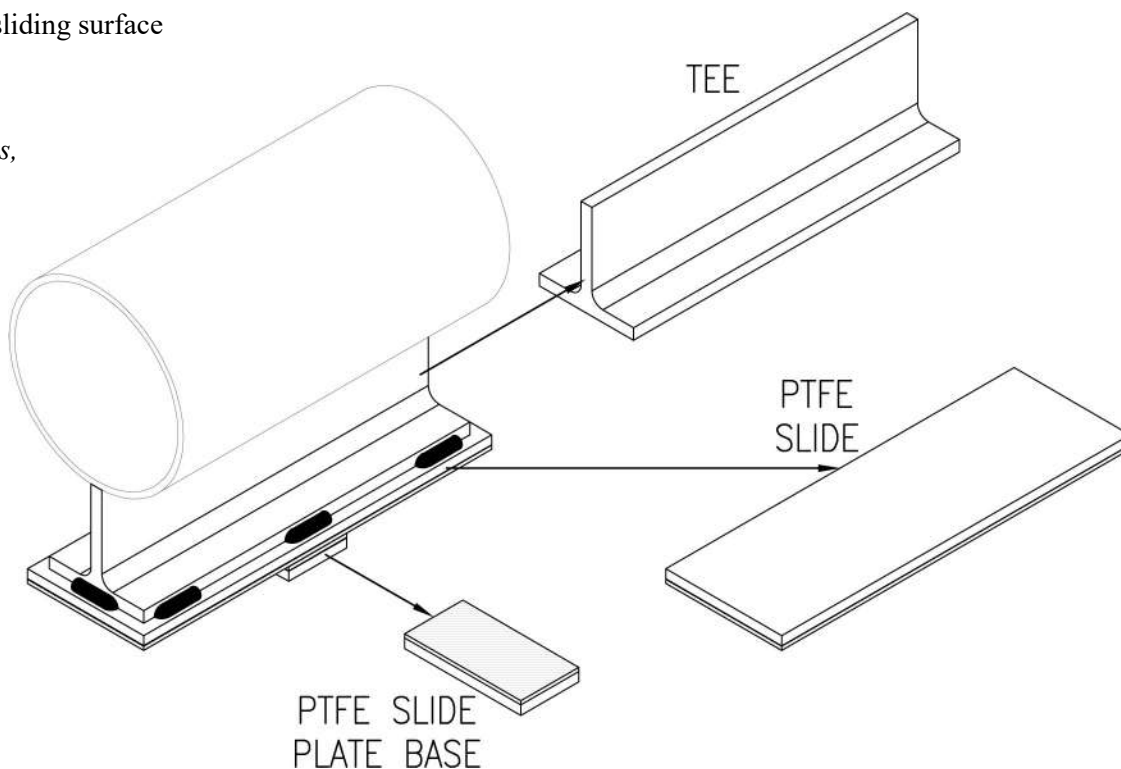
Approvals: Complies with Federal Specifications A-A-1192A (Type 35) and Manufacturers' Standardization Society ANSI/SP-58 (Type 35).

Ordering: Specify figure number, pipe size, type, finish, and travel.

Maximum Temperature:

200°F (93°C) at the sliding surface

NOTE: Greater height dimensions, longer transverse and longitudinal movements, and other customer requirements can be supplied upon request.



Pipe Size		Travel		H				K Type 2 & 3		L		W		X Type 2 & 3		Weight Each Type 1		Max Load	
				Type 1		Type 2 & 3										lbs.	kg	lbs.	kN
Up to 8"	(Up to 200)	5	(127)	3¾	(95.25)	4¼	(107.95)	4	(101.6)	8½	(215.9)	3½	(88.9)	6	(152.4)	7	(3.18)	7000	(31.14)
		10	(254)							13½	(342.9)					10	(4.54)		
		15	(381)							18½	(469.9)					13	(5.90)		
		20	(508)							23½	(596.9)					17	(7.71)		
10" - 24"	(250 - 600)	5	(127)	3¾	(95.25)	4¼	(107.95)	6	(152.4)	10½	(266.7)	4½	(114.3)	7	(177.8)	11	(4.99)	13500	(60.05)
		10	(254)							15½	(393.7)					15	(6.80)		
		15	(381)							20½	(520.7)					19	(8.62)		
		20	(508)							25½	(647.7)					23	(10.43)		

Loads based upon 500 psi / 35.2 Kg per sq. cm. pressure on the PTFE

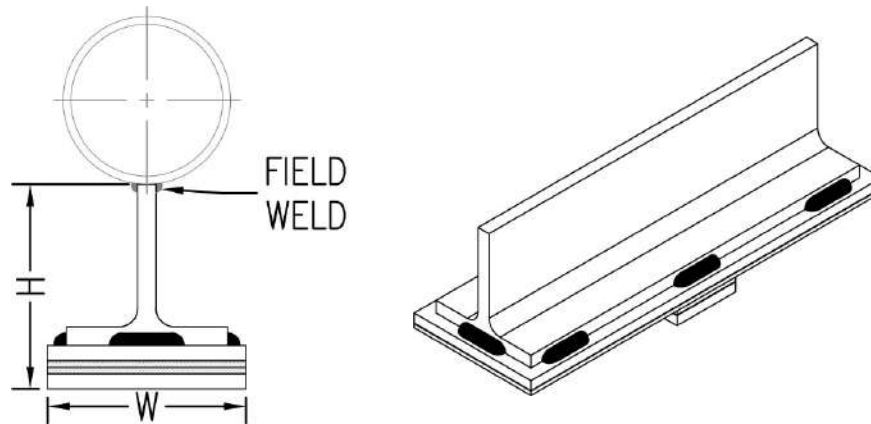
PIPE SLIDE ASSEMBLY



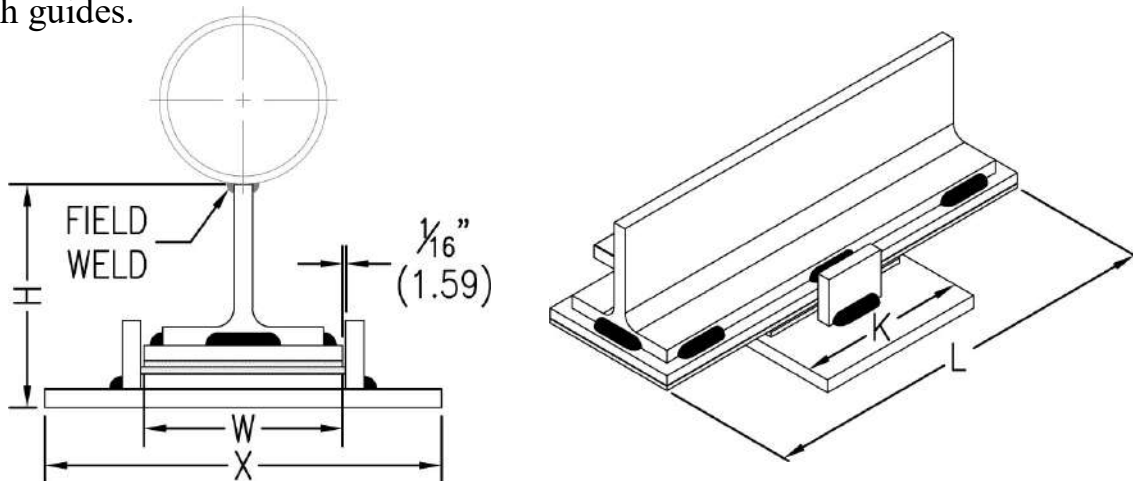
PIPE SLIDE ASSEMBLY

FIG. 690

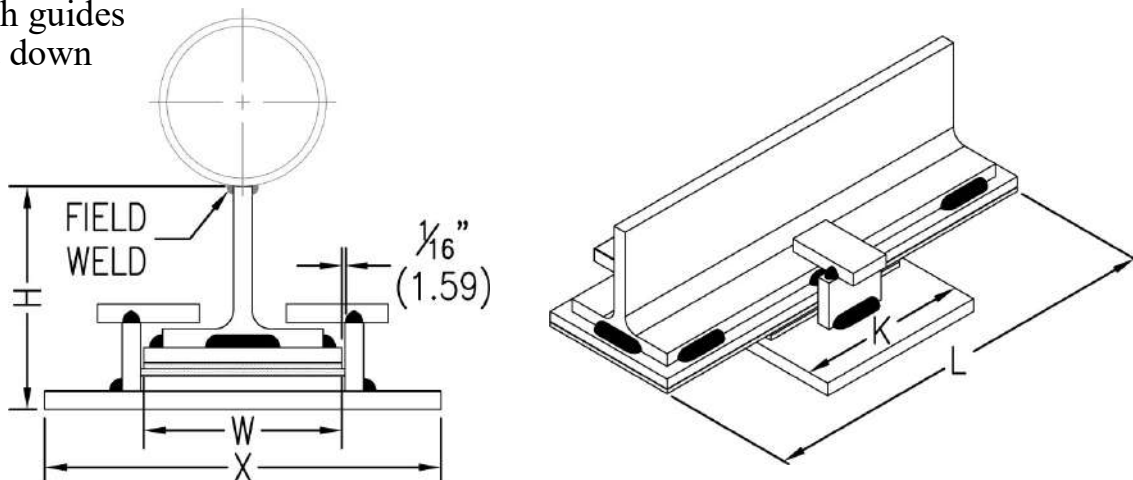
Type 1



Type 2 Base with guides.



Type 3 Base with guides and hold down lugs.



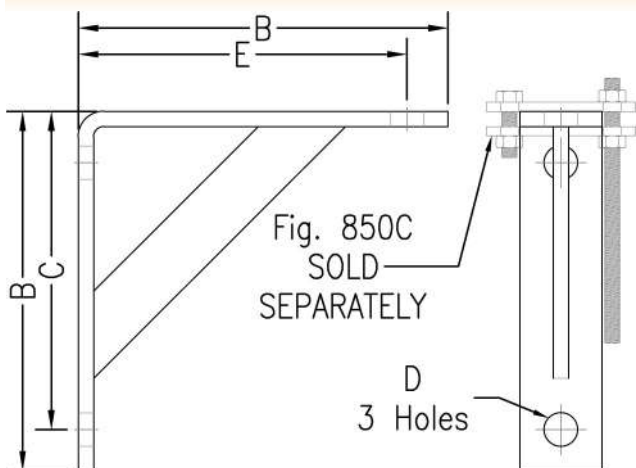
Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

THREADED ACCESSORIES
CPVC STRAPS
BAND HANGERS
BEAM CLAMPS
CLEVIS HANGERS
PIPE ROLLER SUPPORTS
SPLIT RING HANGERS
PIPE CLAMPS
CENTER LOAD BEAM CLAMPS
PIPE SHIELDS, INSULATION, & SADDLES
PIPE GUIDES & SLIDES
WALL BRACKETS
PIPE SUPPORTS
STRUCTURAL ATTACHMENTS
SEISMIC BRACING

WALL BRACKETS

FIG. 850

LIGHT DUTY WALL BRACKET

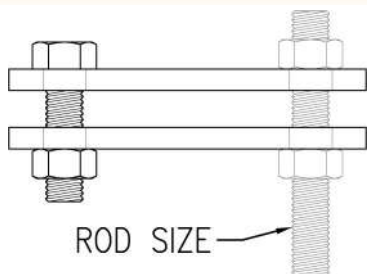


- Function:** Designed to suspend hanger rod for support of light loads under 750 lbs. Normally used in conjunction with Fig. 850C wall bracket clip.
- Material:** Carbon steel (Type 304 or 316 Stainless Steel upon request)
- Finish:** Plain or electro-galvanized (Hot dipped galvanized upon request)
- Approvals:** Complies with Federal Specification A-A-1192A (Type 31) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 31) which supersedes ANSI/MSS SP-69.
- Ordering:** Specify figure number, type number, material, and finish.

Type Number	B		C		Hole Size D		E		Max. Rec. Load		Wt. Each	
									lbs.	kN	lbs.	kg
1	9	(228.6)	6½	(165.1)	13/16	(20.64)	8	(203.2)	750	(3.34)	6.00	(2.72)
2	13	(330.2)	10½	(266.7)	13/16	(20.64)	12	(304.8)	750	(3.34)	8.70	(3.95)
3	19	(482.6)	16½	(419.1)	13/16	(20.64)	18	(457.2)	750	(3.34)	10.60	(4.81)

FIG. 850C

WALL BRACKET CLIP (For Fig. 850)



- Function:** Designed for use in conjunction with Fig. 850 wall bracket, to allow the rod to be suspended at any point along the length of the bracket.
- Material:** Carbon steel (Type 304 or 316 Stainless Steel upon request)
- Finish:** Plain or electro-galvanized (Hot dipped galvanized with electro-galvanized hardware upon request)
- Ordering:** Specify figure number, rod size, material, and finish.

Rod Size	For Pipe Sizes		Wt. Each	
			lbs.	kg
3/8	1½ to 2	(15 to 50)	.73	(.33)
1/2	2½ to 3½	(65 to 90)	1.44	(.65)

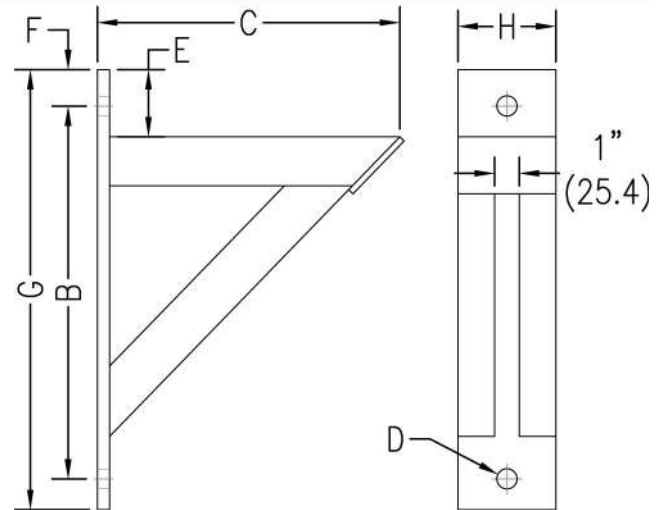
WALL BRACKETS



MEDIUM DUTY WALL BRACKET

FIG. 855

- Function:** Designed for the support or suspension of loads up to 1500 lbs. (6.67kN). from walls or structures. The 1" (25.4) space between the angles allows the rod to be placed anywhere along the length of the brackets.
- Material:** Carbon steel (Type 304 or 316 Stainless Steel upon request)
- Finish:** Plain or electro-galvanized (Hot dipped galvanized upon request)
- Approvals:** Complies with Federal Specification A-A-1192A (Type 32) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 32) which supersedes ANSI/MSS SP-69.
- Ordering:** Specify figure number, type number, material, and finish.

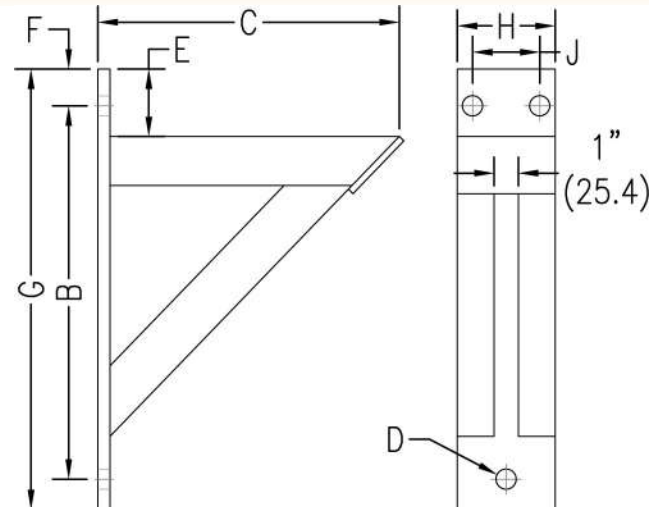


Type Number	B		C		Hole Size D		E		F		G		H		Max. Rec. Load		Wt. Each	
															lbs.	kN	lbs.	kg
0	15 1/2	(393.7)	12	(304.8)	13/16	(20.64)	2 1/2	(63.5)	1 1/4	(31.75)	18	(457.2)	4	(101.6)	1500	(6.67)	17.4	(7.89)
1	21 1/2	(546.1)	18	(457.2)	13/16	(20.64)	2 1/2	(63.5)	1 1/4	(31.75)	24	(609.6)	4 1/2	(114.3)	1500	(6.67)	27.3	(12.38)
2	27 1/2	(698.5)	24	(609.6)	13/16	(20.64)	2 1/2	(63.5)	1 1/4	(31.75)	30	(762.0)	5	(127.0)	1500	(6.67)	47.6	(21.59)

HEAVY DUTY WALL BRACKET

FIG. 860

- Function:** Designed for the support or suspension of loads up to 3000 lbs. (13.34kN). from walls or structures. The 1" (25.4) space between the angles allows the rod to be placed anywhere along the length of the brackets.
- Material:** Carbon steel (Type 304 or 316 Stainless Steel upon request)
- Finish:** Plain or electro-galvanized (Hot dipped galvanized upon request)
- Approvals:** Complies with Federal Specification A-A-1192A (Type 33) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 33) which supersedes ANSI/MSS SP-69.
- Ordering:** Specify figure number, type number, material, and finish.



Type Number	B		C		Hole Size D		E		F		G		H		J		Max. Rec. Load		Wt. Each	
																	lbs.	kN	lbs.	kg
0	15 1/4	(387.35)	12	(304.80)	13/16	(20.64)	2 3/4	(69.85)	1 1/2	(38.10)	18	(457.2)	4	(101.6)	*	*	3000	(13.34)	24.33	(11.04)
1	21 3/8	(542.93)	18	(457.20)	15/16	(23.81)	2 3/4	(69.85)	1 3/8	(34.93)	24	(609.6)	5	(127.0)	2 3/4	(69.85)	3000	(13.34)	51.80	(23.50)
2	27 1/2	(698.50)	24	(609.60)	1 1/16	(26.99)	2 3/4	(69.85)	1 1/4	(31.75)	30	(762.0)	5	(127.0)	2 1/2	(63.50)	3000	(13.34)	65.84	(29.86)
3	33 1/4	(844.55)	30	(762.00)	1 1/16	(26.99)	3	(76.20)	1 1/2	(38.10)	36	(914.4)	5	(127.0)	2 1/2	(63.50)	3000	(13.34)	82.10	(37.24)
4	39	(990.60)	36	(914.40)	1 1/16	(26.99)	3	(76.20)	1 1/2	(38.10)	42	(1066.8)	6	(152.4)	3 1/2	(88.90)	3000	(13.34)	140.52	(63.74)
5	46	(1168.40)	42	(1066.80)	1 1/16	(26.99)	3 1/2	(88.90)	2	(50.80)	50	(1270.0)	6	(152.4)	3 1/2	(88.90)	3000	(13.34)	166.40	(75.48)

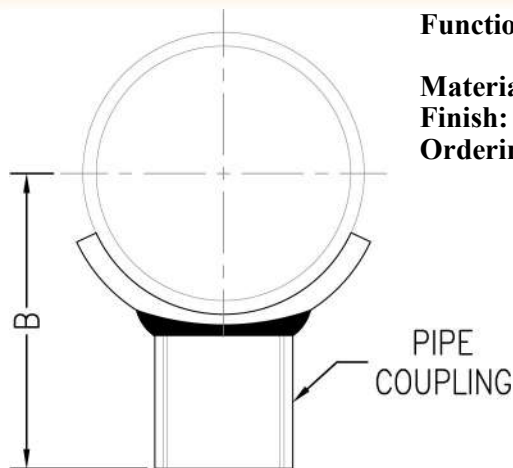
* One hole

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

PIPE SUPPORTS

FIG. 870

PIPE SADDLE SUPPORT WITH COUPLING



Function: Designed to support horizontal pipe from floor stanchions. Normally used in conjunction with Fig. 871 threaded base stand.

Material: Carbon steel (Type 304 or 316 Stainless Steel upon request)

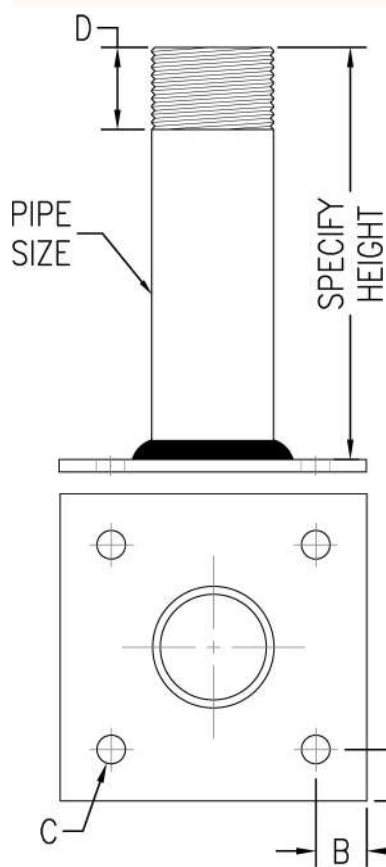
Finish: Plain or electro-galvanized

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

Pipe Size		Coupling Pipe Size		B		Wt. Each	
						lbs.	kg
1½	(40)	1¼	3¼	(82.55)		.85	(.39)
2	(50)	1¼	3⅝	(92.08)		1.12	(.51)
2½	(65)	1½	3⅞	(98.43)		1.62	(.73)
3	(80)	1½	4⅜	(106.36)		1.79	(.81)
3½	(90)	1½	4⅞	(112.71)		1.94	(.88)
4	(100)	2	4¾	(120.65)		2.73	(1.24)
5	(125)	2	5⅝	(134.94)		3.09	(1.40)
6	(150)	2½	6⅝	(176.21)		5.86	(2.66)
8	(200)	2½	7⅝	(201.61)		6.88	(3.12)
10	(250)	3	9⅞	(231.78)		10.11	(4.59)
12	(300)	3	10⅞	(257.18)		11.28	(5.12)

FIG. 871

THREADED BASE STAND



Function: Designed for use as a base stand for pipe supports.

Material: Carbon steel (Type 304 or 316 Stainless Steel upon request)

Finish: Plain or electro-galvanized (Hot dipped galvanized upon request)

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

NOTE: PHD Manufacturing Inc. is not responsible for the quality of the pipe threads if the product is supplied with hot dipped galvanized finish.

Pipe Size		B		Hole Size C		Thread Length D		Plate Size		Wt. Each	
										lbs.	kg
1	(25)	1	(25.40)	9/16	(14.29)	1½	(38.10)	¼ x 6 x 6	(6.35 x 152.4 x 152.4)	4.95	(2.25)
1¼	(32)	1	(25.40)	9/16	(14.29)	1½	(38.10)	¼ x 6 x 6	(6.35 x 152.4 x 152.4)	5.83	(2.64)
1½	(40)	1	(25.40)	9/16	(14.29)	1½	(38.10)	¼ x 6 x 6	(6.35 x 152.4 x 152.4)	6.49	(2.94)
2	(50)	1	(25.40)	9/16	(14.29)	1½	(38.10)	¼ x 6 x 6	(6.35 x 152.4 x 152.4)	7.85	(3.56)
2½	(65)	1¼	(31.75)	9/16	(14.29)	1½	(38.10)	⅜ x 8 x 8	(9.53 x 203.2 x 203.2)	15.24	(6.91)
3	(80)	1½	(38.10)	13/16	(20.64)	1½	(38.10)	⅜ x 12 x 12	(9.53 x 304.8 x 304.8)	26.24	(11.90)
4	(100)	1½	(38.10)	15/16	(23.81)	2	(50.80)	½ x 12 x 12	(12.7 x 304.8 x 304.8)	35.94	(16.30)
6	(150)	1½	(38.10)	1½	(28.58)	2	(50.80)	½ x 18 x 18	(12.7 x 457.2 x 457.2)	73.46	(33.32)

PIPE SUPPORTS

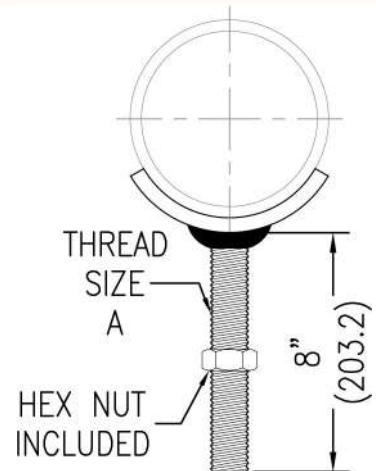


PIPE SADDLE SUPPORT WITH STUD

FIG. 874

- Function:** Designed for support of horizontal pipe from floor stand where vertical adjustment is required. Shank will fit into Schedule 40 pipe size stand 'B'.
- Material:** Carbon steel (Type 304 or 316 Stainless Steel upon request)
- Finish:** Plain or electro-galvanized
- Approvals:** Complies with Federal Specification A-A-1192A (Type 38) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 38) which supersedes ANSI/MSS SP-69.
- Ordering:** Specify figure number, pipe size, material, and finish.

Pipe Size		Thread Size A	Max. O.D. of Pipe		Sch. 40 Pipe Size B		Wt. Each	
							lbs.	kg
2	(50)	7/8	2 3/8	(60.33)	1	(25)	1.67	(.76)
2 1/2	(65)	7/8	2 7/8	(73.03)	1	(25)	1.71	(.78)
3	(80)	7/8	3 1/2	(88.90)	1	(25)	1.76	(.80)
3 1/2	(90)	1	4	(101.60)	1	(25)	3.45	(1.56)
4	(100)	1	4 1/2	(114.30)	1	(25)	3.60	(1.63)
5	(125)	1	5 9/16	(141.29)	1	(25)	3.81	(1.73)
6	(150)	1 1/4	6 5/8	(168.28)	1 1/4	(32)	5.50	(2.49)
8	(200)	1 1/4	8 5/8	(219.08)	1 1/4	(32)	7.00	(3.18)
10	(250)	1 1/2	10 3/4	(273.05)	1 1/2	(40)	7.66	(3.47)
12	(300)	1 1/2	12 3/4	(323.85)	1 1/2	(40)	8.95	(4.06)



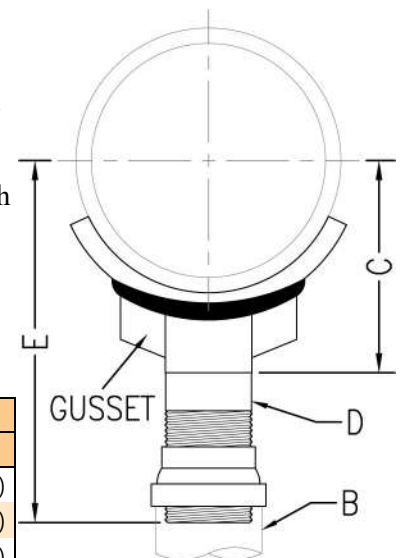
ADJUSTABLE PIPE SADDLE SUPPORT

FIG. 875

- Function:** Designed to support horizontal pipe. Normally used in conjunction with Fig. 871 threaded base stand to provide vertical adjustment of the pipe.
- Material:** Carbon steel with malleable iron reducer
- Finish:** Plain or electro-galvanized (Hot dipped galvanized with electro-galvanized threaded components upon request)
- Approvals:** Complies with Federal Specification A-A-1192A (Type 38) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 38) which supersedes ANSI/MSS SP-69.
- Ordering:** Specify figure number, pipe size, and finish.

NOTE: Gussets furnished on 8" (200) and larger.

Pipe Size		B		C		D		Adjustment E		Max. Rec. Load		Wt. Each			
								Min.		Max.		lbs.	kN	lbs.	kg
2½	(65)	2½	(63.50)	3⅛	(93.66)	1½	(38.10)	9⅞	(239.71)	13⅝	(354.01)	1800	(8.01)	5.25	(2.38)
3	(80)	2½	(63.50)	4	(101.60)	1½	(38.10)	9¾	(247.65)	14¼	(361.95)	1800	(8.01)	5.50	(2.49)
3½	(90)	2½	(63.50)	4¼	(107.95)	1½	(38.10)	10	(254.00)	14½	(368.30)	1800	(8.01)	5.50	(2.49)
4	(100)	3	(76.20)	4½	(114.30)	2½	(63.50)	10¾	(273.05)	15¼	(387.35)	3800	(16.90)	10.60	(4.81)
5	(125)	3	(76.20)	5⅛	(128.59)	2½	(63.50)	11⅝	(287.34)	15⅜	(401.64)	3800	(16.90)	10.81	(4.90)
6	(150)	3	(76.20)	5⅞	(144.46)	2½	(63.50)	11⅝	(303.21)	16⅞	(417.51)	3800	(16.90)	12.34	(5.60)
8	(200)	3	(76.20)	6⅛	(169.86)	2½	(63.50)	12⅝	(328.61)	17⅞	(442.91)	3800	(16.90)	15.00	(6.80)
10	(250)	3	(76.20)	7⅞	(200.03)	2½	(63.50)	14⅞	(358.78)	18⅝	(473.08)	3800	(16.90)	16.14	(7.32)
12	(300)	3	(76.20)	8⅞	(225.43)	2½	(63.50)	15⅞	(384.18)	19⅝	(498.48)	3800	(16.90)	17.68	(8.02)
14	(350)	4	(101.60)	11⅝	(295.28)	3	(76.20)	17⅜	(441.33)	21⅞	(555.63)	5300	(23.58)	28.18	(12.78)
16	(400)	4	(101.60)	12⅝	(320.68)	3	(76.20)	18⅜	(466.73)	22⅞	(581.03)	5300	(23.58)	30.10	(13.65)
18	(450)	6	(152.40)	14¾	(374.65)	4	(101.60)	20½	(520.70)	25	(635.00)	6700	(29.80)	49.98	(22.67)
20	(500)	6	(152.40)	15¾	(400.05)	4	(101.60)	21½	(546.10)	26	(660.40)	6700	(29.80)	52.00	(23.59)
24	(600)	6	(152.40)	18	(457.20)	4	(101.60)	23¾	(603.25)	28¼	(717.55)	7300	(32.47)	63.47	(28.79)
30	(750)	6	(152.40)	21	(533.40)	4	(101.60)	26¾	(679.45)	31¼	(793.75)	7300	(32.47)	92.24	(41.84)
36	(900)	6	(152.40)	24	(609.60)	4	(101.60)	29¾	(755.65)	34¼	(869.95)	7300	(32.47)	110.77	(50.24)

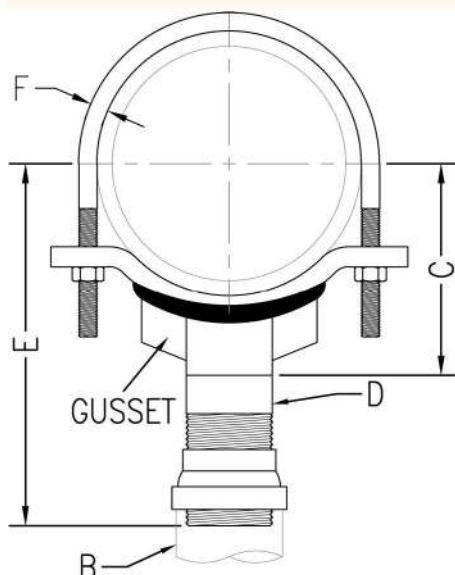


Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

PIPE SUPPORTS

FIG. 876

ADJUSTABLE PIPE SADDLE SUPPORT WITH U-BOLT



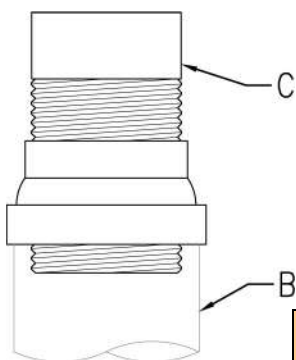
- Function:** Designed to support horizontal pipe. Normally used in conjunction with Fig. 871 threaded base stand to provide vertical adjustment of the pipe. The U-bolt is used to secure the pipe to the saddle.
- Material:** Carbon steel with malleable iron reducer
- Finish:** Plain or electro-galvanized (Hot dipped galvanized with electro-galvanized threaded components upon request)
- Approvals:** Complies with Federal Specification A-A-1192A (Type 38) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 38) which supersedes ANSI/MSS SP-69.
- Ordering:** Specify figure number, pipe size, and finish.

NOTE: Gussets furnished on 8" (200) and larger.

Pipe Size		B		C		D		Adjustment E			Dia. F		Max. Rec. Load		Wt. Each		
								Min.		Max.			lbs.	kN	lbs.	kg	
2½	(65)	2½	(63.50)	3⅛	(93.66)	1½	(38.10)	97/16	(239.71)	13⅝	(354.01)	½	(12.70)	1800	(8.01)	8.90	(4.04)
3	(80)	2½	(63.50)	4	(101.60)	1½	(38.10)	9¾	(247.65)	14¼	(361.95)	½	(12.70)	1800	(8.01)	9.05	(4.11)
3½	(90)	2½	(63.50)	4¼	(107.95)	1½	(38.10)	10	(254.00)	14½	(368.30)	½	(12.70)	1800	(8.01)	9.25	(4.20)
4	(100)	3	(76.20)	4½	(114.30)	2½	(63.50)	10¾	(273.05)	15¼	(387.35)	½	(12.70)	3800	(16.90)	13.25	(6.01)
5	(125)	3	(76.20)	5⅛	(128.59)	2½	(63.50)	11⅝	(287.34)	15⅜	(401.64)	½	(12.70)	3800	(16.90)	13.45	(6.10)
6	(150)	3	(76.20)	5⅞	(144.46)	2½	(63.50)	11⅞	(303.21)	16⅞	(417.51)	⅝	(15.88)	3800	(16.90)	16.25	(7.37)
8	(200)	3	(76.20)	6⅛	(169.86)	2½	(63.50)	12⅝	(328.61)	17⅞	(442.91)	⅝	(15.88)	3800	(16.90)	17.95	(8.14)
10	(250)	3	(76.20)	8	(203.20)	2½	(63.50)	14¼	(361.95)	18¾	(476.25)	¾	(19.05)	3800	(16.90)	22.55	(10.23)
12	(300)	3	(76.20)	9	(228.60)	2½	(63.50)	15¼	(387.35)	19¾	(501.65)	⅞	(22.23)	3800	(16.90)	26.10	(11.84)
14	(350)	4	(101.60)	11¾	(298.45)	3	(76.20)	17½	(444.50)	22	(558.80)	⅞	(22.23)	5300	(23.58)	41.65	(18.89)
16	(400)	4	(101.60)	12¾	(323.85)	3	(76.20)	18½	(469.90)	23	(584.20)	⅞	(22.23)	5300	(23.58)	44.10	(20.00)
18	(450)	6	(152.40)	15	(381.00)	4	(101.60)	20¾	(527.05)	25¼	(641.35)	1	(25.40)	6700	(29.80)	70.90	(32.16)
20	(500)	6	(152.40)	16	(406.40)	4	(101.60)	21¾	(552.45)	26¼	(666.75)	1	(25.40)	6700	(29.80)	73.75	(33.45)
24	(600)	6	(152.40)	18½	(469.90)	4	(101.60)	24¼	(615.95)	28¾	(730.25)	1	(25.40)	7300	(32.47)	91.60	(41.55)
30	(750)	6	(152.40)	21	(533.40)	4	(101.60)	26¾	(679.45)	31¼	(793.75)	1	(25.40)	7300	(32.47)	106.55	(48.33)
36	(900)	6	(152.40)	24	(609.60)	4	(101.60)	29¾	(755.65)	34¼	(869.95)	1	(25.40)	7300	(32.47)	112.50	(51.03)

FIG. 877

PIPE SUPPORT ADJUSTER



- Function:** Designed to provide up to 4 1/2" (114.3) of vertical adjustment after installation. Normally used in conjunction with Fig. 871 threaded base stand, Fig. 880 pipe saddle support or Fig. 882 pipe saddle support with U-bolt.
- Material:** Carbon steel with malleable iron reducer
- Finish:** Plain or electro-galvanized
- Approvals:** Complies with Federal Specification A-A-1192A (Type 38) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 38) which supersedes ANSI/MSS SP-69. (When used with Fig. 880 or Fig. 882)
- Ordering:** Specify figure number, pipe size, and finish.

Adjuster Size		For Pipe Size		B	C	Max. Adjustment		Wt. Each	
								lbs.	kg
1 1/2	(38.10)	2 1/2 to 3 1/2	(65 to 90)	2 1/2	1 1/2	4 1/2	(114.30)	4.05	(1.84)
2 1/2	(63.50)	4 to 12	(100 to 300)	3	2 1/2	4 1/2	(114.30)	8.30	(3.76)
3	(76.20)	14 to 16	(350 to 400)	4	3	4 1/2	(114.30)	12.60	(5.72)
4	(101.60)	18 to 36	(450 to 900)	6	4	4 1/2	(114.30)	22.60	(10.25)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

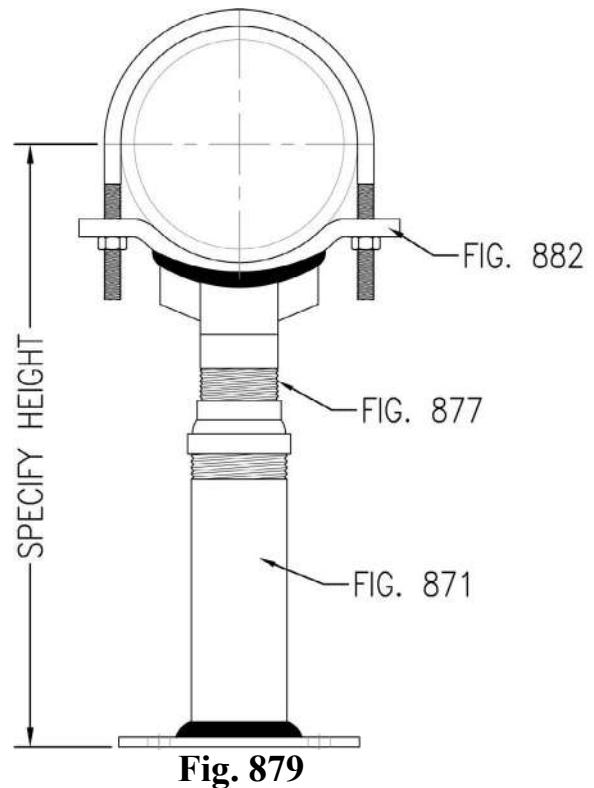
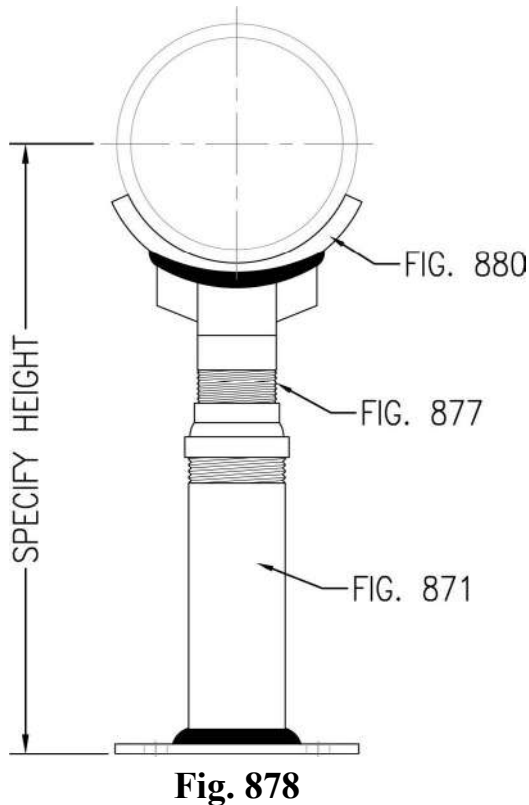
PIPE SUPPORTS



PIPE SUPPORT ADJUSTERS

FIG. 878 & 879

- Function:** Designed to provide up to 4 $\frac{1}{2}$ " (114.3) of vertical adjustment after installation.
Material: Carbon steel with malleable iron reducer
Finish: Plain or electro-galvanized
Ordering: Specify figure number, pipe size, height to center of pipe, and finish.



Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

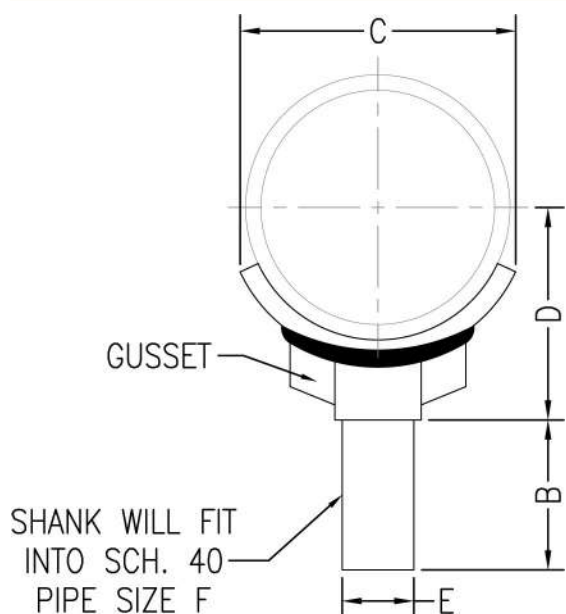
PIPE SUPPORTS

FIG. 880

PIPE SADDLE SUPPORT

- Function:** Designed to support horizontal pipe running close to the floor. Normally used in conjunction with floor stanchions.
- Material:** Carbon steel (Type 304 or 316 Stainless Steel upon request)
- Finish:** Plain or electro-galvanized (Hot dipped galvanized upon request)
- Approvals:** Complies with Federal Specification A-A-1192A (Type 36) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 36) which supersedes ANSI/MSS SP-69.
- Ordering:** Specify figure number, pipe size, material, and finish.

NOTE: Gussets furnished on 8" (200) and larger.



Pipe Size		B		C		D		E		Pipe size F		Max. Rec. Load		Wt. Each	
												lbs.	kN	lbs.	kg
2½	(65)	4	(101.6)	2½	(63.50)	3½/16	(93.66)	1½	(38.10)	1½	(40)	1800	(8.01)	1.67	(.76)
3	(80)	4	(101.6)	3½/32	(76.99)	4	(101.60)	1½	(38.10)	1½	(40)	1800	(8.01)	1.76	(.80)
3½	(90)	4	(101.6)	37/16	(87.31)	4¼	(107.95)	1½	(38.10)	1½	(40)	1800	(8.01)	1.88	(.85)
4	(100)	4	(101.6)	4¼	(107.95)	4½	(114.30)	2¾	(60.33)	2½	(65)	3800	(16.90)	3.60	(1.63)
5	(125)	4	(101.6)	4½/16	(122.24)	5¼/16	(128.59)	2¾	(60.33)	2½	(65)	3800	(16.90)	3.81	(1.73)
6	(150)	4	(101.6)	6¼/16	(153.99)	5½/16	(144.46)	2¾	(60.33)	2½	(65)	3800	(16.90)	5.50	(2.49)
8	(200)	4	(101.6)	7½/16	(201.61)	6¼/16	(169.86)	2¾	(60.33)	2½	(65)	3800	(16.90)	7.00	(3.18)
10	(250)	4	(101.6)	9¾/8	(244.48)	77/8	(200.03)	2¾	(60.33)	2½	(65)	3800	(16.90)	7.66	(3.47)
12	(300)	4	(101.6)	11¼/16	(296.86)	87/8	(225.43)	2¾	(60.33)	2½	(65)	3800	(16.90)	8.95	(4.06)
14	(350)	4	(101.6)	12¼/8	(307.98)	11¾/8	(295.28)	27/8	(73.03)	3	(80)	5300	(23.58)	16.54	(7.50)
16	(400)	4	(101.6)	137/8	(352.43)	12¾/8	(320.68)	27/8	(73.03)	3	(80)	5300	(23.58)	18.70	(8.48)
18	(450)	4	(101.6)	15¼/32	(396.08)	14¾/4	(374.65)	4	(101.60)	4	(100)	6700	(29.80)	27.98	(12.69)
20	(500)	4	(101.6)	17¾/16	(439.74)	15¾/4	(400.05)	4	(101.60)	4	(100)	6700	(29.80)	30.20	(13.70)
24	(600)	4	(101.6)	20¼/32	(527.84)	18	(457.20)	4	(101.60)	4	(100)	7300	(32.47)	41.46	(18.81)
30	(750)	4	(101.6)	26	(660.40)	21	(533.40)	4	(101.60)	4	(100)	7300	(32.47)	76.24	(34.58)
36	(900)	4	(101.6)	31¾/16	(792.16)	24	(609.60)	4	(101.60)	4	(100)	7300	(32.47)	88.77	(40.27)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

PIPE SUPPORTS

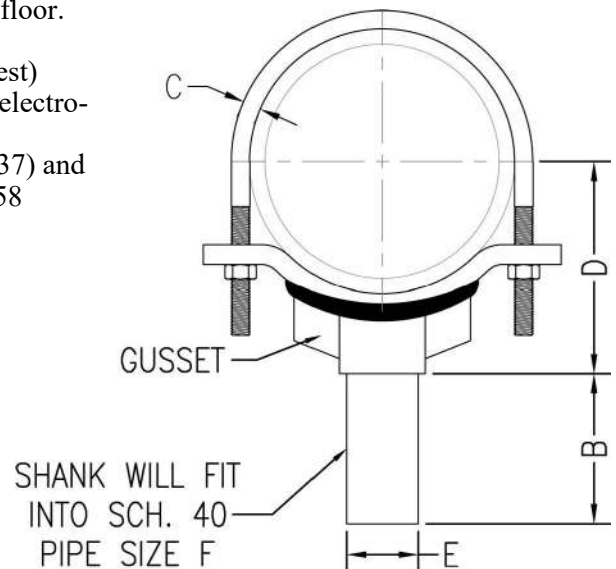


PIPE SADDLE SUPPORT WITH U-BOLT

FIG. 882

- Function:** Designed to support horizontal pipe running close to the floor. The U-bolt securely holds the pipe to the saddle.
- Material:** Carbon steel (Type 304 or 316 Stainless Steel upon request)
- Finish:** Plain or electro-galvanized (Hot dipped galvanized with electro-galvanized hardware upon request)
- Approvals:** Complies with Federal Specification A-A-1192A (Type 37) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 37) which supersedes ANSI/MSS SP-69.
- Ordering:** Specify figure number, pipe size, material, and finish.

NOTE: Gussets furnished on 8" (200) and larger.



Pipe Size		B		C		D		E		Pipe size F		Max. Rec. Load		Wt. Each	
												lbs.	kN	lbs.	kg
2½	(65)	4	(101.6)	½	(12.70)	3¼/16	(93.66)	1½	(38.10)	1½	(40)	1800	(8.01)	4.85	(2.20)
3	(80)	4	(101.6)	½	(12.70)	4	(101.60)	1½	(38.10)	1½	(40)	1800	(8.01)	5.00	(2.27)
3½	(90)	4	(101.6)	½	(12.70)	4¼	(107.95)	1½	(38.10)	1½	(40)	1800	(8.01)	5.20	(2.36)
4	(100)	4	(101.6)	½	(12.70)	4½	(114.30)	2¾/8	(60.33)	2½	(65)	3800	(16.90)	4.95	(2.25)
5	(125)	4	(101.6)	½	(12.70)	5¼/16	(128.59)	2¾/8	(60.33)	2½	(65)	3800	(16.90)	5.15	(2.34)
6	(150)	4	(101.6)	5/8	(15.88)	5¼/16	(144.46)	2¾/8	(60.33)	2½	(65)	3800	(16.90)	7.95	(3.61)
8	(200)	4	(101.6)	5/8	(15.88)	6¼/16	(169.86)	2¾/8	(60.33)	2½	(65)	3800	(16.90)	9.65	(4.38)
10	(250)	4	(101.6)	¾	(19.05)	8	(203.20)	2¾/8	(60.33)	2½	(65)	3800	(16.90)	14.25	(6.46)
12	(300)	4	(101.6)	7/8	(22.23)	9	(228.60)	2¾/8	(60.33)	2½	(65)	3800	(16.90)	17.80	(8.07)
14	(350)	4	(101.6)	7/8	(22.23)	11¾/4	(298.45)	27/8	(73.03)	3	(80)	5300	(23.58)	29.05	(13.18)
16	(400)	4	(101.6)	7/8	(22.23)	12¾/4	(323.85)	27/8	(73.03)	3	(80)	5300	(23.58)	31.50	(14.29)
18	(450)	4	(101.6)	1	(25.40)	15	(381.00)	4	(101.60)	4	(100)	6700	(29.80)	48.30	(21.91)
20	(500)	4	(101.6)	1	(25.40)	16	(406.40)	4	(101.60)	4	(100)	6700	(29.80)	53.15	(24.11)
24	(600)	4	(101.6)	1	(25.40)	18½/2	(469.90)	4	(101.60)	4	(100)	7300	(32.47)	69.00	(31.30)
30	(750)	4	(101.6)	1	(25.40)	21	(533.40)	4	(101.60)	4	(100)	7300	(32.47)	83.95	(38.08)
36	(900)	4	(101.6)	1	(25.40)	24	(609.60)	4	(101.60)	4	(100)	7300	(32.47)	96.50	(43.77)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

PIPE SUPPORTS

FIG. 883

PIPE FLANGE SUPPORT

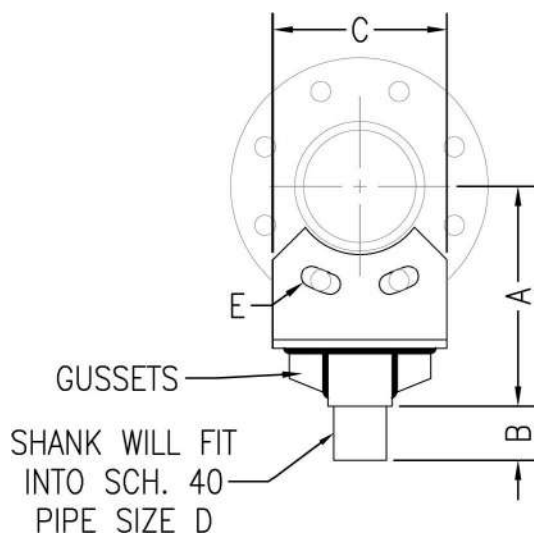
Function: Designed to support 125 lb. cast iron and 150 lb. forged steel flanged connections. (Consult factory for other flanged bolt patterns). To complete floor stanchion, use fig. 871 threaded base stand. For complete floor stanchion with vertical adjustment, use fig. 877 pipe support adjuster and fig. 871 threaded base stand.

Material: Carbon steel

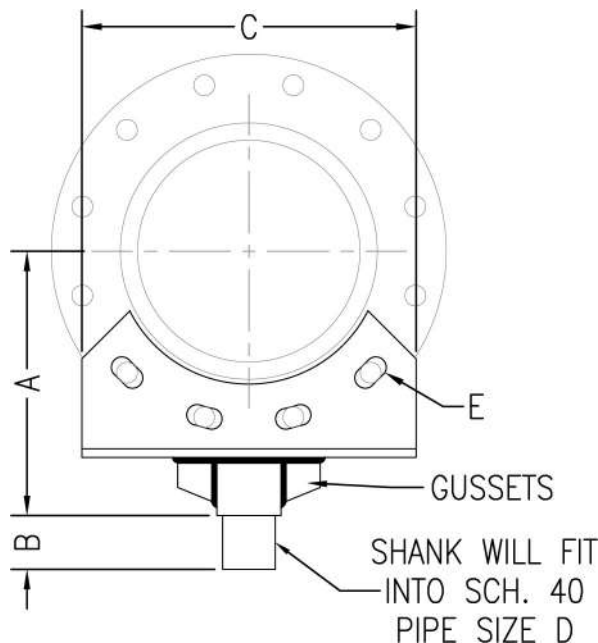
Finish: Plain or electro-galvanized

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

NOTE: Gussets furnished on 8" (200) and larger.



For pipe sizes 2" (50) through 12" (300)



For pipe sizes 14" (350) through 24" (600)

Pipe Size		A		B		C		D		E		Wt. Each	
												lbs.	kg
2	(50)	5 1/2	(139.7)	4	(101.6)	5 1/4	(133.4)	1 1/2	(40)	3/4	(19.1)	3.06	(1.4)
2 1/2	(65)	6	(152.4)	4	(101.6)	6	(152.4)	1 1/2	(40)	3/4	(19.1)	3.43	(1.6)
3	(80)	6 1/4	(158.75)	4	(101.6)	6 1/4	(158.8)	1 1/2	(40)	3/4	(19.1)	3.51	(1.6)
3 1/2	(90)	6 3/4	(171.45)	4	(101.6)	6	(152.4)	1 1/2	(40)	3/4	(19.1)	3.32	(1.5)
4	(100)	7	(177.8)	4	(101.6)	6 3/8	(161.9)	2 1/2	(65)	3/4	(19.1)	5.21	(2.4)
5	(125)	7 1/2	(190.5)	4	(101.6)	7 1/16	(179.4)	2 1/2	(65)	7/8	(22.2)	5.50	(2.5)
6	(150)	8 1/4	(209.55)	4	(101.6)	7 3/4	(196.9)	2 1/2	(65)	7/8	(22.2)	7.57	(3.4)
8	(200)	9 1/2	(241.3)	4	(101.6)	9 9/16	(242.9)	2 1/2	(65)	7/8	(22.2)	9.25	(4.2)
10	(250)	10 3/4	(273.05)	4	(101.6)	8	(203.2)	2 1/2	(65)	1	(25.4)	8.11	(3.7)
12	(300)	12 1/4	(311.15)	4	(101.6)	9 1/2	(241.3)	2 1/2	(65)	1	(25.4)	9.63	(4.4)
14	(350)	15 1/4	(387.35)	4	(101.6)	18 3/16	(462.0)	3	(80)	1 1/8	(28.6)	23.50	(10.7)
16	(400)	16 1/2	(419.1)	4	(101.6)	16 5/8	(422.3)	3	(80)	1 1/8	(28.6)	22.10	(10.0)
18	(450)	18 1/2	(469.9)	4	(101.6)	17 11/16	(449.3)	4	(100)	1 1/4	(31.8)	36.26	(16.5)
20	(500)	19 3/4	(501.65)	4	(101.6)	15 3/4	(400.1)	4	(100)	1 1/4	(31.8)	33.34	(15.1)
24	(600)	22	(558.8)	4	(101.6)	18 3/8	(466.7)	4	(100)	1 3/8	(34.9)	37.95	(17.2)

ADJUSTABLE Q-DECK INSERT

FIG. 885

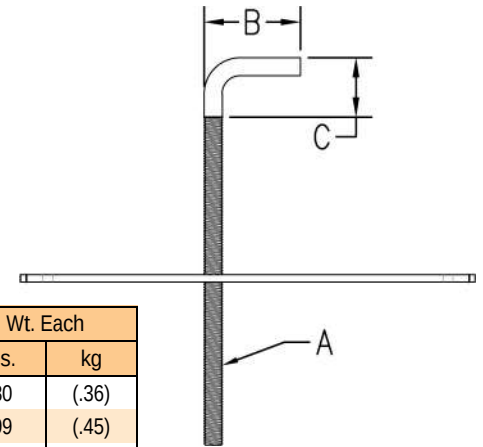
Function: Designed for installation in metal concrete deck forms to provide a means to support piping and equipment.

Material: Carbon steel

Finish: Plain or electro-galvanized

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

NOTE: 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.



Rod Size A	B		Thread Length		C		Max. Rec. Load		Wt. Each	
							lbs.	kN	lbs.	kg
3/8	1 11/16	(42.86)	7	(177.8)	1	(25.4)	730	(3.25)	.80	(.36)
1/2	1 3/4	(44.45)	7	(177.8)	1	(25.4)	1350	(6.01)	.99	(.45)
5/8	2 5/16	(58.74)	7	(177.8)	1	(25.4)	2160	(9.61)	1.29	(.59)
3/4	2 3/8	(60.33)	7	(177.8)	1	(25.4)	3230	(14.37)	2.38	(1.08)
7/8	2 3/8	(60.33)	7	(177.8)	1	(25.4)	4480	(19.93)	2.84	(1.29)
1	2 3/8	(60.33)	7	(177.8)	1	(25.4)	5900	(26.24)	2.97	(1.35)

FIG. 900 & 900-1

WELDED BEAM ATTACHMENT

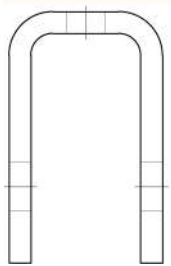


Fig. 900-1
Without Bolt
& Nut

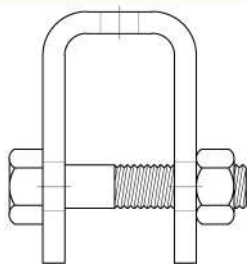


Fig. 900
With Bolt
& Nut

Function: Designed for attaching hanger rod to the bottom flange of a beam. If installed in the inverted position, the hanger rod can be vertically adjusted otherwise bolt and nut are required.

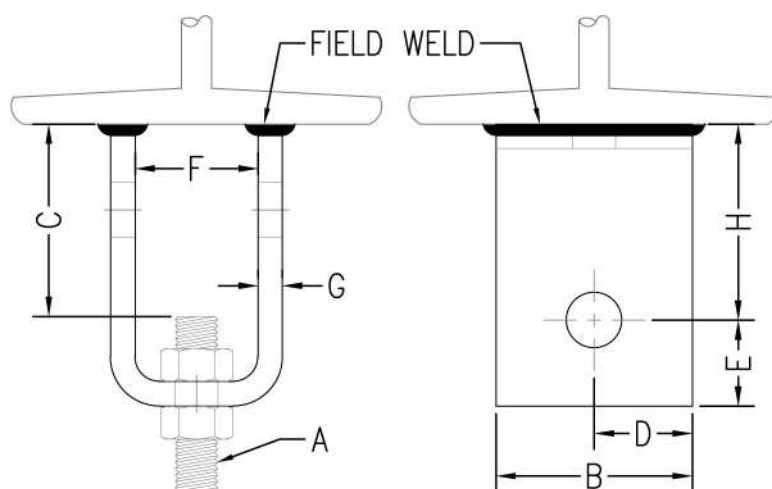
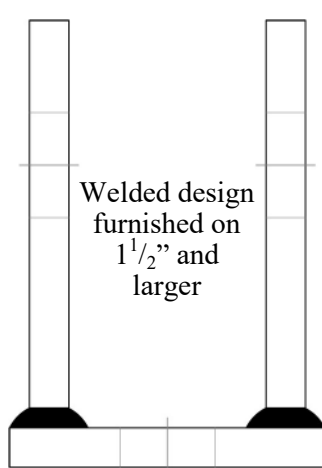
Material: Carbon steel (Type 304 or 316 Stainless Steel upon request)

Finish: Plain or electro-galvanized (Hot dipped galvanized with electro-galvanized hardware upon request)

Approvals: Complies with Federal Specification A-A-1192A (Type 22) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 22) which supersedes ANSI/MSS SP-69.

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

NOTE: The 1" size and larger are furnished with pin and cotter on Fig. 900.



Rod Size A	B		C		D		E		F		G	
3/8	2	(50.80)	1 7/8	(47.63)	1	(25.40)	7/8	(22.23)	1 1/4	(31.75)	3 ga.	--
1/2	2	(50.80)	1 3/4	(44.45)	1	(25.40)	7/8	(22.23)	1 1/4	(31.75)	3 ga.	--
5/8	2	(50.80)	1 3/4	(44.45)	1	(25.40)	7/8	(22.23)	1 1/4	(31.75)	3 ga.	--
3/4	2 1/2	(63.50)	2	(50.80)	1 1/4	(31.75)	1 1/4	(31.75)	2 1/4	(57.15)	3/8	(9.53)
7/8	2 1/2	(63.50)	3	(76.20)	1 1/4	(31.75)	1 1/4	(31.75)	2 3/8	(60.33)	3/8	(9.53)
1	3	(76.20)	3	(76.20)	1 1/2	(38.10)	1 1/2	(38.10)	2 3/4	(69.85)	1/2	(12.70)
1 1/8	3	(76.20)	3	(76.20)	1 1/2	(38.10)	1 3/4	(44.45)	3	(76.20)	1/2	(12.70)
1 1/4	4	(101.60)	3 1/2	(88.90)	2	(50.80)	2	(50.80)	3 1/2	(88.90)	5/8	(15.88)
1 1/2	5	(127.00)	4	(101.60)	2 1/2	(63.50)	2 1/2	(63.50)	3	(76.20)	3/4	(19.05)
1 3/4	5	(127.00)	5	(127.00)	2 1/2	(63.50)	2 3/4	(69.85)	3 3/4	(95.25)	3/4	(19.05)
2	6	(152.40)	5 1/4	(133.35)	3	(76.20)	3 1/4	(82.55)	3 3/4	(95.25)	3/4	(19.05)

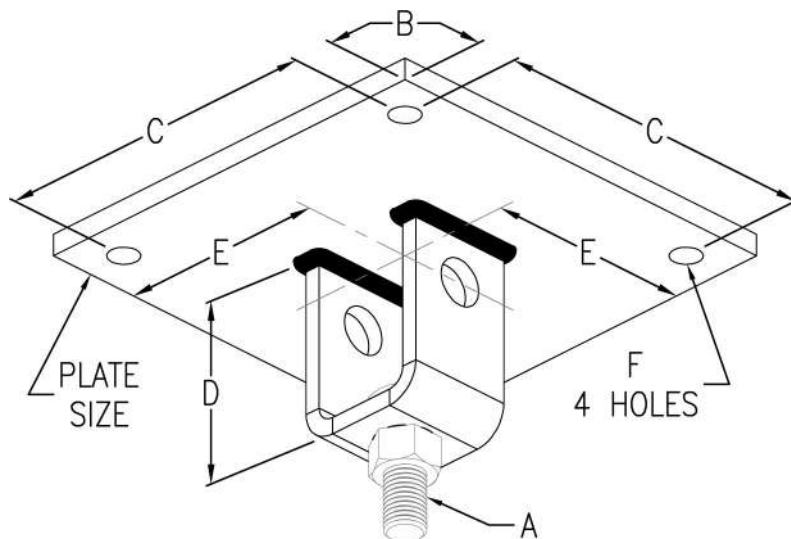
Rod Size A	H		Bolt or Pin Size	Max. Rec. Load				Wt. Each			
				650°F (343°C)		750°F (399°C)		Fig. 900-1		Fig. 900	
				lbs.	kN	lbs.	kN	lbs.	kg	lbs.	kg
3/8	2	(50.80)	1/2 x 2 1/2	730	(3.25)	572	(2.54)	.87	(.39)	1.13	(.51)
1/2	2	(50.80)	5/8 x 2 1/2	1350	(6.01)	1057	(4.70)	.85	(.39)	1.28	(.58)
5/8	2	(50.80)	3/4 x 2 1/2	2160	(9.61)	1692	(7.52)	.84	(.38)	1.50	(.68)
3/4	2	(50.80)	7/8 x 4	3230	(14.37)	2530	(11.25)	2.00	(.91)	3.04	(1.38)
7/8	3	(76.20)	1 x 4 1/2	4480	(19.93)	3508	(15.61)	2.50	(1.13)	4.02	(1.82)
1	3	(76.20)	1 1/8 x 5	5900	(26.24)	4620	(20.55)	4.14	(1.88)	6.30	(2.86)
1 1/8	3	(76.20)	1 1/4 x 5	7450	(33.14)	5834	(25.95)	4.37	(1.98)	7.15	(3.24)
1 1/4	3	(76.20)	1 3/8 x 6 1/2	9500	(42.26)	7440	(33.09)	8.50	(3.86)	12.62	(5.72)
1 1/2	4	(101.60)	1 5/8 x 6	13800	(61.39)	10807	(48.07)	16.41	(7.44)	23.23	(10.54)
1 3/4	5	(127.00)	1 7/8 x 7	18600	(82.74)	14566	(64.79)	18.70	(8.48)	24.20	(10.98)
2	5	(127.00)	2 1/4 x 7	24600	(109.43)	19265	(85.70)	22.80	(10.34)	30.60	(13.88)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

CONCRETE ROD ATTACHMENT PLATE

FIG. 903

- Function:** Designed for attaching hanger rod to a concrete ceiling.
- Material:** Carbon steel (Type 304 or 316 Stainless Steel upon request)
- Finish:** Plain or electro-galvanized (Hot dipped galvanized upon request)
- Ordering:** Specify figure number, rod size, material, and finish.

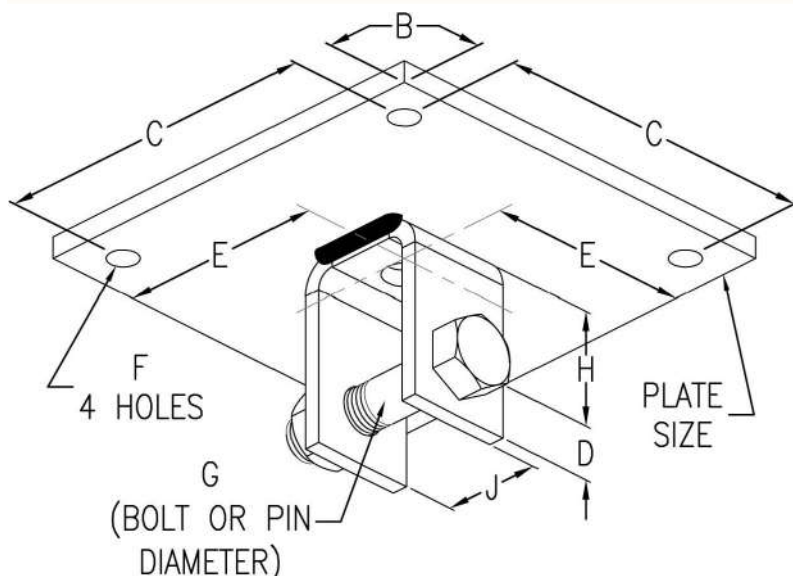


Rod Size A	B		C		D		E		F		Plate Size		Max. Rec. Load		Wt. Each	
													lbs.	kN	lbs.	kg
3/8	1	(25.40)	8	(203.20)	27/8	(73.03)	5	(127.00)	9/16	(14.29)	10 x 10 x 3/8	(254 x 254 x 9.53)	730	(3.25)	11.60	(5.26)
1/2	1	(25.40)	8	(203.20)	27/8	(73.03)	5	(127.00)	9/16	(14.29)	10 x 10 x 3/8	(254 x 254 x 9.53)	1350	(6.01)	11.60	(5.26)
5/8	1	(25.40)	8	(203.20)	27/8	(73.03)	5	(127.00)	9/16	(14.29)	10 x 10 x 3/8	(254 x 254 x 9.53)	2160	(9.61)	15.10	(6.85)
3/4	1	(25.40)	8	(203.20)	3 1/4	(82.55)	5	(127.00)	1 1/16	(17.46)	10 x 10 x 1/2	(254 x 254 x 12.7)	3230	(14.37)	16.10	(7.30)
7/8	1	(25.40)	8	(203.20)	4 1/4	(107.95)	5	(127.00)	1 1/16	(17.46)	10 x 10 x 1/2	(254 x 254 x 12.7)	4480	(19.93)	16.70	(7.57)
1	2	(50.80)	8	(203.20)	4 1/2	(114.30)	6	(152.40)	1 3/16	(20.64)	12 x 12 x 1/2	(304.8 x 304.8 x 12.7)	5900	(26.24)	34.90	(15.83)
1 1/8	2	(50.80)	8	(203.20)	4 3/4	(120.65)	6	(152.40)	1 3/16	(20.64)	12 x 12 x 1/2	(304.8 x 304.8 x 12.7)	7450	(33.14)	35.25	(15.99)
1 1/4	2	(50.80)	8	(203.20)	5	(127.00)	6	(152.40)	1 5/16	(23.81)	12 x 12 x 3/4	(304.8 x 304.8 x 19.05)	9500	(42.26)	38.70	(17.55)
1 1/2	2	(50.80)	8	(203.20)	6 1/2	(165.10)	6	(152.40)	1 1/16	(26.99)	12 x 12 x 1	(304.8 x 304.8 x 25.4)	13800	(61.39)	56.40	(25.58)
1 3/4	2	(50.80)	10	(254.00)	7 3/4	(196.85)	7	(177.80)	1 3/8	(34.93)	14 x 14 x 1 1/4	(355.6 x 355.6 x 31.75)	18600	(82.74)	88.10	(39.96)
2	2	(50.80)	10	(254.00)	8 1/4	(209.55)	7	(177.80)	1 3/8	(34.93)	14 x 14 x 1 1/4	(355.6 x 355.6 x 31.75)	24600	(109.43)	92.20	(41.82)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

FIG. 904

CONCRETE CLEVIS PLATE



Function: Designed for use as a structural attachment to a concrete ceiling. Normally used in conjunction with Fig. 35 weldless eye nut or Fig. 55 welded eye rod.

Material: Carbon steel (Type 304 or 316 Stainless Steel upon request)

Finish: Plain or electro-galvanized (Hot dipped galvanized with electro-galvanized hardware upon request)

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

NOTE: The 1" size and larger are furnished with pin and cotter. All other sizes are furnished with bolt and nut.

Rod Size A	B		C		D		E		F		G	
3/8	1	(25.40)	8	(203.20)	7/8	(22.23)	5	(127.00)	9/16	(14.29)	1/2	(12.70)
1/2	1	(25.40)	8	(203.20)	7/8	(22.23)	5	(127.00)	9/16	(14.29)	5/8	(15.88)
5/8	1	(25.40)	8	(203.20)	7/8	(22.23)	5	(127.00)	9/16	(14.29)	3/4	(19.05)
3/4	1	(25.40)	8	(203.20)	1 1/4	(31.75)	5	(127.00)	11/16	(17.46)	7/8	(22.23)
7/8	1	(25.40)	8	(203.20)	1 1/4	(31.75)	5	(127.00)	11/16	(17.46)	1	(25.40)
1	2	(50.80)	8	(203.20)	1 1/2	(38.10)	6	(152.40)	13/16	(20.64)	1 1/8	(28.58)
1 1/8	2	(50.80)	8	(203.20)	1 3/4	(44.45)	6	(152.40)	13/16	(20.64)	1 1/4	(31.75)
1 1/4	2	(50.80)	8	(203.20)	2	(50.80)	6	(152.40)	15/16	(23.81)	1 3/8	(34.93)
1 1/2	2	(50.80)	8	(203.20)	2 1/2	(63.50)	6	(152.40)	1 1/16	(26.99)	1 5/8	(41.28)
1 3/4	2	(50.80)	10	(254.00)	2 3/4	(69.85)	7	(177.80)	1 3/8	(34.93)	1 7/8	(47.63)
2	2	(50.80)	10	(254.00)	3 1/4	(82.55)	7	(177.80)	1 3/8	(34.93)	2 1/4	(57.15)

Rod Size A	H		J		Plate Size		Max. Rec. Load		Wt. Each	
							lbs.	kN	lbs.	kg
3/8	2	(50.80)	1 1/4	(31.75)	10 x 10 x 3/8	(254 x 254 x 9.53)	730	(3.25)	11.80	(5.35)
1/2	2	(50.80)	1 1/4	(31.75)	10 x 10 x 3/8	(254 x 254 x 9.53)	1350	(6.01)	11.90	(5.40)
5/8	2	(50.80)	1 1/4	(31.75)	10 x 10 x 3/8	(254 x 254 x 9.53)	2160	(9.61)	15.70	(7.12)
3/4	2	(50.80)	2 1/4	(57.15)	10 x 10 x 1/2	(254 x 254 x 12.7)	3230	(14.37)	16.90	(7.67)
7/8	3	(76.20)	2 3/8	(60.33)	10 x 10 x 1/2	(254 x 254 x 12.7)	4480	(19.93)	18.10	(8.21)
1	3	(76.20)	2 3/4	(69.85)	12 x 12 x 1/2	(304.8 x 304.8 x 12.7)	5900	(26.24)	36.90	(16.74)
1 1/8	3	(76.20)	3	(76.20)	12 x 12 x 1/2	(304.8 x 304.8 x 12.7)	7450	(33.14)	37.75	(17.12)
1 1/4	3	(76.20)	3 1/2	(88.90)	12 x 12 x 3/4	(304.8 x 304.8 x 19.05)	9500	(42.26)	40.90	(18.55)
1 1/2	4	(101.60)	3	(76.20)	12 x 12 x 1	(304.8 x 304.8 x 25.4)	13800	(61.39)	59.80	(27.12)
1 3/4	5	(127.00)	3 3/4	(95.25)	14 x 14 x 1 1/4	(355.6 x 355.6 x 31.75)	18600	(82.74)	93.60	(42.46)
2	5	(127.00)	3 3/4	(95.25)	14 x 14 x 1 1/4	(355.6 x 355.6 x 31.75)	24600	(109.43)	100.00	(45.36)

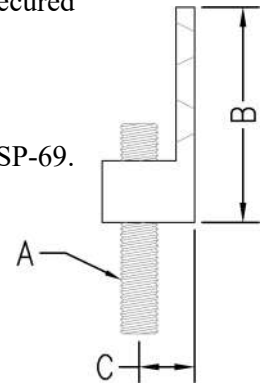
Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

SIDE BEAM CONNECTOR

FIG. 905

- Function:** Designed for attaching hanger rod to the side of wooden beams or walls. Normally secured in place with Fig. 48 wood drive screw.
- Material:** Malleable iron
- Finish:** Plain or electro-galvanized
- Approvals:** Complies with Federal Specification A-A-1192A (Type 34) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 34) which supersedes ANSI/MSS SP-69.
- Ordering:** Specify figure number, rod size, and finish.

Rod Size A	B		C		Drive Screw Size	Max. Rec. Load		Wt. Each	
						lbs.	kN	lbs.	kg
3/8	2 3/16	(55.56)	9/16	(14.29)	#12 x 1 1/2	250	(1.11)	.13	(.06)
1/2	2 3/4	(69.85)	3/4	(19.05)	#14 x 1 1/2	480	(2.14)	.25	(.11)

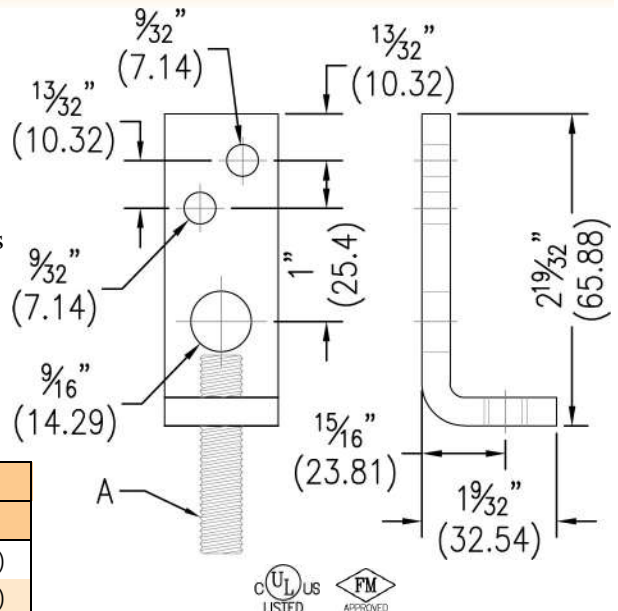


STEEL SIDE BEAM CONNECTOR

FIG. 906

- Function:** Designed for attaching hanger rod to wood structures. Secured with Fig. 45 lag screw or two Fig. 48 wood drive screws, see chart.
- Material:** Carbon steel
- Finish:** Plain or electro-galvanized (Hot dipped galvanized upon request)
- Approvals:** Underwriters' Laboratories Listed in the U.S. (UL) and Canada (CUL), and Factory Mutual Approved. Complies with Federal Specification A-A-1192A (Type 34) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 34) which supersedes ANSI/MSS SP-69.
- Ordering:** Specify figure number and finish.

Rod Size A	Max. Pipe Size		UL Listed Fasteners	Max. Rec. Load		Wt. Each	
				lbs.	kN	lbs.	kg
3/8	2	(50)	(2) #16 x 2	400	(1.78)	.21	(.10)
3/8	4	(100)	1/2 x 2 1/2	730	(3.25)	.21	(.10)



REVERSIBLE ANGLE BRACKET

FIG. 910

- Function:** Designed to support pipe at various distances from a wall or column.
- Material:** Carbon steel (Type 304 or 316 Stainless Steel upon request)
- Finish:** Plain or electro-galvanized (Hot dipped galvanized upon request)
- Ordering:** Specify figure number, size number, material, and finish.

Size No.	B		C		Hole Size D		Max. Rec. Load		Wt. Each	
							lbs.	kN	lbs.	kg
1	3	(76.20)	2	(50.80)	7/16	(11.11)	180	(0.80)	.43	(.20)
2	4	(101.60)	3	(76.20)	7/16	(11.11)	180	(0.80)	.58	(.26)
3	3	(76.20)	2	(50.80)	9/16	(14.29)	390	(1.73)	1.00	(.45)
4	4	(101.60)	3	(76.20)	9/16	(14.29)	390	(1.73)	1.25	(.57)

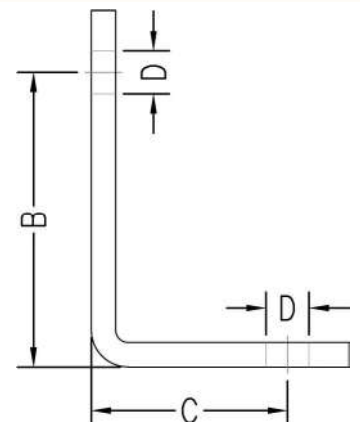
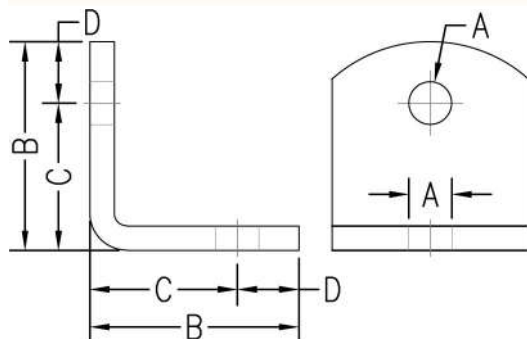


FIG. 920

SIDE BEAM ANGLE BRACKET

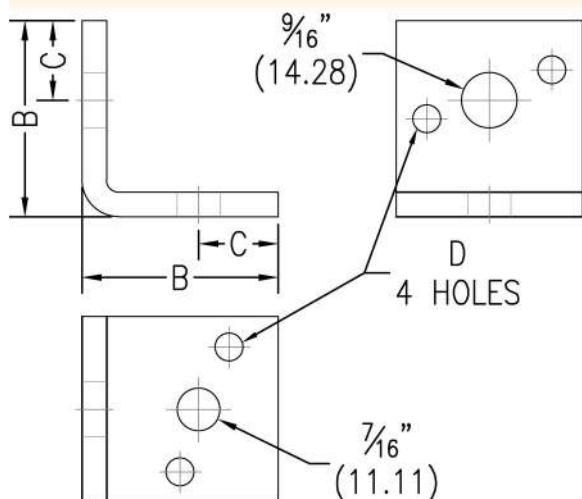


- Function:** Designed for use with wood, concrete, or steel beams to provide a means for supporting hanger rod. When used on steel beams Fig. 920 can be welded or bolted in place.
- Material:** Carbon steel (Type 304 or 316 Stainless Steel upon request)
- Finish:** Plain or electro-galvanized (Hot dipped galvanized upon request)
- Approvals:** Complies with Federal Specification A-A-1192A (Type 34) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 34) which supersedes ANSI/MSS SP-69.
- Ordering:** Specify figure number, rod size, material, and finish.

Rod Size A	For Pipe Size		B		C		D		Max. Rec. Load				Wt. Each	
									Lag Screw		Bolted to Steel			
									lbs.	kN	lbs.	kN	lbs.	kg
3/8	1/2 to 2	(15 to 50)	2 1/8	(53.98)	1 1/2	(38.10)	5/8	(15.88)	390	(1.73)	580	(2.58)	.52	(.24)
1/2	2 1/2 to 3 1/2	(65 to 90)	2 1/8	(53.98)	1 1/2	(38.10)	5/8	(15.88)	640	(2.85)	960	(4.27)	.50	(.23)
5/8	4 to 5	(100 to 125)	2 1/2	(63.50)	1 1/2	(38.10)	1	(25.40)	760	(3.38)	1500	(6.67)	.75	(.34)
3/4	6 to 8	(150 to 200)	2 1/2	(63.50)	1 1/2	(38.10)	1	(25.40)	830	(3.69)	2500	(11.12)	.73	(.33)
7/8	10 to 12	(250 to 300)	3 1/4	(82.55)	2 1/4	(57.15)	1	(25.40)	830	(3.69)	3600	(16.01)	1.38	(.63)

FIG. 925

REVERSIBLE SIDE BEAM ANGLE BRACKET



- Function:** Designed for attaching hanger rod to the side of beams or walls. Fig. 925 can accommodate either 3/8" or 1/2" rod.
- Material:** Carbon steel
- Finish:** Plain or electro-galvanized (Hot dipped galvanized upon request)
- Approvals:** Complies with Federal Specification A-A-1192A (Type 34) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 34) which supersedes ANSI/MSS SP-69.
- Ordering:** Specify figure number and finish.

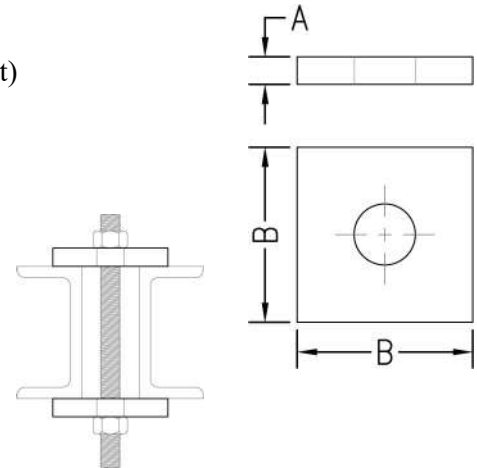
For Rod Size	B		C		D		Max. Rec. Load		Wt. Each	
							lbs.	kN	lbs.	kg
3/8 or 1/2	2	(50.80)	13/16	(20.64)	9/32	(7.14)	500	(2.22)	.50	(.23)

SQUARE PLATE WASHER

FIG. 930

Function: Designed as a heavy-duty washer to suspend hanger rods.
Material: Carbon steel (Type 304 or 316 Stainless Steel upon request)
Finish: Plain or electro-galvanized (Hot dipped galvanized upon request)
Ordering: Specify figure number, rod size, material, and finish.

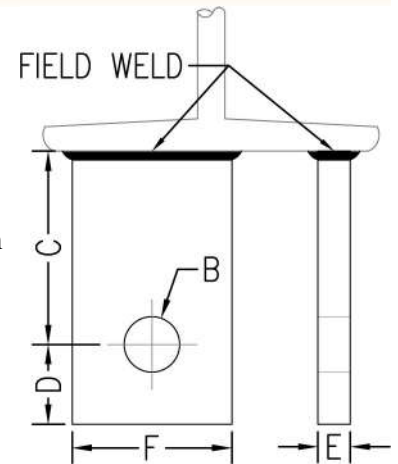
Rod Size	A		B		Wt. Each	
					lbs.	kg
3/8	1/4	(6.35)	2	(50.80)	.24	(.11)
1/2	1/4	(6.35)	2	(50.80)	.23	(.10)
5/8	1/4	(6.35)	2 1/2	(63.50)	.40	(.18)
3/4	1/4	(6.35)	2 1/2	(63.50)	.39	(.18)
7/8	3/8	(9.53)	3	(76.20)	.87	(.39)
1	3/8	(9.53)	4	(101.60)	1.60	(.73)
1 1/8	1/2	(12.70)	4	(101.60)	2.26	(1.03)
1 1/4	1/2	(12.70)	5	(127.00)	3.54	(1.61)
1 1/2	3/4	(19.05)	5	(127.00)	4.52	(2.05)
1 3/4	3/4	(19.05)	5	(127.00)	4.38	(1.99)
2	3/4	(19.05)	6	(152.40)	6.80	(3.08)



WELDING LUG

FIG. 935 & 936

Function: Designed to be welded to the underside of structural members to provide a means of supporting rod attachments. Used in conjunction with Fig. 38 forged steel clevis.
Material: Carbon steel (Type 304 or 316 Stainless Steel upon request)
Finish: Plain or electro-galvanized (Hot dipped galvanized upon request)
Approvals: Complies with Federal Specification A-A-1192A (Type 57) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 57) which supersedes ANSI/MSS SP-69.
Ordering: Specify figure number, rod size, material, and finish.

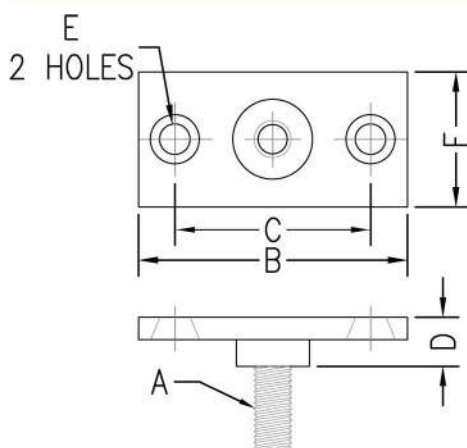


Rod Size	Pin or Bolt	Hole Size B		C				D		E		F		Max. Rec. Load				Wt. Each			
														650°F (343°C)		750°F (399°C)		Fig. 936		Fig. 935	
				Fig. 936		Fig. 935								lbs.	kN	lbs.	kN	lbs.	kg	lbs.	kg
1/2	5/8	11/16	(17.46)	1 1/2	(38.1)	3	(76.2)	1 1/4	(31.75)	1/4	(6.35)	2 1/2	(63.5)	1350	(6.01)	1057	(4.70)	.48	(.22)	.75	(.34)
5/8	3/4	13/16	(20.64)	1 1/2	(38.1)	3	(76.2)	1 1/4	(31.75)	1/4	(6.35)	2 1/2	(63.5)	2160	(9.61)	1692	(7.52)	.41	(.19)	.68	(.31)
3/4	7/8	15/16	(23.81)	1 1/2	(38.1)	3	(76.2)	1 1/4	(31.75)	3/8	(9.53)	2 1/2	(63.5)	3230	(14.37)	2530	(11.25)	.60	(.27)	1.04	(.47)
7/8	1	1 1/8	(28.58)	2	(50.8)	3	(76.2)	1 1/4	(31.75)	3/8	(9.53)	2 1/2	(63.5)	4480	(19.93)	3508	(15.61)	.71	(.32)	.98	(.44)
1	1 1/8	1 1/4	(31.75)	2	(50.8)	3	(76.2)	1 1/2	(38.10)	1/2	(12.70)	3	(76.2)	5900	(26.24)	4620	(20.55)	1.20	(.54)	1.62	(.73)
1 1/4	1 3/8	1 1/2	(38.10)	3	(76.2)	4	(101.6)	2	(50.80)	5/8	(15.88)	4	(101.6)	9500	(42.26)	7440	(33.09)	3.03	(1.37)	3.73	(1.69)
1 1/2	1 5/8	1 3/4	(44.45)	3	(76.2)	4 1/2	(114.3)	2 1/2	(63.50)	3/4	(19.05)	5	(127.0)	13800	(61.39)	10807	(48.07)	4.82	(2.19)	6.42	(2.91)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

FIG. 940, 941, & 942

CEILING FLANGE



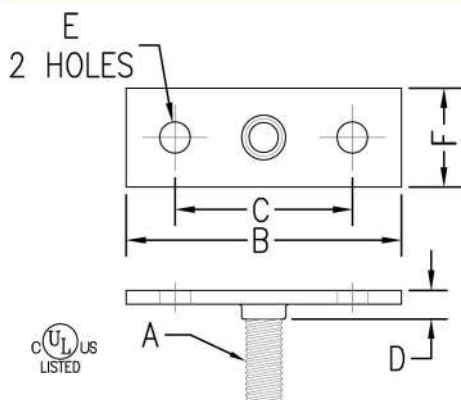
- Function:** Designed to provide a means for attaching hanger rod to wood beams or ceilings.
- Material:** Malleable iron (Type 304 or 316 Stainless Steel upon request for $\frac{3}{8}$ " only)
- Finish:** Plain (Fig. 940), electro-galvanized (Fig. 941), or copper color epoxy finish (Fig. 942)
- Ordering:** Specify figure number, rod size, material, and finish.

Rod Size A	B		C		D		E		F		Max. Rec. Load		Wt. Each	
											lbs.	kN	lbs.	kg
$\frac{3}{8}$	$2\frac{3}{4}$	(69.85)	2	(50.8)	$\frac{1}{2}$	(12.7)	$\frac{5}{16}$	(7.94)	$1\frac{3}{8}$	(34.93)	180	(0.8)	.18	(.08)
$\frac{1}{2}$	$2\frac{3}{4}$	(69.85)	2	(50.8)	$\frac{1}{2}$	(12.7)	$\frac{5}{16}$	(7.94)	$1\frac{3}{8}$	(34.93)	180	(0.8)	.18	(.08)

* $\frac{3}{8}$ " rod sizes are only available in type 304 or 316 stainless steel. For non stainless steel $\frac{3}{8}$ " rod size, see Fig. 945 (electro-galvanized) or Fig. 946 (copper finish) Steel Ceiling Plate.

FIG. 945 & 946

STEEL CEILING PLATE



- Function:** Designed to provide a means for attaching hanger rod to wood beams or ceilings. The copper finish is for product identification only and is not intended for corrosion resistance.
- Material:** Carbon steel
- Finish:** Pre-galvanized (Fig. 945) or copper finish (Fig. 946)
- Approvals:** Underwriters' Laboratories Listed in the U.S. (UL) and Canada (CUL) for supporting up to 2" (50) pipe max. (Fig. 945 only)
- Ordering:** Specify figure number.

Rod Size A	B		C		D		E		F		Max. Rec. Load		Wt. Each	
											lbs.	kN	lbs.	kg
$\frac{3}{8}$	$2\frac{13}{16}$	(71.45)	$1\frac{13}{16}$	(46.05)	$\frac{5}{16}$	(7.94)	$\frac{5}{16}$	(7.94)	1	(25.40)	180	(0.8)	.10	(.05)

CONCRETE INSERT

FIG. 950 & 951

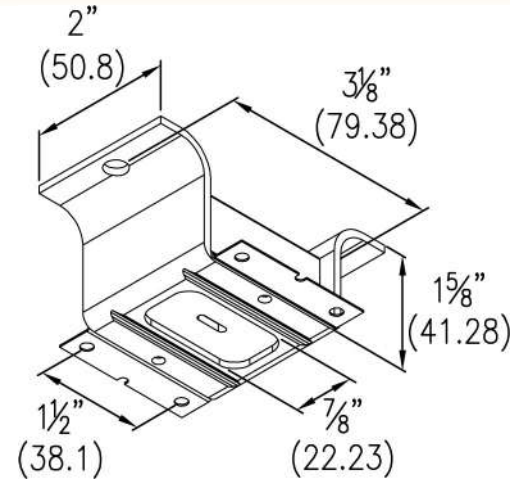
Function: Designed to be embedded in concrete to provide a means of suspending pipe from ceilings. The insert is held in place by nailing it to the forms, until the concrete is poured. The insert comes with a snap-out plug to keep the inner housing clean during pouring of the concrete. After the concrete has set, the plug is removed, exposing the inner housing. The Fig. 950N and 951N Concrete Insert Nuts can be installed and the rod fastened to the nut. The rod should touch the inside top of the insert but should not be forced to avoid damaging the insert.

Material: Carbon steel

Finish: Plain (Fig. 950) or electro-galvanized (Fig. 951)

Approvals: Complies with Federal Specification A-A-1192A (Type 18) and Manufacturers' Standardization Society ANSI/MSS SP-58 (Type 18) which supersedes ANSI/MSS SP-69.

Ordering: Specify figure number.



Rod Size	Max. Rec. Load		Wt. Each	
	lbs.	kN	lbs.	kg
1/4	240	(1.07)	.44	(.20)
3/8 - 3/4	600	(2.67)	.44	(.20)

CONCRETE INSERT NUT

FIG. 950N & 951N

Function: Designed to be used with the Fig. 950 and 951 Concrete Insert.

Material: Carbon steel

Finish: Plain (Fig. 950N) or electro-galvanized (Fig. 951N)

Ordering: Specify figure number and rod size.

Rod Size	B		Max. Rec. Load		Wt. Each	
			lbs.	kN	lbs.	kg
1/4	1/4	(6.35)	240	(1.07)	.08	(.04)
3/8	3/8	(9.53)	600	(2.67)	.10	(.05)
1/2	1/2	(12.70)	600	(2.67)	.11	(.05)
5/8	1/2	(12.70)	600	(2.67)	.14	(.06)
3/4	1/2	(12.70)	600	(2.67)	.16	(.07)

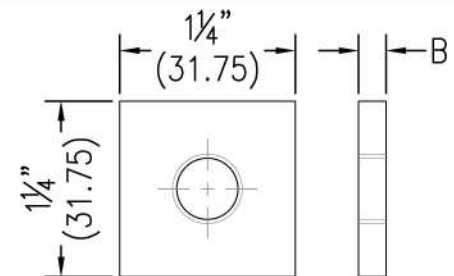


FIG. 990

ADJUSTABLE IN-RACK FLUE HANGER

- Function:** Designed to be fully adjustable to fit typical 8" (203.2), 10" (254), and 12" (304.8) flue spaces between common warehouse racking types such as teardrop.
- Size:** $\frac{3}{8}$ " rod
- Material:** Carbon steel
- Finish:** Electro-galvanized
- Install:** Loosen rod coupling so the device can expand. Place compressed product in the rack flue space. Expand device inserting the support rivets into rack columns. Once fully expanded, pull device down securing it into the rack columns ensuring spring clips snap in engaging the rack column. Adjust the rod coupling assembly to the desired position then tighten coupling 80 in.-lbs. (9.04 N-m). Then insert threaded rod until it fully engages into the rod coupling.
- Approvals:** Underwriters' Laboratories Listed in the U.S. (UL) and Canada (CUL).
- Ordering:** Specify figure number.

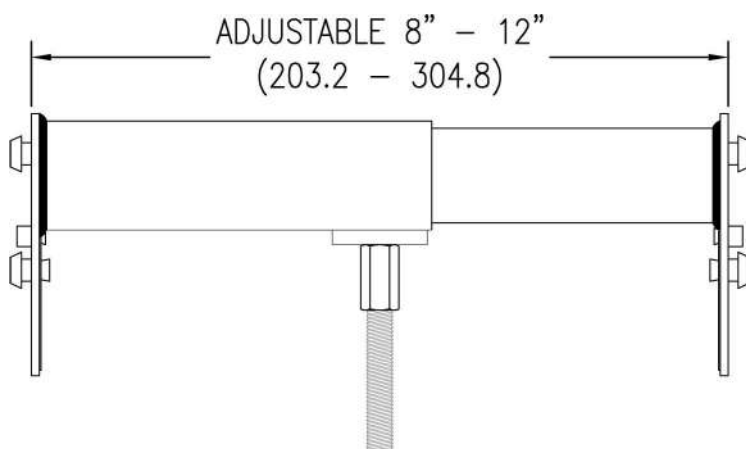


Fig. No.	Flue Space Length		Std. Package	Max. Rec. Load		Wt. Each	
				lbs.	kN	lbs.	kg
990	8 - 12	(203 - 305)	5	730	(3.25)	3.50	(1.59)

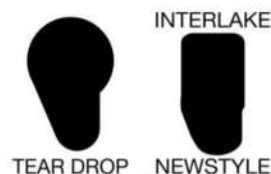


FIG. 995

SINGLE IN-RACK FLUE HANGER

- Function:** Designed to connect to common warehouse racking types such as teardrop.
- Size:** $\frac{3}{8}$ " rod
- Material:** Carbon steel
- Finish:** Electro-galvanized
- Install:** Insert the support rivets into rack columns. Pull device down securing it into the rack columns ensuring spring clip snaps in engaging the rack column. Adjust the strut nut to the desired position then insert threaded rod until it fully engages into the strut nut.
- Ordering:** Specify figure number.

NOTE: Supplied with PHD Fig. 3106 3/8-16 spring strut nut and PHD Fig. 4405 end cap.

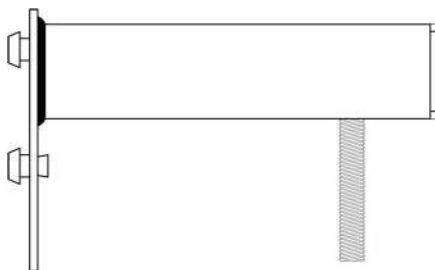
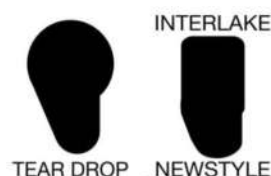


Fig. No.	Flue Space Length		Std. Package	Max. Rec. Load		Wt. Each	
				lbs.	kN	lbs.	kg
995	7	(178)	10	125	(0.56)	1.65	(0.75)



SEISMIC BRACING



SWAY BRACE PIPE ATTACHMENT

FIG. 010

Function: Designed for bracing pipe against sway and seismic disturbance. The pipe attachment component of a sway brace system used in conjunction with a PHD Manufacturing structural attachment fitting, and joined together with a bracing pipe element forms a complete sway brace assembly. Sway brace assemblies are intended to be installed in accordance with NFPA 13 and the manufacturer's installation instructions.

Size: Pipe size 1" (25) thru 4" (100).

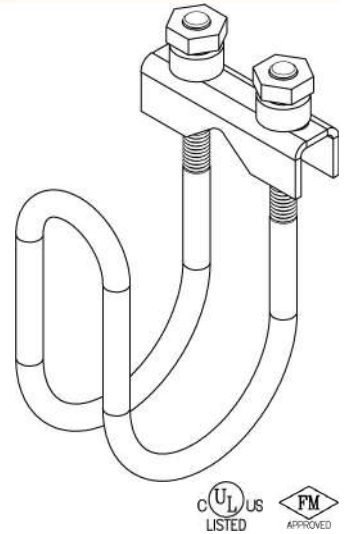
Material: Carbon steel

Finish: Electro-galvanized

Install: Place over the pipe to be braced, adjust brace angle, and insert bracing pipe through opening leaving a minimum of 1" (25.4) extending from attachment. Brace pipe can be installed on top or bottom of pipe to be braced but must be a minimum of 6" (152.4) away from a pipe joint. Tighten nuts down evenly until hex heads break off.

Approvals: Underwriters Laboratories listed for US and Canada and Factory Mutual approved. Listed for use with NFPA and PHD sway brace components only.

Ordering: Specify figure number, brace pipe size, and sprinkler pipe size.



UL Maximum Design Load							
Pipe Size SCH 40		lbs.	kN	Wt. Each			
				1" (25mm) Brace Pipe		1 1/4" (32mm) Brace Pipe	
				lbs.	kg	lbs.	kg
1	(25)	680	(3.02)	0.71	(0.32)	0.75	(0.34)
1 1/4	(32)	680	(3.02)	0.76	(0.34)	0.79	(0.36)
1 1/2	(40)	680	(3.02)	0.79	(0.36)	0.82	(0.37)
2	(50)	680	(3.02)	0.84	(0.38)	0.88	(0.40)
2 1/2	(65)	680	(3.02)	0.90	(0.41)	0.94	(0.43)
3	(80)	680	(3.02)	0.98	(0.44)	1.02	(0.46)
4	(100)	680	(3.02)	1.10	(0.50)	1.14	(0.52)

UL's current Listings, shown above, are predicated on installation in accordance with the latest edition of NFPA 13. The 2016 and earlier editions of NFPA 13 referenced a minimum safety of 1.5 for the load rating as compared to 2.2 for the current edition.

The load ratings noted in table below, Previously Listed Loads, are consistent with the historical cULus Listings that were evaluated to the requirements of UL 203A, Outline of Investigation for Sway Brace Devices for Fire Sprinkler System Piping, based upon a minimum safety factor of 1.5 in accordance with the earlier editions of NFPA 13. The load ratings based upon the 2016 or earlier editions of NFPA 13 should only be used where approved by the Authority Having Jurisdiction (AHJ).

Previously Listed UL Loads							
Pipe Size SCH 40		lbs.	kN	Wt. Each			
				1" (25mm) Brace Pipe		1 1/4" (32mm) Brace Pipe	
				lbs.	kg	lbs.	kg
**1	(25)	*1000	*(4.45)	0.71	(0.32)	0.75	(0.34)
1 1/4	(32)	*1000	*(4.45)	0.76	(0.34)	0.79	(0.36)
1 1/2	(40)	*1000	*(4.45)	0.79	(0.36)	0.82	(0.37)
2	(50)	*1000	*(4.45)	0.84	(0.38)	0.88	(0.40)
2 1/2	(65)	*1000	*(4.45)	0.90	(0.41)	0.94	(0.43)
3	(80)	*1000	*(4.45)	0.98	(0.44)	1.02	(0.46)
4	(100)	*1000	*(4.45)	1.10	(0.50)	1.14	(0.52)

*Load ratings are based on a minimum safety factor of 1.5 in accordance with NFPA 13-2016 Section A.9.3.5.2.3.

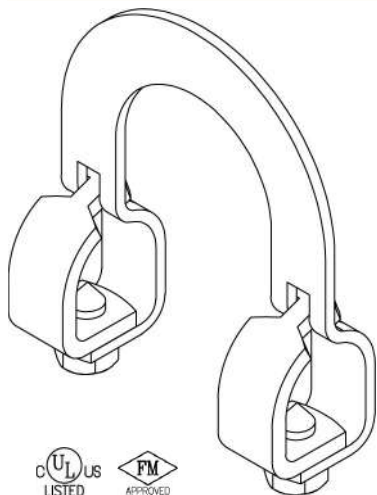
** Restraint only

FM Maximum Design Load				
Brace Pipes 1" or 1 1/4"				
(GB/T3091, EN10255H, or JISG3454)				
Pipe Size SCH 10, 40 & Flow Pipe	Brace Angle From Vertical (Degrees)	lbs.	kN	
1 (25)	30° - 44°	340	(1.51)	
	45° - 59°	480	(2.13)	
	60° - 74°	590	(2.62)	
	75° - 90°	660	(2.93)	
1 1/4 (32)	30° - 44°	350	(1.55)	
	45° - 59°	500	(2.22)	
	60° - 74°	610	(2.71)	
	75° - 90°	680	(3.02)	
1 1/2 (40)	30° - 44°	290	(1.28)	
	45° - 59°	420	(1.86)	
	60° - 74°	510	(2.26)	
	75° - 90°	570	(2.53)	
2 (50)	30° - 44°	390	(1.73)	
	45° - 59°	550	(2.44)	
	60° - 74°	670	(2.98)	
	75° - 90°	750	(3.33)	
2 1/2 (65)	30° - 44°	440	(1.95)	
	45° - 59°	620	(2.75)	
	60° - 74°	760	(3.38)	
	75° - 90°	850	(3.78)	
3 (80)	30° - 44°	470	(2.09)	
	45° - 59°	660	(2.93)	
	60° - 74°	810	(3.33)	
	75° - 90°	910	(4.04)	
4 (100)	30° - 44°	430	(1.91)	
	45° - 59°	610	(2.71)	
	60° - 74°	750	(3.33)	
	75° - 90°	840	(3.73)	

When governed by NFPA13 2019 or later, multiply FM approved loads by 0.682.

FIG. 015

LARGE SWAY BRACE PIPE ATTACHMENT



Function: Designed for bracing pipe against sway and seismic disturbance. The pipe attachment component of a sway brace system used in conjunction with a PHD Manufacturing structural attachment fitting, and joined together with a bracing pipe element forms a complete sway brace assembly. Sway brace assemblies are intended to be installed in accordance with NFPA 13 and the manufacturer's installation instructions.

Size: Pipe size 2½" thru 8".

Material: Carbon steel

Finish: Electro-galvanized

Install: Place over the pipe to be braced, adjust brace angle, and insert bracing pipe through opening leaving a minimum of 1" extending from attachment. Brace pipe can be installed on top or bottom of pipe to be braced but must be a minimum of 6" away from a pipe joint. Tighten two hex head cone point set bolts until heads bottom out on attachment, ensuring proper torque has been applied.

Approvals: Underwriters Laboratories listed for US and Canada (2½" thru 6" only) and Factory Mutual approved. Listed for use with NFPA and PHD sway brace components only.

Ordering: Specify figure number, brace pipe size, and sprinkler pipe size.

NOTE: (This product is not compatible with metric pipe.) For metric piping see Fig. 010, Fig. 031, or Fig. 040.

FM Maximum Design Load							
Brace: 1" Thru 1¼" SCH40 Pipe							
Pipe Size SCH 10, 40 & Flow Pipe	Brace Angle From Vertical (Degrees)	lbs.	kN	Wt. Each			
				1" Brace Pipe		1¼" Brace Pipe	
				lbs.	kg	lbs.	kg
2½	30°-44°	1020	(4.53)	1.31	(0.59)	1.49	(0.68)
	45°-59°	1440	(6.40)	1.31	(0.59)	1.49	(0.68)
	60°-74°	1770	(7.87)	1.31	(0.59)	1.49	(0.68)
	75°-90°	1970	(8.76)	1.31	(0.59)	1.49	(0.68)
3	30°-44°	1080	(4.80)	1.40	(0.64)	1.57	(0.71)
	45°-59°	1530	(6.80)	1.40	(0.64)	1.57	(0.71)
	60°-74°	1870	(8.31)	1.40	(0.64)	1.57	(0.71)
	75°-90°	2090	(9.29)	1.40	(0.64)	1.57	(0.71)
4	30°-44°	1020	(4.53)	1.53	(0.69)	1.70	(0.77)
	45°-59°	1450	(6.44)	1.53	(0.69)	1.70	(0.77)
	60°-74°	1770	(7.87)	1.53	(0.69)	1.70	(0.77)
	75°-90°	1980	(8.80)	1.53	(0.69)	1.70	(0.77)
6	30°-44°	640	(2.84)	1.81	(0.82)	1.98	(0.90)
	45°-59°	900	(4.00)	1.81	(0.82)	1.98	(0.90)
	60°-74°	1110	(4.93)	1.81	(0.82)	1.98	(0.90)
	75°-90°	1240	(5.51)	1.81	(0.82)	1.98	(0.90)
8	30°-44°	570	(2.53)	2.07	(0.94)	2.24	(1.02)
	45°-59°	810	(3.60)	2.07	(0.94)	2.24	(1.02)
	60°-74°	990	(4.40)	2.07	(0.94)	2.24	(1.02)
	75°-90°	1100	(4.89)	2.07	(0.94)	2.24	(1.02)

When governed by NFPA13 2019 or later, multiply FM approved loads by 0.682.

UL Maximum Design Load		
Pipe Size SCH 10 & 40	lbs.	kN
2½	680	(3.02)
3	680	(3.02)
4	680	(3.02)
6	1090	(4.85)
UL's current Listings, shown above, are predicated on installation in accordance with the latest edition of NFPA 13. The 2016 and earlier editions of NFPA 13 referenced a minimum safety of 1.5 for the load rating as compared to 2.2 for the current edition.		
The load ratings noted in table below, Previously Listed Loads, are consistent with the historical cULus Listings that were evaluated to the requirements of UL 203A, Outline of Investigation for Sway Brace Devices for Fire Sprinkler System Piping, based upon a minimum safety factor of 1.5 in accordance with the earlier editions of NFPA 13. The load ratings based upon the 2016 or earlier editions of NFPA 13 should only be used where approved by the Authority Having Jurisdiction (AHJ).		
Previously Listed UL Loads		
Pipe Size SCH 10 & 40	lbs.	kN
2½	*1000	*(4.45)
3	*1000	*(4.45)
4	*1000	*(4.45)
6	*1600	*(7.12)
*Load ratings are based on a minimum safety factor of 1.5 in accordance with NFPA 13-2016 Section A.9.3.5.2.3.		

SEISMIC BRACING



MULTI-FASTENER ADAPTER

FIG. 025

Function: Designed for bracing pipe against sway and seismic disturbances. Sway brace adapter used to develop a greater structural connection by providing multiple fastener attachment points. Adapter allows for 2 or 3 NFPA 13 approved fasteners to be used when one fastener is too weak to anchor a sway brace assembly to a structure. Sway brace assemblies are intended to be installed in accordance with NFPA 13 and the manufacturer's installation instructions.

Size: $\frac{1}{2}$ " or $\frac{3}{4}$ " mounting holes. Braces up to 8" Pipe MAX

Material: Carbon steel, $2\frac{1}{2}$ " X $2\frac{1}{2}$ " X $\frac{5}{16}$ " angle

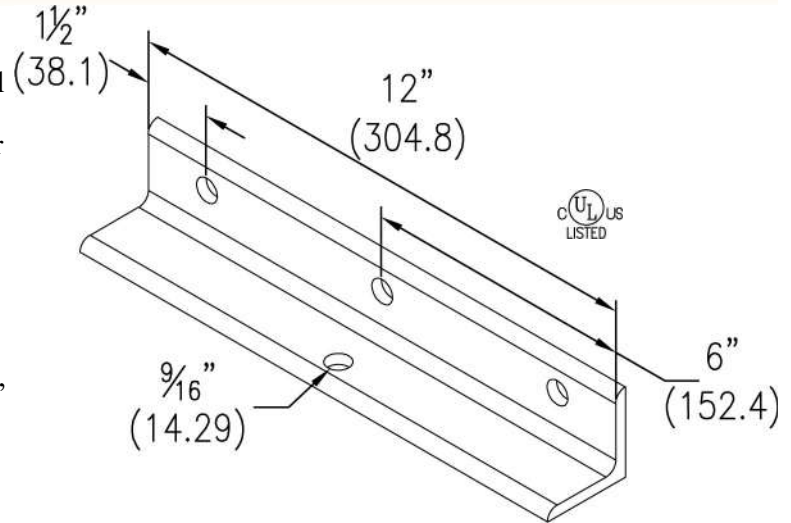
Finish: Electro-galvanized

Install: Attach to the structural surface as noted in NFPA13 fastener tables. Please note that the two outermost bolt holes must be used and the middle bolt hole should be used only in conjunction with both outermost bolt holes to ensure concentric loading. Attach a PHD Manufacturing structural attachment fitting to PHD Fig. 025 and follow the instructions provided with said fitting. The PHD structural attachment fitting can pivot around the mounting connection for adjustment to the desired brace angle. Please note that the maximum load will be limited by the PHD Manufacturing structural attachment utilized with this adapter.

Approvals: Underwriters Laboratories listed for US and Canada. Listed for use with NFPA fastener tables and PHD sway brace components only.

Ordering: Specify figure number and fastener size.

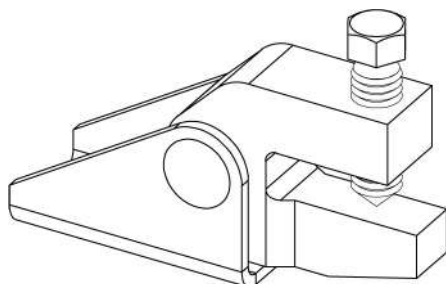
NOTE: All connecting fasteners are sold separately.



UL Maximum Design Load (8" Pipe Max)				
Fastener Size	lbs.	kN	Wt. Each	
			lbs.	kg
$\frac{1}{2}$	1370	(6.09)	4.55	(2.06)
$\frac{3}{4}$	1370	(6.09)	4.55	(2.06)
UL's current Listings, shown above, are predicated on installation in accordance with the latest edition of NFPA 13. The 2016 and earlier editions of NFPA 13 referenced a minimum safety of 1.5 for the load rating as compared to 2.2 for the current edition.				
The load ratings noted in table below, Previously Listed Loads, are consistent with the historical cULus Listings that were evaluated to the requirements of UL 203A, Outline of Investigation for Sway Brace Devices for Fire Sprinkler System Piping, based upon a minimum safety factor of 1.5 in accordance with the earlier editions of NFPA 13. The load ratings based upon the 2016 or earlier editions of NFPA 13 should only be used where approved by the Authority Having Jurisdiction (AHJ).				
Previously Listed UL Loads (8" Pipe Max)				
Fastener Size	lbs.	kN	Wt. Each	
			lbs.	kg
$\frac{1}{2}$	*2015	*(8.96)	4.55	(2.06)
$\frac{3}{4}$	*2015	*(8.96)	4.55	(2.06)
*Load ratings are based on a minimum safety factor of 1.5 in accordance with NFPA 13-2016 Section A.9.3.5.2.3.				

FIG. 030

C-CLAMP STRUCTURAL ATTACHMENT



Function: Designed for bracing pipe against sway and seismic disturbances. Universal swivel design allows for attachment at any surface angle combined with concentric loading. Structure attachment fitting designed to use 1" thru 2" SCH 40 pipe, structural steel, and PHD 12 gauge strut channel (1001 & 1201) as sway bracing elements. No bracing member thicker than $\frac{3}{8}$ " can be used in conjunction with this product. Utilize the Fig. 030 with a PHD Manufacturing pipe attachment fitting and a bracing element to form a complete sway brace assembly. Sway brace assemblies are intended to be installed in accordance with NFPA 13 and the manufacturer's installation instructions.

Size: $\frac{1}{2}$ " mounting hole. Braces up to 8" Pipe MAX

Material: Ductile iron and carbon steel

Finish: Electro-galvanized

Install: Mount device to structure then insert brace element into fitting against back of jaw. Tighten set screw finger tight, then tighten until hex head breaks off. Adjust attachment to proper brace angle.

Approvals: Underwriters Laboratories listed for US and Canada and Factory Mutual approved. Listed for use with NFPA fastener tables and PHD sway brace components only.

Ordering: Specify figure number.

UL Maximum Design Loads (Up to 8" Pipe) - Lateral & Longitudinal Assemblies						
Brace Member	Member Thickness	Member Length	lbs.	kN	Wt. Each	
					lbs.	kg
1" Thru 2" Pipe	SCH 40	Refer to NFPA13	1370	(6.09)	1.23	(0.56)
Structural Steel	$\frac{3}{8}$ " thick MAX	Refer to NFPA13	1370	(6.09)	1.23	(0.56)
1001 Series Strut	12 Ga.	See Chart Below	1370	(6.09)	1.23	(0.56)
1201 Series Strut	12 Ga.	See Chart Below	1370	(6.09)	1.23	(0.56)

UL's current Listings, shown above, are predicated on installation in accordance with the latest edition of NFPA 13. The 2016 and earlier editions of NFPA 13 referenced a minimum safety of 1.5 for the load rating as compared to 2.2 for the current edition.

The load ratings noted in table below, Previously Listed Loads, are consistent with the historical cULus Listings that were evaluated to the requirements of UL 203A, Outline of Investigation for Sway Brace Devices for Fire Sprinkler System Piping, based upon a minimum safety factor of 1.5 in accordance with the earlier editions of NFPA 13. The load ratings based upon the 2016 or earlier editions of NFPA 13 should only be used where approved by the Authority Having Jurisdiction (AHJ).

Previously Listed UL Loads (Up to 8" Pipe) - Lateral & Longitudinal Assemblies						
Brace Member	Member Thickness	Member Length	lbs.	kN	Wt. Each	
					lbs.	kg
1" Thru 2" Pipe	SCH 40	Refer to NFPA13	*2015	*(8.96)	1.23	(0.56)
Structural Steel	$\frac{3}{8}$ " thick MAX	Refer to NFPA13	*2015	*(8.96)	1.23	(0.56)
1001 Series Strut	12 Ga.	See Chart Below	*2015	*(8.96)	1.23	(0.56)
1201 Series Strut	12 Ga.	See Chart Below	*2015	*(8.96)	1.23	(0.56)

*Load ratings are based on a minimum safety factor of 1.5 in accordance with NFPA 13-2016 Section A.9.3.5.2.3.

FM Maximum Design Load				
For Bracing SCH 10, 40 & Flow Pipe				
Brace Member		Brace Angle From Vertical (Degrees)	lbs.	kN
1" Thru 2" SCH 40 Pipe	(GB/T3091, EN10255H, or JISG3454)	30°-44°	1270	(5.64)
		45°-59°	2040	(9.07)
		60°-74°	2450	(10.89)
		75°-90°	2740	(12.18)
1/4" Thru 3/8" Thick Structural Steel		30°-44°	900	(4.00)
		45°-59°	1280	(5.69)
		60°-74°	1570	(6.98)
		75°-90°	1750	(7.78)
PHD 12 Gauge Strut Channel 1001 & 1201		30°-44°	1070	(4.75)
		45°-59°	1440	(6.40)
		60°-74°	1740	(7.73)
		75°-90°	1940	(8.62)

When governed by NFPA13 2019 or later, multiply FM approved loads by 0.682.

Strut Fig. #	PHD Strut Channel Maximum Horizontal Load 90° From Vertical											
	r		l/r =	100			200			300		
				Max	lbs.	kN	Max	lbs.	kN	Max	lbs.	kN
1001	0.580	(14.73)	58"	(1473.2)	4670	(20.77)	116"	(2946.4)	1165	(5.18)	174"	(4419.6)
1201	0.297	(7.54)	29"	(736.6)	3260	(14.50)	59"	(1498.6)	785	(3.49)	89"	(2260.6)

FIG. 031 Horizontal Prying Factors Per NFPA 13											
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)	2.396 (60.85)	1.098 (27.90)	1.285 (32.64)	1.677 (42.60)	1.353 (34.36)	2.125 (53.98)	2.570 (65.28)	1.817 (46.16)	1.484 (37.69)		

* Brace Orientation per NFPA 13.

** Brace Pipe Angles are determined from vertical.

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

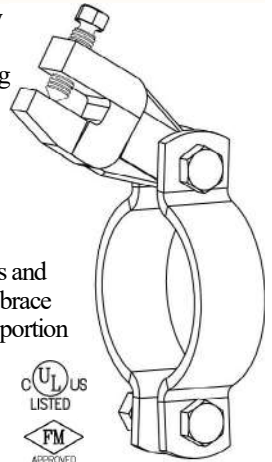
SEISMIC BRACING



CLAMPING PIPE ATTACHMENT

FIG. 031

- Function:** Designed for bracing pipe against sway and seismic disturbance. Versatile design allows for attachment at any angle and the ability to be used in a lateral or longitudinal bracing configuration. The pipe attachment component of a sway brace system used in conjunction with a PHD Manufacturing structural attachment fitting and joined together with a bracing element form a complete sway brace assembly. Sway brace assemblies are intended to be installed in accordance with NFPA 13 and the manufacturer's installation instructions.
- Size:** Pipe sizes 2" thru 8". Can use 1" thru 2" SCH 40 pipe, structural steel, and PHD 12 gauge strut channel (1001 & 1201) as sway bracing elements.
- Material:** Ductile iron and carbon steel.
- Finish:** Electro-galvanized
- Install:** Place attachment around pipe to be braced, positioning brace attachment as needed, then tighten clamping bolts and nuts finger tight. Insert brace component into fitting against back of jaw. Tighten set screw finger tight, adjust brace angle as needed, then tighten set screw until hex head breaks off. Then evenly torque clamping bolts until hex portion of clamping nuts break off.
- Approvals:** Underwriters Laboratories listed for US and Canada and Factory Mutual approved. Listed for use with PHD sway brace components only.
- Ordering:** Specify figure number and sprinkler pipe size.



UL Maximum Design Loads				
All Pipe Sizes, SCH 10 & 40 (3 1/2 SCH 40 only) Lateral & Longitudinal Assemblies				
Brace Member	Member Thickness	Member Length	lbs.	kN
1" Thru 2" Pipe	SCH 40	Refer to NFPA13	1370	(6.09)
Structural Steel	1/4" & 3/8" thick	Refer to NFPA13	1370	(6.09)
1001 Series Strut	12 Ga.	See Chart Below	1370	(6.09)
1201 Series Strut	12 Ga.	See Chart Below	1370	(6.09)
UL's current Listings, shown above, are predicated on installation in accordance with the latest edition of NFPA 13. The 2016 and earlier editions of NFPA 13 referenced a minimum safety of 1.5 for the load rating as compared to 2.2 for the current edition.				
The load ratings noted in table below, Previously Listed Loads, are consistent with the historical cULus Listings that were evaluated to the requirements of UL 203A, Outline of Investigation for Sway Brace Devices for Fire Sprinkler System Piping, based upon a minimum safety factor of 1.5 in accordance with the earlier editions of NFPA 13. The load ratings based upon the 2016 or earlier editions of NFPA 13 should only be used where approved by the Authority Having Jurisdiction (AHJ).				
Previously Listed UL Loads				
All Pipe Sizes, SCH 10 & 40 (3 1/2 SCH 40 only) Lateral & Longitudinal Assemblies				
Brace Member	Member Thickness	Member Length	lbs.	kN
1" Thru 2" Pipe	SCH 40	Refer to NFPA13	*2015	*(8.96)
Structural Steel	1/4" & 3/8" thick	Refer to NFPA13	*2015	*(8.96)
1001 Series Strut	12 Ga.	See Chart Below	*2015	*(8.96)
1201 Series Strut	12 Ga.	See Chart Below	*2015	*(8.96)
*Load ratings are based on a minimum safety factor of 1.5 in accordance with NFPA 13-2016 Section A.9.3.5.2.3.				
FM Maximum Design Load (All Sizes)				
For Bracing SCH 10, 40 & Flow Pipe				
Brace Member	Direction	Brace Angle (Degrees)	lbs.	kN
1" Thru 2" SCH 40 Pipe	Lateral	30°-44°	1270	(5.64)
		45°-59°	1800	(9.07)
		60°-74°	2200	(10.89)
		75°-90°	2460	(12.18)
1/4" Thru 3/8" Thick Structural Steel	Lateral & Longitudinal	30°-44°	900	(4.00)
		45°-59°	1280	(5.69)
		60°-74°	1570	(6.98)
		75°-90°	1750	(7.78)
PHD 12 Gauge Strut Channel 1001 & 1201	Lateral & Longitudinal	30°-44°	1070	(4.75)
		45°-59°	1440	(6.40)
		60°-74°	1740	(7.73)
		75°-90°	1940	(8.62)

When governed by NFPA13 2019 or later, multiply FM approved loads by 0.682.

FM Maximum Design Load					
Brace: 1" Thru 2" SCH40 Pipe (GB/T3091, EN10255H, or JISG3454)					
Pipe Size SCH 10, 40 & Flow Pipe	Brace Angle From Vertical (Degrees)	Longitudinal	Wt. Each		
		lbs.	kN	lbs.	kg
2 (50)	30°-44°	1370	(6.09)	2.60	(1.18)
	45°-59°	1930	(8.58)		
	60°-74°	2370	(10.54)		
	75°-90°	2810	(12.49)		
2 1/2 (65)	30°-44°	1500	(6.67)	2.77	(1.26)
	45°-59°	2120	(9.43)		
	60°-74°	2600	(11.56)		
	75°-90°	2900	(12.89)		
3 (80)	30°-44°	1370	(6.09)	3.00	(1.36)
	45°-59°	1930	(8.58)		
	60°-74°	2370	(10.54)		
	75°-90°	2810	(12.49)		
3 1/2 (90)	30°-44°	1370	(6.09)	3.13	(1.42)
	45°-59°	1930	(8.58)		
	60°-74°	2370	(10.54)		
	75°-90°	2810	(12.49)		
4 (100)	30°-44°	1370	(6.09)	3.30	(1.50)
	45°-59°	1930	(8.58)		
	60°-74°	2370	(10.54)		
	75°-90°	2810	(12.49)		
5 (125)	30°-44°	1370	(6.09)	4.57	(2.07)
	45°-59°	1930	(8.58)		
	60°-74°	2370	(10.54)		
	75°-90°	2810	(12.49)		
6 (150)	30°-44°	1410	(6.27)	5.42	(2.46)
	45°-59°	2000	(8.89)		
	60°-74°	2450	(10.89)		
	75°-90°	2730	(12.14)		
8 (200)	30°-44°	1320	(5.87)	8.52	(3.86)
	45°-59°	1870	(8.31)		
	60°-74°	2290	(10.18)		
	75°-90°	2550	(11.34)		

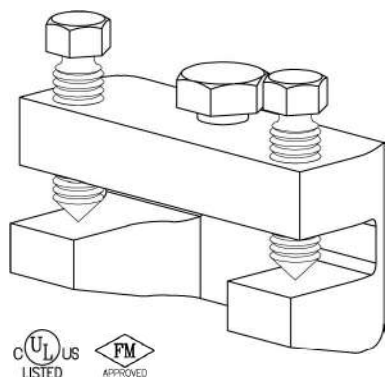
When governed by NFPA13 2019 or later, multiply FM approved loads by 0.682.

Strut Fig. #	PHD Strut Channel Maximum Horizontal Load 90° From Vertical														
	r		l/r =	100			200			300					
				Max	lbs.	kN	Max	lbs.	kN	Max	lbs.	kN			
1001	0.580	(14.73)		58"	(1473.2)	4670	(20.77)	116"	(2946.4)	1165	(5.18)	174"	(4419.6)	518	(2.30)
1201	0.297	(7.54)		29"	(736.6)	3260	(14.50)	59"	(1498.6)	785	(3.49)	89"	(2260.6)	345	(1.53)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

FIG. 035

SWAY BRACE BAR JOIST ADAPTER



Function:

Sway brace adapter used to attach a PHD Manufacturing sway brace assembly to a steel bar joist or structural member of $\frac{3}{8}$ " maximum thickness. To provide a point of connection when drilling or welding is not allowed or not practical. Sway brace assemblies are intended to be installed in accordance with NFPA 13 and the manufacturer's installation instructions.

Size:

Braces up to 8" Pipe MAX. Attaches to $\frac{3}{8}$ " thick MAX structural members. When attaching to a structure thicker than $\frac{3}{8}$ ", please see PHD Manufacturing Fig. 045.

Material:

Ductile iron

Finish:

Electro-galvanized

Install:

Place on structural member with the flange contacting the back of the jaw. Tighten set screws finger tight, then evenly tighten until hex heads break off. Attach PHD structural attachment to Fig. 035 with the supplied attachment bolt, ensuring that the attachment bolt head bottoms out securely. Please note that the maximum load will be limited by the PHD Manufacturing structural attachment utilized with this adapter.

Approvals: Underwriters Laboratories listed for US and Canada and Factory Mutual approved. Listed for use with NFPA fastener tables and PHD sway brace components only.

Ordering: Specify figure number.

UL Maximum Design Load					
Pipe Size		lbs.	kN	Wt. Each	
				lbs.	kg
8" MAX	(200)	1370	(6.09)	2.38	(1.08)

UL's current Listings, shown above, are predicated on installation in accordance with the latest edition of NFPA 13. The 2016 and earlier editions of NFPA 13 referenced a minimum safety of 1.5 for the load rating as compared to 2.2 for the current edition.

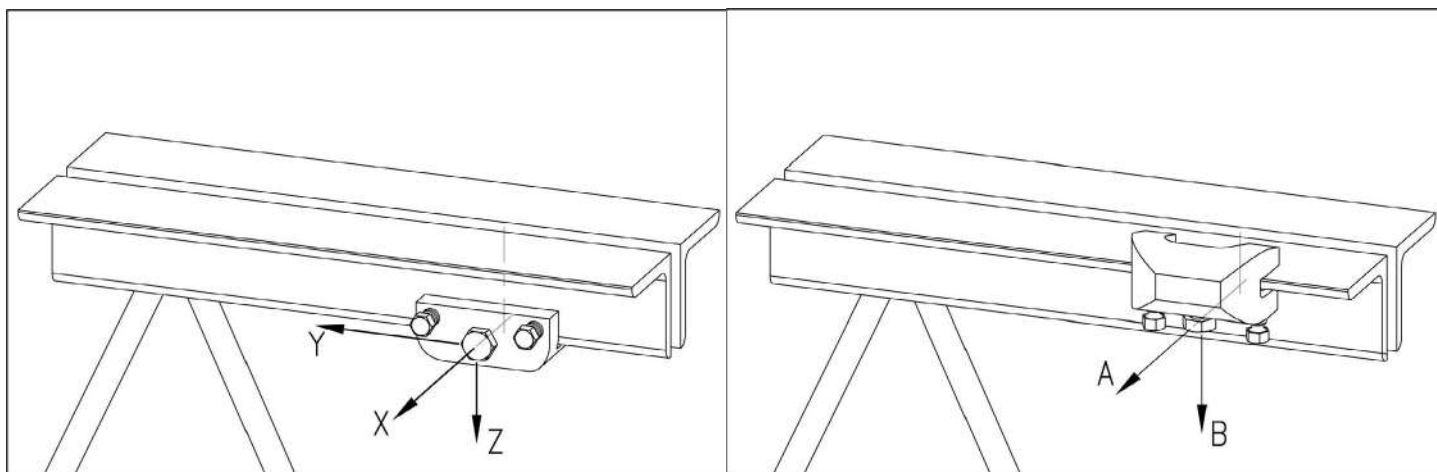
The load ratings noted in table below, Previously Listed Loads, are consistent with the historical cULus Listings that were evaluated to the requirements of UL 203A, Outline of Investigation for Sway Brace Devices for Fire Sprinkler System Piping, based upon a minimum safety factor of 1.5 in accordance with the earlier editions of NFPA 13. The load ratings based upon the 2016 or earlier editions of NFPA 13 should only be used where approved by the Authority Having Jurisdiction (AHJ).

Previously Listed UL Loads					
Pipe Size		lbs.	kN	Wt. Each	
				lbs.	kg
8" MAX	(200)	*2015	*(8.96)	2.38	(1.08)

*Load ratings are based on a minimum safety factor of 1.5 in accordance with NFPA 13-2016 Section A.9.3.5.2.3.

FM Maximum Design Load							
Beam Flange Thickness	Brace Angle From Vertical (Degrees)	X-Z		Y-Z		A-B	
		lbs.	kN	lbs.	kN	lbs.	kN
$\frac{3}{8}$ " Max	30°-44°	1040	(4.62)	970	(4.31)	1150	(5.11)
	45°-59°	1490	(6.62)	1370	(6.09)	1660	(7.38)
	60°-74°	1800	(8.00)	2060	(9.16)	1990	(8.85)
	75°-90°	2010	(8.94)	2300	(10.23)	2220	(9.87)

When governed by NFPA13 2019 or later, multiply FM approved loads by 0.682.



SEISMIC BRACING



SUPPORTING PIPE ATTACHMENT

FIG. 040

Function: Designed for bracing pipe against sway and seismic disturbance. Versatile design allows for attachment at any angle and the ability to be used in a lateral or longitudinal bracing configuration. The pipe attachment component of a sway brace system used in conjunction with two PHD Manufacturing structural attachment fittings and joined together with a bracing element form a complete sway brace assembly. Sway brace assemblies are intended to be installed in accordance with NFPA 13 and the manufacturer's installation instructions.

Size: Pipe sizes 2" thru 8". Refer to PHD Structural attachment fitting literature regarding appropriate brace members, sizes, and further loading limitations.

Material: Carbon steel

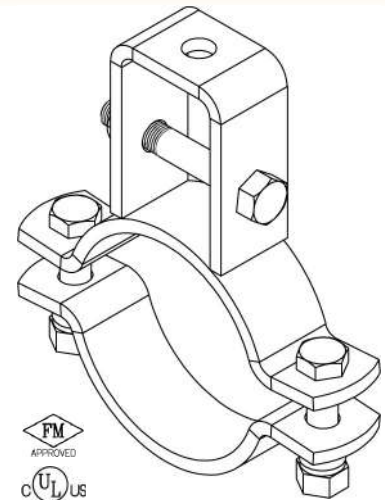
Finish: Electro-galvanized

Install: Attach PHD Manufacturing structural attachment fitting, Fig. 030 (sold separately), to Fig. 040 using supplied fastener. Place the assembly around the pipe to be braced, positioning welded clevis on top of the pipe, then tighten clamping bolts and nuts finger tight. Follow PHD Manufacturing structural attachment fitting's instructions for attaching to brace element. Adjust the brace element to the desired angle then tighten the supplied fastener to lock the PHD Manufacturing structural attachment fitting, Fig. 030, securely in position with the Fig. 040. Then evenly torque clamping bolts until hex portion of clamping nuts break off.

Approvals: Underwriters Laboratories listed for US and Canada as a hanger. Factory Mutual approved as a sway brace only. Listed for use with PHD sway brace components only.

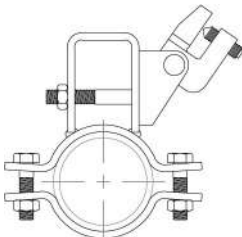
Ordering: Specify figure number and sprinkler pipe size.

NOTE: Figure 030 sold separately.

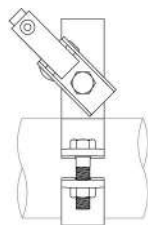


UL Maximum Design Load							
Pipe Size SCH 10 & 40		Hanger Rod Size		Rec. Max. Hanger Load		Wt. Each	
				lbs.	kN	lbs.	kg
2	(50)	3/8	(10)	730	(3.25)	2.40	(1.09)
2½	(65)	1/2	(12)	850	(3.78)	2.58	(1.17)
3	(80)	1/2	(12)	1000	(4.45)	2.80	(1.27)
*3½	(90)	1/2	(12)	1000	(4.45)	2.94	(1.33)
4	(100)	5/8	(16)	1000	(4.45)	3.28	(1.49)
5	(125)	5/8	(16)	1600	(7.12)	4.95	(2.25)
6	(150)	3/4	(20)	1600	(7.12)	6.93	(3.14)
8	(200)	3/4	(20)	2015	(8.96)	9.97	(4.52)

* SCH 40 pipe only



Lateral Brace



Longitudinal Brace

FM Maximum Design Load						
Pipe Size SCH 10, 40 & Flow Pipe		Brace Angle From Vertical (Degrees)	Lateral		Longitudinal	
			lbs.	kN	lbs.	kN
2	(50)	30°-44°	1070	(4.75)	1260	(5.60)
		45°-59°	1520	(6.76)	1440	(6.40)
		60°-74°	1860	(8.27)	1740	(7.73)
		75°-90°	2080	(9.25)	1940	(8.62)
2½	(65)	30°-44°	960	(4.27)	1000	(4.44)
		45°-59°	1360	(6.04)	1420	(6.31)
		60°-74°	1670	(7.42)	1740	(7.73)
		75°-90°	1860	(8.27)	1940	(8.62)
3	(80)	30°-44°	960	(4.27)	1000	(4.44)
		45°-59°	1360	(6.04)	1420	(6.31)
		60°-74°	1670	(7.42)	1740	(7.73)
		75°-90°	1860	(8.27)	1940	(8.62)
3½	(90)	30°-44°	960	(4.27)	1000	(4.44)
		45°-59°	1360	(6.04)	1420	(6.31)
		60°-74°	1670	(7.42)	1740	(7.73)
		75°-90°	1860	(8.27)	1940	(8.62)
4	(100)	30°-44°	960	(4.27)	1110	(4.93)
		45°-59°	1360	(6.04)	1490	(6.62)
		60°-74°	1670	(7.42)	1800	(8.00)
		75°-90°	1860	(8.27)	1920	(8.54)
5	(125)	30°-44°	960	(4.27)	1110	(4.93)
		45°-59°	1360	(6.04)	1490	(6.62)
		60°-74°	1670	(7.42)	1800	(8.00)
		75°-90°	1860	(8.27)	1920	(8.54)
6	(150)	30°-44°	1000	(4.44)	1280	(5.69)
		45°-59°	1420	(6.31)	1810	(8.05)
		60°-74°	1740	(7.73)	2210	(9.83)
		75°-90°	1940	(8.62)	2470	(10.98)
8	(200)	30°-44°	1350	(6.00)	1160	(5.15)
		45°-59°	1900	(8.45)	1650	(7.33)
		60°-74°	2330	(10.36)	2020	(8.98)
		75°-90°	2600	(11.56)	2250	(10.00)

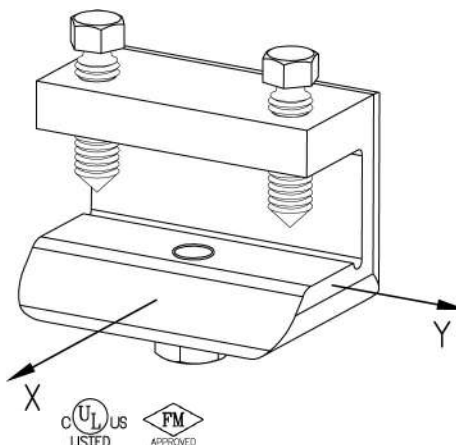
When governed by NFPA13 2019 or later, multiply FM approved loads by 0.682.

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

THREADED ACCESSORIES
CPVC STRAPS
BAND HANGERS
BEAM CLAMPS
CLEVIS HANGERS
PIPE ROLLER SUPPORTS
SPLIT RING HANGERS
PIPE CLAMPS
CENTER LOAD BEAM CLAMPS
PIPE SHIELDS, INSULATION, & SADDLES
PIPE GUIDES & SLIDES
WALL BRACKETS
PIPE SUPPORTS
STRUCTURAL ATTACHMENTS
SEISMIC BRACING

FIG. 045

SWAY BRACE STRUCTURAL ADAPTER



Function: Sway brace adapter used to attach a PHD Manufacturing sway brace assembly to a steel structural member of $\frac{3}{8}$ " minimum and $1\frac{1}{4}$ " maximum thickness. To provide a point of connection when drilling or welding is not allowed or not practical. Sway brace assemblies are intended to be installed in accordance with NFPA 13 and the manufacturer's installation instructions.

Size: Braces up to 8" Pipe MAX. Attaches to $\frac{3}{8}$ " MINIMUM and $1\frac{1}{4}$ " MAX thick structural members. When attaching to a structure less than $\frac{3}{8}$ " thick, please see PHD Manufacturing Fig. 035.

Material: Ductile iron

Finish: Electro-galvanized

Install: Place on structural member with the flange contacting the back of the jaw. Tighten set screws finger tight, then evenly tighten until hex heads break off. Attach PHD structural attachment to Fig. 045 with the supplied attachment bolt, ensuring that the attachment bolt head bottoms out securely. Please note that the maximum load will be limited by the PHD Manufacturing structural attachment utilized with this adapter.

Approvals: Underwriters Laboratories listed for US and Canada and Factory Mutual approved. Listed for use with NFPA fastener tables and PHD sway brace components only.

Ordering: Specify figure number.

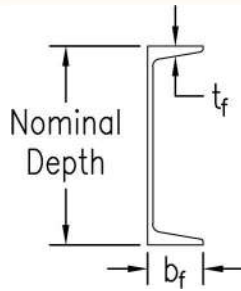
UL Maximum Design Load					
Pipe Size		lbs.	kN	Wt. Each	
				lbs.	kg
8" MAX	(200)	1370	(6.09)	2.38	(1.08)
UL's current Listings, shown above, are predicated on installation in accordance with the latest edition of NFPA 13. The 2016 and earlier editions of NFPA 13 referenced a minimum safety of 1.5 for the load rating as compared to 2.2 for the current edition.					
The load ratings noted in table below, Previously Listed Loads, are consistent with the historical cULus Listings that were evaluated to the requirements of UL 203A, Outline of Investigation for Sway Brace Devices for Fire Sprinkler System Piping, based upon a minimum safety factor of 1.5 in accordance with the earlier editions of NFPA 13. The load ratings based upon the 2016 or earlier editions of NFPA 13 should only be used where approved by the Authority Having Jurisdiction (AHJ).					
Previously Listed UL Loads					
Pipe Size		lbs.	kN	Wt. Each	
				lbs.	kg
8" MAX	(200)	*2015	*(8.96)	2.38	(1.08)
*Load ratings are based on a minimum safety factor of 1.5 in accordance with NFPA 13-2016 Section A.9.3.5.2.3.					

FM Maximum Design Load					
Beam Flange Thickness	Brace Angle From Vertical (Degrees)	X		Y	
		lbs.	kN	lbs.	kN
$\frac{3}{8}$ " MIN - $1\frac{1}{4}$ " MAX	30°-44°	1150	(5.11)	900	(4.00)
	45°-59°	1800	(8.00)	1050	(4.67)
	60°-74°	2230	(9.91)	1260	(5.60)
	75°-90°	2460	(10.94)	1410	(6.27)

When governed by NFPA13 2019 or later, multiply FM approved loads by 0.682.

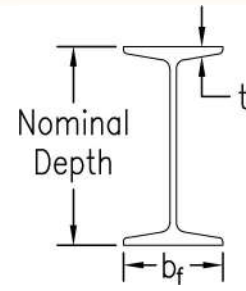
TECHNICAL DATA

STANDARD BEAM INFORMATION



AMERICAN STANDARD 'C' SHAPE CHANNELS

Designation Nom. Depth & Weight		Flange Width b_f		Flange Thickness t_f	
in. X lbs./ft	mm X kg/m				
C3 X 4.1	(C75 X 6.1)	1 ³ / ₈	(35)	.273	(6.9)
C3 X 5	(C75 X 7.4)	1 ¹ / ₂	(37)	.273	(6.9)
C3 X 6	(C75 X 8.9)	1 ⁵ / ₈	(40)	.273	(6.9)
C4 X 5.4	(C100 X 8)	1 ⁹ / ₁₆	(40)	.296	(7.5)
C4 X 7.25	(C100 X 10.8)	1 ³ / ₄	(44)	.296	(7.5)
C5 X 6.7	(C130 X 10)	1 ³ / ₄	(44)	.320	(8.1)
C5 X 9	(C130 X 13.4)	1 ⁷ / ₈	(47)	.320	(8.1)
C6 X 8.2	(C150 X 12.2)	1 ¹⁵ / ₁₆	(48)	.343	(8.7)
C6 X 10.5	(C150 X 15.6)	2	(51)	.343	(8.7)
C6 X 13	(C150 X 19.3)	2 ¹ / ₈	(54)	.343	(8.7)
C7 X 9.8	(C180 X 14.6)	2 ¹ / ₁₆	(53)	.366	(9.3)
C7 X 12.25	(C180 X 18.2)	2 ³ / ₁₆	(55)	.366	(9.3)
C7 X 14.75	(C180 X 22)	2 ¹ / ₄	(57)	.366	(9.3)
C8 X 11.5	(C200 X 17.1)	2 ¹ / ₄	(57)	.390	(9.9)
C8 X 13.75	(C200 X 20.5)	2 ³ / ₈	(59)	.390	(9.9)
C8 X 18.75	(C200 X 27.9)	2 ¹ / ₂	(63)	.390	(9.9)
C9 X 13.4	(C230 X 19.9)	2 ⁷ / ₁₆	(61)	.413	(10.5)
C9 X 15	(C230 X 22)	2 ¹ / ₂	(63)	.413	(10.5)
C9 X 20	(C230 X 30)	2 ⁵ / ₈	(67)	.413	(10.5)
C10 X 15.3	(C250 X 22.8)	2 ⁵ / ₈	(67)	.436	(11.1)
C10 X 20	(C250 X 30)	2 ³ / ₄	(69)	.436	(11.1)
C10 X 25	(C250 X 37)	2 ⁷ / ₈	(73)	.436	(11.1)
C10 X 30	(C250 X 45)	3	(76)	.436	(11.1)
C12 X 20.7	(C310 X 30.8)	2 ¹⁵ / ₁₆	(74)	.501	(12.7)
C12 X 25	(C310 X 37)	3	(76)	.501	(12.7)
C12 X 30	(C310 X 45)	3 ¹ / ₈	(80)	.501	(12.7)
C15 X 33.9	(C380 X 50.4)	3 ³ / ₈	(86)	.650	(16.5)
C15 X 40	(C380 X 60)	3 ¹ / ₂	(89)	.650	(16.5)
C15 X 50	(C380 X 74)	3 ³ / ₄	(94)	.650	(16.5)
C18 X 42.7	(C460 X 63.5)	4	(102)	.625	(15.9)
C18 X 45.8	(C460 X 68.1)	4	(102)	.625	(15.9)
C18 X 51.9	(C460 X 77.2)	4 ¹ / ₈	(106)	.625	(15.9)
C18 X 58	(C460 X 86.3)	4 ¹ / ₄	(112)	.625	(15.9)



AMERICAN STANDARD 'S' SHAPE I-BEAMS

Designation Nom. Depth & Weight		Flange Width b_f		Flange Thickness t_f	
in. X lbs./ft	mm X kg/m				
S3 X 5.7	(S75 X 8.5)	2 ³ / ₈	(59)	.260	(6.6)
S3 X 7.5	(S75 X 11.2)	2 ¹ / ₂	(63)	.260	(6.6)
S4 X 7.7	(S100 X 11.5)	2 ⁵ / ₈	(68)	.293	(7.4)
S4 X 9.5	(S100 X 14.1)	2 ³ / ₄	(71)	.293	(7.4)
S5 X 10	(S130 X 15)	3	(76)	.326	(8.3)
S5 X 14.75	(S130 X 22)	3 ¹ / ₄	(83)	.326	(8.3)
S6 X 12.5	(S150 X 18.6)	3 ³ / ₈	(85)	.359	(9.1)
S6 X 17.25	(S150 X 25.7)	3 ¹¹ / ₁₆	(91)	.359	(9.1)
S7 X 15.3	(S180 X 22.8)	3 ⁵ / ₈	(93)	.392	(10.0)
S7 X 20	(S180 X 29.8)	3 ⁷ / ₈	(98)	.392	(10.0)
S8 X 18.4	(S200 X 27.4)	4	(102)	.425	(10.8)
S8 X 23	(S200 X 34)	4 ¹ / ₈	(106)	.425	(10.8)
S10 X 25.4	(S250 X 37.8)	4 ⁵ / ₈	(118)	.491	(12.5)
S10 X 35	(S250 X 52)	4 ¹⁵ / ₁₆	(126)	.491	(12.5)
S12 X 31.8	(S310 X 47.3)	5	(127)	.544	(13.8)
S12 X 35	(S310 X 52)	5 ¹ / ₁₆	(129)	.544	(13.8)
S12 X 40.8	(S310 X 60.7)	5 ¹ / ₄	(133)	.659	(16.7)
S12 X 50	(S310 X 74)	5 ¹ / ₂	(139)	.659	(16.7)
S15 X 42.9	(S380 X 64)	5 ¹ / ₂	(140)	.622	(15.8)
S15 X 50	(S380 X 74)	5 ⁵ / ₈	(143)	.622	(15.8)
S18 X 54.7	(S460 X 81.4)	6	(152)	.691	(17.6)
S18 X 70	(S460 X 104)	6 ¹ / ₄	(159)	.691	(17.6)
S20 X 66	(S510 X 98.2)	6 ¹ / ₄	(159)	.795	(20.2)
S20 X 75	(S510 X 112)	6 ³ / ₈	(162)	.795	(20.2)
S20 X 86	(S510 X 128)	7 ¹ / ₁₆	(179)	.920	(23.4)
S20 X 96	(S510 X 143)	7 ³ / ₁₆	(183)	.920	(23.4)
S24 X 80	(S610 X 119)	7	(178)	.870	(22.1)
S24 X 90	(S610 X 134)	7 ¹ / ₈	(181)	.870	(22.1)
S24 X 100	(S610 X 149)	7 ¹ / ₄	(184)	.870	(22.1)
S24 X 106	(S610 X 158)	7 ⁷ / ₈	(200)	1.090	(27.7)
S24 X 121	(S610 X 180)	8 ¹ / ₁₆	(204)	1.090	(27.7)

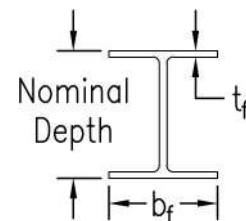
Note: All standard beam information is taken from ASTM A6-86

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

TECHNICAL DATA

STANDARD BEAM INFORMATION

Designation Nom. Depth & Weight		Flange Width b _f		Flange Thickness t _f		Designation Nom. Depth & Weight		Flange Width b _f		Flange Thickness t _f	
in. X lbs./ft.	mm X kg/m					in. X lbs./ft.	mm X kg/m				
W4 X 13	(W100 X 19.3)	4 ¹ / ₁₆	(103)	.345	(8.8)	W12 X 65	(W310 X 97)	12	(305)	.605	(15.4)
W5 X 16	(W130 X 23.8)	5	(127)	.360	(9.1)	W12 X 72	(W310 X 107)	12	(305)	.670	(17.0)
W5 X 19	(W130 X 28.1)	5	(127)	.430	(10.9)	W12 X 79	(W310 X 117)	12 ¹ / ₁₆	(306)	.735	(18.7)
W6 X 9	(W150 X 13.5)	3 ⁵ / ₁₆	(100)	.215	(5.5)	W12 X 87	(W310 X 129)	12 ¹ / ₈	(308)	.810	(20.6)
W6 X 12	(W150 X 18.)	4	(102)	.280	(7.1)	W12 X 96	(W310 X 143)	12 ¹ / ₈	(308)	.900	(22.9)
W6 X 16	(W150 X 24.)	4	(102)	.405	(10.3)	W12 X 106	(W310 X 158)	12 ¹ / ₄	(311)	.990	(25.1)
W6 X 20	(W150 X 29.8)	6	(152)	.365	(9.3)	W12 X 120	(W310 X 179)	12 ⁵ / ₁₆	(313)	1.105	(28.1)
W6 X 25	(W150 X 37.1)	6 ¹ / ₁₆	(154)	.455	(11.6)	W12 X 136	(W310 X 202)	12 ³ / ₈	(314)	1.250	(31.8)
W8 X 10	(W200 X 15.0)	3 ⁵ / ₁₆	(100)	.205	(5.2)	W12 X 152	(W310 X 226)	12 ¹ / ₂	(318)	1.400	(35.6)
W8 X 13	(W200 X 19.3)	4	(102)	.255	(6.5)	W12 X 170	(W310 X 253)	12 ⁵ / ₁₆	(319)	1.560	(39.6)
W8 X 15	(W200 X 22.5)	4	(102)	.315	(8.0)	W12 X 190	(W310 X 283)	12 ¹ / ₁₆	(322)	1.735	(44.1)
W8 X 18	(W200 X 26.6)	5 ¹ / ₄	(133)	.330	(8.4)	W12 X 210	(W310 X 313)	12 ³ / ₄	(324)	1.900	(48.3)
W8 X 21	(W200 X 31.3)	5 ¹ / ₄	(133)	.400	(10.2)	W12 X 230	(W310 X 342)	12 ⁷ / ₈	(327)	2.070	(52.6)
W8 X 24	(W200 X 35.9)	6 ¹ / ₂	(165)	.400	(10.2)	W12 X 252	(W310 X 375)	13	(330)	2.250	(57.2)
W8 X 28	(W200 X 41.7)	6 ¹ / ₂	(165)	.465	(11.8)	W14 X 22	(W360 X 32.9)	5	(127)	.335	(8.5)
W8 X 31	(W200 X 46.1)	8	(203)	.435	(11.0)	W14 X 26	(W360 X 39)	5	(127)	.420	(10.7)
W8 X 35	(W200 X 52)	8	(203)	.495	(12.6)	W14 X 30	(W360 X 44.8)	6 ¹ / ₄	(171)	.385	(9.8)
W8 X 40	(W200 X 59)	8 ¹ / ₁₆	(205)	.560	(14.2)	W14 X 34	(W360 X 51)	6 ¹ / ₄	(171)	.455	(11.6)
W8 X 48	(W200 X 71)	8 ³ / ₈	(206)	.685	(17.4)	W14 X 38	(W360 X 57)	6 ¹ / ₄	(171)	.515	(13.1)
W8 X 58	(W200 X 86)	8 ³ / ₄	(210)	.810	(20.6)	W14 X 43	(W360 X 64)	8	(203)	.530	(13.5)
W8 X 67	(W200 X 100)	8 ³ / ₄	(210)	.935	(23.7)	W14 X 48	(W360 X 72)	8	(203)	.595	(15.1)
W10 X 12	(W250 X 17.9)	4	(102)	.210	(5.3)	W14 X 53	(W360 X 79)	8 ¹ / ₁₆	(205)	.660	(16.8)
W10 X 15	(W250 X 22.3)	4	(102)	.270	(6.9)	W14 X 61	(W360 X 91)	10	(254)	.645	(16.4)
W10 X 17	(W250 X 25.3)	4	(102)	.330	(8.4)	W14 X 68	(W360 X 101)	10	(254)	.720	(18.3)
W10 X 19	(W250 X 28.4)	4	(102)	.395	(10.0)	W14 X 74	(W360 X 110)	10 ¹ / ₁₆	(256)	.785	(19.9)
W10 X 22	(W250 X 32.7)	5 ¹ / ₄	(146)	.360	(9.1)	W14 X 82	(W360 X 122)	10 ³ / ₈	(257)	.855	(21.7)
W10 X 26	(W250 X 38.5)	5 ¹ / ₄	(146)	.440	(11.2)	W14 X 90	(W360 X 134)	14 ¹ / ₂	(368)	.710	(18.0)
W10 X 30	(W250 X 44.8)	5 ³ / ₁₆	(148)	.510	(13.0)	W14 X 99	(W360 X 147)	14 ³ / ₁₆	(370)	.780	(19.8)
W10 X 33	(W250 X 49.1)	7 ⁵ / ₁₆	(202)	.435	(11.0)	W14 X 109	(W360 X 162)	14 ⁵ / ₈	(371)	.860	(21.8)
W10 X 39	(W250 X 58)	8	(203)	.530	(13.5)	W14 X 120	(W360 X 179)	14 ¹ / ₁₆	(373)	.940	(23.9)
W10 X 45	(W250 X 57)	8	(203)	.620	(15.7)	W14 X 132	(W360 X 196)	14 ³ / ₄	(375)	1.030	(26.2)
W10 X 49	(W250 X 73)	10	(254)	.560	(14.2)	W14 X 145	(W360 X 216)	15 ¹ / ₂	(394)	1.090	(27.7)
W10 X 54	(W250 X 80)	10 ¹ / ₁₆	(256)	.615	(15.6)	W14 X 159	(W360 X 237)	15 ³ / ₁₆	(395)	1.190	(30.2)
W10 X 60	(W250 X 89)	10 ¹ / ₁₆	(256)	.680	(17.3)	W14 X 176	(W360 X 262)	15 ⁵ / ₈	(397)	1.310	(33.3)
W10 X 68	(W250 X 101)	10 ³ / ₈	(257)	.770	(19.6)	W14 X 193	(W360 X 287)	15 ³ / ₄	(400)	1.440	(36.6)
W10 X 77	(W250 X 115)	10 ¹ / ₁₆	(259)	.870	(22.1)	W14 X 211	(W360 X 314)	15 ³ / ₄	(400)	1.560	(39.6)
W10 X 88	(W250 X 131)	10 ¹ / ₄	(260)	.990	(25.1)	W14 X 233	(W360 X 347)	15 ⁵ / ₈	(403)	1.720	(43.7)
W10 X 100	(W250 X 149)	10 ³ / ₈	(264)	1.120	(28.4)	W14 X 257	(W360 X 382)	16	(406)	1.890	(48.0)
W10 X 112	(W250 X 167)	10 ⁷ / ₁₆	(265)	1.250	(31.8)	W14 X 283	(W360 X 421)	16 ³ / ₈	(410)	2.070	(52.6)
W12 X 14	(W310 X 21)	4	(102)	.225	(5.7)	W14 X 311	(W360 X 463)	16 ¹ / ₄	(413)	2.260	(57.4)
W12 X 16	(W310 X 23.8)	4	(102)	.265	(6.7)	W14 X 342	(W360 X 509)	16 ³ / ₈	(416)	2.470	(62.7)
W12 X 19	(W310 X 28.3)	4	(102)	.350	(8.9)	W14 X 370	(W360 X 551)	16 ¹ / ₂	(419)	2.660	(67.6)
W12 X 22	(W310 X 32.7)	4	(102)	.425	(10.8)	W14 X 398	(W360 X 592)	16 ³ / ₁₆	(421)	2.845	(72.3)
W12 X 26	(W310 X 38.7)	6 ¹ / ₂	(165)	.380	(9.7)	W14 X 426	(W360 X 634)	16 ¹ / ₁₆	(424)	3.035	(77.1)
W12 X 30	(W310 X 44.5)	6 ¹ / ₂	(165)	.440	(11.2)	W16 X 26	(W410 X 38.8)	5 ¹ / ₂	(140)	.345	(8.8)
W12 X 35	(W310 X 52)	6 ³ / ₁₆	(167)	.520	(13.2)	W16 X 31	(W410 X 46.1)	5 ¹ / ₂	(140)	.440	(11.2)
W12 X 40	(W310 X 60)	8	(203)	.515	(13.1)	W16 X 36	(W410 X 53)	7	(178)	.430	(10.9)
W12 X 45	(W310 X 67)	8 ¹ / ₁₆	(205)	.575	(14.6)	W16 X 40	(W410 X 60)	7	(178)	.505	(12.8)
W12 X 50	(W310 X 74)	8 ¹ / ₁₆	(205)	.640	(16.3)	W16 X 45	(W410 X 67)	7	(178)	.565	(14.4)
W12 X 53	(W310 X 79)	10	(254)	.575	(14.6)	W16 X 50	(W410 X 75)	7 ¹ / ₁₆	(179)	.630	(16.0)
W12 X 58	(W310 X 86)	10	(254)	.640	(16.3)	W16 X 57	(W410 X 85)	7 ³ / ₈	(181)	.715	(18.2)



WIDE FLANGE I-BEAMS

Designation Nom. Depth & Weight		Flange Width b _f		Flange Thickness t _f	
in. X lbs./ft.	mm X kg/m				
W16 X 67	(W410 X 100)	10 ¹ / ₄	(260)	.665	(16.9)
W16 X 77	(W410 X 114)	10 ⁵ / ₁₆	(262)	.760	(19.3)
W16 X 89	(W410 X 132)	10 ³ / ₈	(264)	.875	(22.2)
W16 X 100	(W410 X 149)	10 ⁷ / ₁₆	(265)	.985	(25.0)
W18 X 35	(W460 X 52)	6	(152)	.425	(10.8)
W18 X 40	(W460 X 60)	6	(152)	.525	(13.3)
W18 X 46	(W460 X 68)	6 ¹ / ₁₆	(154)	.605	(15.4)
W18 X 50	(W460 X 74)	7 ¹ / ₂	(191)	.570	(14.5)
W18 X 55	(W460 X 82)	7 ¹ / ₂	(191)	.630	(16.0)
W18 X 60	(W460 X 89)	7 ³ / ₁₆	(192)	.695	(17.7)
W18 X 65	(W460 X 97)	7 ³ / ₁₆	(192)	.750	(19.1)
W18 X 71	(W460 X 106)	7 ⁵ / ₈	(194)	.810	(20.6)
W18 X 76	(W460 X 113)	11	(279)	.680	(17.3)
W18 X 86	(W460 X 128)	11 ¹ / ₁₆	(281)	.770	(19.6)
W18 X 97	(W460 X 144)	11 ¹ / ₈	(283)	.870	(22.1)
W18 X 106	(W460 X 158)	11 ³ / ₁₆	(284)	.940	(23.9)
W18 X 119	(W460 X 177)	11 ¹ / ₄	(286)	1.060	(26.9)
W21 X 44	(W530 X 66)	6 ¹ / ₂	(165)	.450	(11.4)
W21 X 50	(W530 X 74)	6 ¹ / ₂	(165)	.535	(13.6)
W21 X 57	(W530 X 85)	6 ³ / ₁₆	(167)	.650	(16.5)
W21 X 62	(W530 X 92)	8 ¹ / ₄	(210)	.615	(15.6)
W21 X 68	(W530 X 101)	8 ¹ / ₄	(210)	.685	(17.4)
W21 X 73	(W530 X 109)	8 ¹ / ₄	(210)	.740	(18.8)
W21 X 83	(W530 X 123)	8 ³ / ₈	(225)	.835	(21.2)
W21 X 93	(W530 X 138)	8 ¹ / ₁₆	(214)	.930	(23.6)
W21 X 101	(W530 X 150)	12 ¹ / ₄	(311)	.800	(20.3)
W21 X 111	(W530 X 165)	12 ³ / ₈	(314)	.875	(22.2)
W21 X 122	(W530 X 182)	12 ⁵ / ₈	(316)	.960	(24.4)
W21 X 132	(W530 X 196)	12 ⁷ / ₁₆	(316)	1.035	(26.3)
W21 X 147	(W530 X 219)	12 ¹ / ₂	(318)	1.150	(29.2)
W24 X 55	(W610 X 82)	7	(178)	.505	(12.8)
W24 X 62	(W610 X 92)	7 ¹ / ₁₆	(179)	.590	(15.0)
W24 X 68	(W610 X 101)	8 ³ / ₁₆	(227)	.585	(14.9)
W24 X 76	(W610 X 113)	9	(229)	.680	(17.3)
W24 X 84	(W610 X 125)	9	(229)	.770	(19.6)
W24 X 94	(W610 X 140)	9 ¹ / ₁₆	(230)	.875	(22.2)
W24 X 104	(W610 X 155)	12 ¹ / ₄	(324)	.750	(19.1)
W24 X 117	(W610 X 174)	12 ³ / ₄	(324)	.850	(21.6)
W24 X 131	(W610 X 195)	12 ⁷ / ₈	(327)	.960	(24.4)
W24 X 146	(W610 X 217)	12 ⁵ / ₈	(327)	1.090	(27.7)
W24 X 162	(W610 X 241)	12 ⁵ / ₁₆	(329)	1.220	(31.0)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

TECHNICAL DATA



STEEL PIPE DATA

Pipe Size		Schedule No.	O.D.		Wall Thickness		Weight				Pipe Size	Schedule No.	O.D.		Wall Thickness		Weight			
							Water		Pipe								Water		Pipe	
							lbs./ft	kg/m	lbs./ft	kg/m							lbs./ft	kg/m	lbs./ft	kg/m
3/8	(10)	10	0.675	(17.15)	.066	(1.68)	0.100	(0.15)	0.4325	(0.64)	5	(125)	5.563	(141.30)	0.134	(3.40)	9.55	(14.21)	7.77	(11.56)
		40			.091	(2.31)	0.083	(0.12)	0.567	(0.84)					0.258	(6.55)	8.67	(12.91)	14.62	(21.76)
		80			.126	(3.20)	0.061	(0.09)	0.738	(1.10)					0.375	(9.53)	7.89	(11.74)	20.78	(30.92)
1/2	(15)	10	0.84	(21.34)	.083	(2.11)	0.155	(0.23)	0.671	(1.00)	6	(150)	6.625	(168.28)	0.134	(3.40)	13.76	(20.48)	9.289	(13.82)
		40			.109	(2.77)	0.132	(0.20)	0.85	(1.26)					0.28	(7.11)	12.52	(18.64)	18.97	(28.23)
		80			.147	(3.73)	0.102	(0.15)	1.087	(1.62)					0.432	(10.97)	11.30	(16.82)	28.57	(42.52)
3/4	(20)	10	1.05	(26.67)	.083	(2.11)	0.266	(0.40)	0.8572	(1.28)	8	(200)	8.625	(219.08)	0.148	(3.76)	23.62	(35.15)	13.4	(19.94)
		40			.113	(2.87)	0.231	(0.34)	1.13	(1.68)					0.322	(8.18)	21.69	(32.28)	28.55	(42.49)
		80			.154	(3.91)	0.187	(0.28)	1.473	(2.19)					0.5	(12.70)	19.80	(29.46)	43.39	(64.57)
1	(25)	10	1.315	(33.40)	.109	(2.77)	0.410	(0.61)	1.404	(2.09)	10	(250)	10.75	(273.05)	0.165	(4.19)	36.97	(55.02)	18.7	(27.83)
		40			.133	(3.38)	0.375	(0.56)	1.678	(2.50)					0.365	(9.27)	34.19	(50.87)	40.48	(60.24)
		80			.179	(4.55)	0.312	(0.46)	2.171	(3.23)					0.593	(15.06)	31.14	(46.35)	64.4	(95.84)
1 1/4	(32)	10	1.66	(42.16)	.109	(2.77)	0.708	(1.05)	1.806	(2.69)	12	(300)	12.75	(323.85)	0.18	(4.57)	52.27	(77.79)	24.2	(36.01)
		40			.14	(3.56)	0.648	(0.96)	2.272	(3.38)					0.406	(10.31)	48.53	(72.21)	53.6	(79.77)
		80			.191	(4.85)	0.556	(0.83)	2.996	(4.46)					0.687	(17.45)	44.06	(65.57)	88.6	(131.85)
1 1/2	(40)	10	1.9	(48.26)	.109	(2.77)	0.963	(1.43)	2.085	(3.10)	14	(350)	14	(355.60)	0.25	(6.35)	62.05	(92.35)	36.71	(54.63)
		40			.145	(3.68)	0.883	(1.31)	2.717	(4.04)					0.437	(11.10)	58.66	(87.30)	63	(93.75)
		80			.2	(5.08)	0.766	(1.14)	3.631	(5.40)					0.75	(19.05)	53.20	(79.17)	107	(159.23)
2	(50)	10	2.375	(60.33)	.109	(2.77)	1.584	(2.36)	2.638	(3.93)	16	(400)	16	(406.40)	0.25	(6.35)	81.80	(121.74)	42.05	(62.58)
		40			.154	(3.91)	1.455	(2.16)	3.652	(5.43)					0.5	(12.70)	76.61	(114.01)	83	(123.52)
		80			.218	(5.54)	1.280	(1.91)	5.022	(7.47)					0.843	(21.41)	69.76	(103.82)	137	(203.88)
2 1/2	(65)	10	2.875	(73.03)	.12	(3.05)	2.364	(3.52)	3.531	(5.25)	18	(450)	18	(457.20)	0.25	(6.35)	104.27	(155.18)	47.39	(70.52)
		40			.203	(5.16)	2.076	(3.09)	5.79	(8.62)					0.563	(14.30)	96.95	(144.27)	105	(156.26)
		80			.276	(7.01)	1.837	(2.73)	7.66	(11.40)					0.937	(23.80)	88.54	(131.77)	171	(254.48)
3	(80)	10	3.5	(88.90)	.12	(3.05)	3.619	(5.39)	4.332	(6.45)	20	(500)	20	(508.00)	0.25	(6.35)	129.47	(192.67)	62.73	(93.35)
		40			.216	(5.49)	3.205	(4.77)	7.57	(11.27)					0.593	(15.06)	120.52	(179.36)	123	(183.04)
		80			.3	(7.62)	2.864	(4.26)	10.25	(15.25)					1.031	(26.19)	109.56	(163.04)	209	(311.03)
3 1/2	(90)	10	4	(101.60)	.12	(3.05)	4.814	(7.16)	4.973	(7.40)	24	(600)	24	(609.60)	0.25	(6.35)	188.04	(279.83)	63.41	(94.36)
		40			.226	(5.74)	4.286	(6.38)	9.11	(13.56)					0.687	(17.45)	174.31	(259.40)	171	(254.48)
		80			.318	(8.08)	3.853	(5.73)	12.51	(18.62)					1.218	(30.94)	158.33	(235.62)	297	(441.98)
4	(100)	10	4.5	(114.30)	.12	(3.05)	6.179	(9.20)	5.613	(8.35)	30	(750)	30	(762.00)	.5	(12.70)	286.00	(425.61)	158	(235.13)
		40			.237	(6.02)	5.519	(8.21)	10.79	(16.06)					.5	(12.70)	417.00	(620.56)	190	(282.75)
		80			.337	(8.56)	4.984	(7.42)	14.98	(22.29)										

SPACING OF HANGERS FOR STEEL PIPE

Nominal Pipe Size	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5	6	8	10	12	14	16	18	20	24
	(15)	(20)	(25)	(32)	(40)	(50)	(65)	(80)	(90)	(100)	(125)	(150)	(200)	(250)	(300)	(350)	(400)	(450)	(500)	(600)
Max. Span	7	7	7	7	9	10	11	12	13	14	16	17	19	22	23	25	27	28	30	32
	(2.13)	(2.13)	(2.13)	(2.13)	(2.74)	(3.05)	(3.35)	(3.66)	(3.96)	(4.27)	(4.88)	(5.18)	(5.79)	(6.71)	(7.01)	(7.62)	(8.23)	(8.53)	(9.14)	(9.75)
Recommended Hanger Rod Size	3/8	3/8	3/8	3/8	3/8	3/8	1/2	1/2	1/2	5/8	5/8	3/4	3/4	7/8	7/8	1	1	1	1 1/4	1 1/4
																				OR TRAPEZE

Note: Spacing and capacities are based on pipe filled with water. Additional valves and fittings increase the load and therefore closer hanger spacing is required. Taken from ANSI/MSS SP-58.

***Many Codes and specifications require pipe hangers to be spaced every 10 ft (3.05m) regardless of size. Check local codes.**

TECHNICAL DATA

COPPER TUBE DATA

TYPE L

Tube Size	Tubing O.D.	Wall Thickness	Weight			
			Water		Pipe	
			lbs./ft	kg/m	lbs./ft	kg/m
1/4 (6)	.375 (9.53)	.030 (0.76)	.034 (0.051)	.126 (1.88)		
3/8 (10)	.500 (12.70)	.035 (0.89)	.062 (0.092)	.198 (2.95)		
1/2 (15)	.625 (15.88)	.040 (1.02)	.100 (0.149)	.285 (4.24)		
5/8 (17)	.750 (19.05)	.042 (1.07)	.151 (0.225)	.362 (5.39)		
3/4 (20)	.875 (22.23)	.045 (1.14)	.209 (0.311)	.455 (6.77)		
1 (25)	1.125 (28.58)	.050 (1.27)	.357 (0.531)	.655 (9.75)		
1 1/4 (32)	1.375 (34.93)	.055 (1.40)	.546 (0.813)	.884 (1.316)		
1 1/2 (40)	1.625 (41.28)	.060 (1.52)	.767 (1.141)	1.140 (1.697)		
2 (50)	2.125 (53.98)	.070 (1.78)	1.341 (1.996)	1.750 (2.604)		
2 1/2 (65)	2.625 (66.68)	.080 (2.03)	2.064 (3.072)	2.480 (3.691)		
3 (80)	3.125 (79.38)	.090 (2.29)	2.949 (4.389)	3.330 (4.956)		
3 1/2 (90)	3.625 (92.08)	.100 (2.54)	3.989 (5.936)	4.290 (6.384)		
4 (100)	4.125 (104.78)	.110 (2.79)	5.188 (7.721)	5.380 (8.006)		
5 (125)	5.125 (130.18)	.125 (3.18)	8.081 (12.026)	7.610 (11.325)		
6 (150)	6.125 (155.58)	.140 (3.56)	11.616 (17.287)	10.200 (15.179)		
8 (200)	8.125 (206.38)	.200 (5.08)	20.289 (30.193)	19.260 (28.662)		
10 (250)	10.125 (257.18)	.250 (6.35)	31.590 (47.011)	30.100 (44.794)		
12 (300)	12.125 (307.98)	.280 (7.11)	45.426 (67.601)	40.400 (60.122)		

TYPE K

Tube Size	Tubing O.D.	Wall Thickness	Weight			
			Water		Pipe	
			lbs./ft	kg/m	lbs./ft	kg/m
1/4 (6)	.375 (9.53)	.035 (0.89)	.032 (0.048)	.145 (2.16)		
3/8 (10)	.500 (12.70)	.049 (1.24)	.055 (0.082)	.269 (4.00)		
1/2 (15)	.625 (15.88)	.049 (1.24)	.094 (0.140)	.344 (5.12)		
5/8 (17)	.750 (19.05)	.049 (1.24)	.144 (0.214)	.418 (6.22)		
3/4 (20)	.875 (22.23)	.065 (1.65)	.188 (0.280)	.641 (0.954)		
1 (25)	1.125 (28.58)	.065 (1.65)	.337 (0.502)	.839 (1.249)		
1 1/4 (32)	1.375 (34.93)	.065 (1.65)	.527 (0.784)	1.040 (1.548)		
1 1/2 (40)	1.625 (41.28)	.072 (1.83)	.743 (1.106)	1.360 (2.024)		
2 (50)	2.125 (53.98)	.083 (2.11)	1.310 (1.949)	2.060 (3.066)		
2 1/2 (65)	2.625 (66.68)	.095 (2.41)	2.000 (2.976)	2.920 (4.345)		
3 (80)	3.125 (79.38)	.109 (2.77)	2.960 (4.405)	4.000 (5.953)		
3 1/2 (90)	3.625 (92.08)	.120 (3.05)	3.900 (5.804)	5.120 (7.619)		
4 (100)	4.125 (104.78)	.134 (3.40)	5.060 (7.530)	6.510 (9.688)		
5 (125)	5.125 (130.18)	.160 (4.06)	8.000 (11.905)	9.670 (14.391)		
6 (150)	6.125 (155.58)	.192 (4.88)	11.200 (16.667)	13.870 (20.641)		
8 (200)	8.125 (206.38)	.271 (6.88)	19.500 (29.019)	25.900 (38.543)		
10 (250)	10.125 (257.18)	.338 (8.59)	30.423 (45.274)	40.300 (59.973)		
12 (300)	12.125 (307.98)	.405 (10.29)	43.675 (64.996)	57.800 (86.016)		

SPACING OF HANGERS FOR COPPER TUBING

Tubing Size		1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5	6	8	10	12
		(15)	(20)	(25)	(32)	(40)	(50)	(65)	(80)	(90)	(100)	(125)	(150)	(200)	(250)	(300)
Span	ft	5	5	6	7	8	8	9	10	11	12	13	14	16	18	19
	m	(1.5)	(1.5)	(1.8)	(2.1)	(2.4)	(2.4)	(2.7)	(3.0)	(3.4)	(3.7)	(4.0)	(4.3)	(4.9)	(5.5)	(5.8)

Note: Spacing and capacities are based on pipe filled with water. Additional valves and fittings increase the load and therefore closer hanger spacing is required. Taken from ANSI/MSS SP-58.

AWWA DUCTILE IRON PIPE DATA

Nominal Pipe Size	Class	O.D. D.I. Pipe	Wall Thick	Weight			
				Pipe		Water	
				lbs./ft	kg/m	lbs./ft	kg/m
3 (80)	53	3.96 (100.58)	.31 (7.87)	11.2 (16.67)	3.8 (5.66)		
4 (100)	53	4.80 (121.92)	.32 (8.13)	14.2 (21.13)	5.9 (8.78)		
6 (150)	53	6.90 (175.26)	.34 (8.64)	22.0 (32.74)	13.1 (19.49)		
8 (200)	53	9.05 (229.87)	.36 (9.14)	31.0 (46.13)	23.0 (34.23)		
10 (250)	53	11.1 (281.94)	.38 (9.65)	40.4 (60.12)	36.4 (54.17)		
12 (300)	53	13.2 (335.28)	.40 (10.16)	50.7 (75.45)	52.3 (77.83)		
14 (350)	53	15.3 (388.62)	.42 (10.67)	62.4 (92.86)	71.1 (105.81)		
16 (400)	53	17.4 (441.96)	.43 (10.92)	72.8 (108.34)	93.1 (138.55)		
18 (450)	53	19.5 (495.30)	.44 (11.18)	83.6 (124.41)	117.9 (175.45)		
20 (500)	53	21.6 (548.64)	.45 (11.43)	95.2 (141.67)	145.8 (216.97)		
24 (600)	53	25.8 (655.32)	.47 (11.94)	119.2 (177.39)	210.2 (312.81)		
30 (750)	53	32.0 (812.80)	.51 (12.95)	161.3 (240.04)	326.5 (485.89)		
36 (900)	53	38.3 (972.82)	.58 (14.73)	219.5 (326.65)	469.3 (698.40)		
42 (1050)	53	44.5 (1130.30)	.65 (16.51)	285.2 (424.42)	634.9 (944.84)		
48 (1200)	53	50.8 (1290.32)	.72 (18.29)	360.3 (536.19)	828.9 (1233.54)		

Based on AWWA C108-70, Table 8.2.

Add flange weight for flanged cast iron pipe.

GLASS PIPE DATA

REGULAR SCHEDULE

Nominal Pipe Size	O.D. D.I. Pipe	Wall Thick	Weight			
			Pipe		Water	
			lbs./ft	kg/m	lbs./ft	kg/m
1 1/2 (40)	1.84 (46.74)	.12 (3.05)	.64 (0.95)	.89 (1.32)		
2 (50)	2.34 (59.44)	.14 (3.56)	.94 (1.40)	1.45 (2.16)		
3 (80)	3.41 (86.61)	.17 (4.32)	1.60 (2.38)	3.19 (4.75)		
4 (100)	4.53 (115.06)	.20 (5.08)	2.60 (3.87)	5.79 (8.62)		
6 (150)	6.66 (169.16)	.24 (6.10)	4.70 (6.99)	12.78 (19.02)		

HEAVY SCHEDULE

1 (25)	1.31 (33.27)	.16 (4.06)	.60 (0.89)	.35 (0.52)		
1 1/2 (40)	1.84 (46.74)	.17 (4.32)	.87 (1.29)	.76 (1.13)		
2 (50)	2.34 (59.44)	.17 (4.32)	1.10 (1.64)	1.36 (2.02)		
3 (80)	3.41 (86.61)	.20 (5.08)	2.00 (2.98)	3.06 (4.55)		
4 (100)	4.53 (115.06)	.26 (6.60)	3.40 (5.06)	5.44 (8.10)		
6 (150)	6.66 (169.16)	.33 (8.38)	6.30 (9.38)	12.42 (18.48)		

Spacing of Hangers for glass pipe support every 8-10 ft (2.44 - 3.05 m). Pad all hangers. Use only clevis or trapeze, do not tie down pipe.

TECHNICAL DATA



PVC PLASTIC PIPE DATA

Pipe Size		Sch. No.	O.D.		Wall Thickness		Weight				Pipe Size		Sch. No.	O.D.		Wall Thickness		Weight			
							Water		Pipe									Water		Pipe	
							lbs./ft	kg/m	lbs./ft	kg/m								lbs./ft	kg/m	lbs./ft	kg/m
1/8	(3)	40	.405	(10.3)	.068	(1.73)	.025	(.037)	.043	(.064)	2 1/2	(65)	40	2.875	(73.03)	.203	(5.16)	2.072	(3.08)	1.020	(1.518)
		80			.095	(2.41)	.016	(.024)	.055	(.082)			.276			(7.01)	1.834	(2.73)	1.350	(2.009)	
1/4	(6)	40	.540	(13.7)	.088	(2.24)	.045	(.067)	.074	(.110)	3	(80)	40	3.500	(88.9)	.216	(5.49)	3.20	(4.76)	1.333	(1.984)
		80			.119	(3.02)	.031	(.046)	.094	(.140)			.300			(7.62)	2.86	(4.26)	1.804	(2.685)	
3/8	(10)	40	.675	(17.15)	.091	(2.31)	.083	(.124)	.100	(.149)	3 1/2	(90)	40	4.000	(101.6)	.226	(5.74)	4.28	(6.37)	1.598	(2.378)
		80			.126	(3.20)	.061	(.091)	.129	(.192)			.318			(8.08)	3.85	(5.73)	2.195	(3.267)	
1/2	(15)	40	.840	(21.34)	.109	(2.77)	.132	(.196)	.150	(.223)	4	(100)	40	4.500	(114.3)	.237	(6.02)	5.51	(8.20)	1.899	(2.826)
		80			.147	(3.73)	.101	(.150)	.200	(.298)			.337			(8.56)	4.98	(7.41)	2.636	(3.923)	
3/4	(20)	40	1.050	(26.67)	.113	(2.87)	.230	(.342)	.199	(.296)	5	(125)	40	5.563	(141.30)	.258	(6.55)	8.66	(12.89)	2.770	(4.122)
		80			.154	(3.91)	.186	(.277)	.259	(.385)			.375			(9.53)	7.87	(11.71)	4.126	(6.140)	
1	(25)	40	1.315	(33.40)	.133	(3.38)	.374	(.557)	.295	(.439)	6	(150)	40	6.625	(168.28)	.280	(7.11)	12.51	(18.62)	3.339	(4.969)
		80			.179	(4.55)	.311	(.463)	.382	(.568)			.432			(10.97)	11.92	(17.74)	5.028	(7.482)	
1 1/4	(32)	40	1.660	(42.16)	.140	(3.56)	.647	(.963)	.400	(.595)	8	(200)	40	8.625	(219.08)	.322	(8.18)	21.60	(32.14)	5.280	(7.858)
		80			.191	(4.85)	.555	(.826)	.527	(.784)			.500			(12.70)	19.80	(29.47)	8.023	(11.940)	
1 1/2	(40)	40	1.900	(48.26)	.145	(3.68)	.882	(1.313)	.479	(.713)	10	(250)	40	10.75	(273.05)	.365	(9.27)	34.10	(50.75)	7.505	(11.169)
		80			.200	(5.08)	.765	(1.138)	.639	(.951)			.593			(15.06)	31.10	(46.28)	11.894	(17.700)	
2	(50)	40	2.375	(60.33)	.154	(3.91)	1.452	(2.161)	.643	(.957)	12	(300)	40	12.75	(323.85)	.406	(10.31)	48.50	(72.18)	10.023	(14.916)
		80			.218	(5.54)	1.279	(1.903)	.884	(1.316)			.687			(17.45)	44.00	(65.48)	16.365	(24.354)	

SPACING OF HANGERS FOR PVC PLASTIC PIPE

Schedule 40 Pipe Size	Support Spacing																			
	Temperature																			
	20°F (-6.6°C)		40°F (4.4°C)		60°F (15.6°C)		80°F (26.7°C)		100°F (37.8°C)		110°F (43.3°C)		120°F (48.9°C)		130°F (54.4°C)		140°F (60°C)		150°F (65.6°C)	
	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m
1/2 - 3/4 (15-20)	5.00 (1.52)	4.75 (1.45)	4.50 (1.37)	4.25 (1.30)	4.00 (1.22)	3.75 (1.14)	3.33 (1.01)	3.00 (.91)	2.66 (.81)	2.00 (.61)										
1 - 1 1/4 (25-32)	5.50 (1.68)	5.25 (1.60)	5.00 (1.52)	4.66 (1.42)	4.33 (1.32)	4.00 (1.22)	3.75 (1.14)	3.33 (1.01)	2.80 (.85)	2.25 (.69)										
1 1/2 - 2 (40-50)	5.80 (1.77)	5.50 (1.68)	5.25 (1.60)	5.00 (1.52)	4.66 (1.42)	4.33 (1.32)	3.80 (1.16)	3.50 (1.07)	3.00 (.91)	2.50 (.76)										
2 1/2 (65)	6.66 (2.03)	6.33 (1.93)	6.00 (1.83)	5.50 (1.68)	5.25 (1.60)	4.80 (1.46)	4.50 (1.37)	4.00 (1.22)	3.50 (1.07)	2.80 (.85)										
3 (80)	6.80 (2.07)	6.50 (1.98)	6.25 (1.91)	5.80 (1.77)	5.50 (1.68)	5.25 (1.60)	4.75 (1.45)	4.25 (1.30)	3.66 (1.12)	3.00 (.91)										
4 (100)	7.33 (2.23)	7.00 (2.13)	6.50 (1.98)	6.25 (1.91)	5.80 (1.77)	5.50 (1.68)	5.00 (1.52)	4.50 (1.37)	3.80 (1.16)	3.25 (.99)										
6 (150)	7.80 (2.38)	7.50 (2.29)	7.00 (2.13)	6.80 (2.07)	6.33 (1.93)	5.80 (1.77)	5.33 (1.62)	4.80 (1.46)	4.25 (1.30)	3.50 (1.07)										

Schedule 80 Pipe Size	Support Spacing																			
	Temperature																			
	20°F (-6.6°C)		40°F (4.4°C)		60°F (15.6°C)		80°F (26.7°C)		100°F (37.8°C)		110°F (43.3°C)		120°F (48.9°C)		130°F (54.4°C)		140°F (60°C)		150°F (65.6°C)	
	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m
1/2 - 3/4 (15-20)	5.75 (1.75)	5.50 (1.68)	5.25 (1.60)	4.80 (1.46)	4.50 (1.37)	4.33 (1.32)	3.80 (1.16)	3.50 (1.07)	3.00 (.91)	2.50 (.76)										
1 (25)	6.33 (1.93)	6.00 (1.83)	5.75 (1.75)	5.33 (1.62)	5.00 (1.52)	4.60 (1.40)	4.33 (1.32)	3.80 (1.16)	3.33 (1.01)	2.75 (.84)										
1 1/4 - 1 1/2 (32-40)	6.66 (2.03)	6.33 (1.93)	6.00 (1.83)	5.66 (1.73)	5.25 (1.60)	4.80 (1.46)	4.50 (1.37)	4.00 (1.22)	3.50 (1.07)	3.00 (.91)										
2 (50)	7.00 (2.13)	6.50 (1.98)	6.25 (1.91)	6.00 (1.83)	5.50 (1.68)	5.12 (1.56)	4.75 (1.45)	4.33 (1.32)	3.66 (1.12)	3.12 (.95)										
2 1/2 (65)	7.80 (2.38)	7.50 (2.29)	7.00 (2.13)	6.66 (2.03)	6.33 (1.93)	5.80 (1.77)	5.33 (1.62)	4.75 (1.45)	4.25 (1.30)	3.33 (1.01)										
3 (80)	8.20 (2.50)	7.75 (2.36)	7.33 (2.23)	7.00 (2.13)	6.50 (1.98)	6.00 (1.83)	5.50 (1.68)	5.00 (1.52)	4.33 (1.32)	3.50 (1.07)										
4 (100)	8.66 (2.64)	8.25 (2.51)	7.80 (2.38)	7.33 (2.23)	6.80 (2.07)	6.33 (1.93)	5.80 (1.77)	5.25 (1.60)	4.66 (1.42)	3.75 (1.14)										
6 (150)	9.80 (2.99)	9.33 (2.84)	8.80 (2.68)	8.33 (2.54)	7.80 (2.38)	7.33 (2.23)	6.50 (1.98)	6.00 (1.83)	5.12 (1.56)	4.25 (1.30)										

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

TECHNICAL DATA

CONDUIT DATA

ELECTRICAL METALLIC TUBING DATA

Nominal Size EMT Conduit		O.D. Conduit		Weight Conduit W/C Plg.		Approx. Max. Weight Conduit And Conductor	
						Not Lead Covered	
				lbs./ft	kg/m	lbs./ft	kg/m
1/2	(15)	.706	(17.93)	.29	(0.43)	.54	(0.80)
3/4	(20)	.922	(23.42)	.45	(0.67)	1.16	(1.73)
1	(25)	1.163	(29.54)	.65	(0.97)	1.83	(2.72)
1 1/4	(32)	1.510	(38.35)	.96	(1.43)	2.96	(4.40)
1 1/2	(40)	1.740	(44.20)	1.11	(1.65)	3.68	(5.48)
2	(50)	2.197	(55.80)	1.41	(2.10)	4.45	(6.62)
2 1/2	(65)	2.875	(73.03)	2.15	(3.20)	6.41	(9.54)
3	(80)	3.500	(88.90)	2.60	(3.87)	9.30	(13.84)
3 1/2	(90)	4.000	(101.60)	3.25	(4.84)	12.15	(18.08)
4	(100)	4.500	(114.30)	3.90	(5.80)	15.40	(22.92)

Note: 2 1/2" through 4" EMT is the same as steel rigid conduit

STEEL RIGID CONDUIT DATA

Nominal Size EMT Conduit		O.D. Conduit		O.D. Coupling		Weight Conduit W/C Plg.		Approx. Max. Weight Conduit And Conductor			
								Lead Covered		Not Lead Covered	
						lbs./ft	kg/m	lbs./ft	kg/m	lbs./ft	kg/m
1/2	(15)	.840	(21.34)	1.010	(25.65)	.80	(1.19)	1.17	(1.74)	1.04	(1.55)
3/4	(20)	1.050	(26.67)	1.250	(31.75)	1.09	(1.62)	1.75	(2.60)	1.40	(2.08)
1	(25)	1.315	(33.40)	1.525	(38.74)	1.65	(2.46)	2.62	(3.90)	2.35	(3.50)
1 1/4	(32)	1.660	(42.16)	1.869	(47.47)	2.15	(3.20)	4.31	(6.41)	3.58	(5.33)
1 1/2	(40)	1.900	(48.26)	2.155	(54.74)	2.58	(3.84)	5.89	(8.77)	4.55	(6.77)
2	(50)	2.375	(60.33)	2.650	(67.31)	3.52	(5.24)	8.53	(12.69)	7.21	(10.73)
2 1/2	(65)	2.875	(73.03)	3.250	(82.55)	5.67	(8.44)	11.51	(17.13)	10.22	(15.21)
3	(80)	3.500	(88.90)	3.870	(98.30)	7.14	(10.63)	16.51	(24.57)	14.51	(21.59)
3 1/2	(90)	4.000	(101.60)	4.500	(114.30)	8.60	(12.80)	19.05	(28.35)	17.49	(26.03)
4	(100)	4.500	(114.30)	4.875	(123.83)	10.00	(14.88)	24.75	(36.83)	21.48	(31.97)
5	(125)	5.563	(141.30)	6.000	(152.40)	13.20	(19.64)	35.87	(53.38)	30.83	(45.88)
6	(150)	6.625	(168.28)	7.200	(182.88)	17.85	(26.56)	50.69	(75.44)	43.43	(64.63)

INTERMEDIATE METAL CONDUIT DATA

Nominal Size EMT Conduit		O.D. Conduit		O.D. Coupling		Weight Conduit W/C Plg.		Approx. Max. Weight Conduit And Conductor			
								Lead Covered		Not Lead Covered	
						lbs./ft	kg/m	lbs./ft	kg/m	lbs./ft	kg/m
1/2	(15)	.815	(20.70)	1.010	(25.65)	.60	(0.89)	.97	(1.44)	.84	(1.25)
3/4	(20)	1.029	(26.14)	1.250	(31.75)	.82	(1.22)	1.48	(2.20)	1.13	(1.68)
1	(25)	1.290	(32.77)	1.525	(38.74)	1.16	(1.73)	2.13	(3.17)	1.86	(2.77)
1 1/4	(32)	1.638	(41.61)	1.869	(47.47)	1.50	(2.23)	3.66	(5.45)	2.93	(4.36)
1 1/2	(40)	1.883	(47.83)	2.155	(54.74)	1.82	(2.71)	5.13	(7.63)	3.79	(5.64)
2	(50)	2.360	(59.94)	2.650	(67.31)	2.42	(3.60)	7.43	(11.06)	6.11	(9.09)
2 1/2	(65)	2.857	(72.57)	3.250	(82.55)	4.28	(6.37)	10.12	(15.06)	8.83	(13.14)
3	(80)	3.476	(88.29)	3.870	(98.30)	5.26	(7.83)	14.63	(21.77)	12.63	(18.80)
3 1/2	(90)	3.971	(100.86)	4.500	(114.30)	6.12	(9.11)	16.57	(24.66)	15.01	(22.34)
4	(100)	4.466	(113.44)	4.875	(123.83)	6.82	(10.15)	21.57	(32.10)	18.30	(27.23)

THREADED ROD DATA

Nominal Rod Dia.	Root Area Thread		Max. Rec. Load			
			650°F (343°C)		750°F (399°C)	
			lbs.	kN	lbs.	kN
1/4	.027	(17.42)	240	(1.07)	210	(0.93)
3/8	.068	(43.87)	730	(3.25)	572	(2.54)
1/2	.126	(81.29)	1350	(6.01)	1057	(4.70)
5/8	.202	(130.32)	2160	(9.61)	1692	(7.53)
3/4	.302	(194.84)	3230	(14.37)	2530	(11.25)
7/8	.419	(270.32)	4480	(19.93)	3508	(15.60)
1	.552	(356.13)	5900	(26.24)	4620	(20.55)
1 1/8	.693	(447.10)	7450	(33.14)	5830	(25.93)
1 1/4	.889	(573.55)	9500	(42.26)	7440	(33.09)
1 1/2	1.293	(834.19)	13800	(61.39)	10807	(48.07)
1 3/4	1.744	(1125.16)	18600	(82.74)	14566	(64.79)
2	2.300	(1483.87)	24600	(109.43)	19625	(87.30)
2 1/4	3.023	(1950.32)	32300	(143.68)	25295	(112.52)
2 1/2	3.719	(2399.35)	39800	(177.04)	31169	(138.65)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

TECHNICAL DATA



CAST IRON PIPE DATA

SERVICE WEIGHT CAST IRON SOIL PIPE DATA (BELL & SPIGOT TYPE)

Nominal Pipe Size		O.D. of Cast Iron Pipe		Wall Thickness		Weight			
						Pipe		Water	
						lbs./ft	kg/m	lbs./ft	kg/m
2	(50)	2.25	(57.15)	.17	(4.32)	4.00	(5.95)	1.24	(1.85)
3	(80)	3.25	(82.55)	.17	(4.32)	6.00	(8.93)	2.88	(4.29)
4	(100)	4.25	(107.95)	.18	(4.57)	8.00	(11.91)	5.15	(7.66)
5	(125)	5.25	(133.35)	.18	(4.57)	10.40	(15.48)	8.14	(12.11)
6	(150)	6.25	(158.75)	.18	(4.57)	13.00	(19.35)	11.80	(17.57)
8	(200)	8.38	(212.85)	.23	(5.84)	20.00	(29.76)	21.34	(31.76)
10	(250)	10.50	(266.70)	.28	(7.11)	29.00	(43.16)	33.62	(50.03)
12	(300)	12.50	(317.50)	.28	(7.11)	38.00	(56.55)	48.51	(72.18)
15	(380)	15.62	(396.75)	.31	(7.87)	51.00	(75.90)	76.55	(113.92)

EXTRA WEIGHT CAST IRON SOIL PIPE DATA (BELL & SPIGOT TYPE)

Nominal Pipe Size		O.D. of Cast Iron Pipe		Wall Thickness		Weight			
						Pipe		Water	
						lbs./ft	kg/m	lbs./ft	kg/m
2	(50)	2.38	(60.45)	.190	(4.83)	5.00	(7.44)	1.36	(2.03)
3	(80)	3.50	(88.90)	.250	(6.35)	9.00	(13.39)	3.06	(4.56)
4	(100)	4.50	(114.30)	.250	(6.35)	12.00	(17.86)	5.44	(8.10)
5	(125)	5.50	(139.70)	.250	(6.35)	15.00	(22.32)	8.51	(12.66)
6	(150)	6.50	(165.10)	.250	(6.35)	19.00	(28.28)	12.25	(18.23)
8	(200)	8.62	(218.95)	.310	(7.87)	30.00	(44.64)	21.78	(32.40)
10	(250)	10.75	(273.05)	.375	(9.53)	43.00	(63.99)	34.02	(50.63)
12	(300)	12.75	(323.85)	.375	(9.53)	54.00	(80.36)	48.99	(72.91)
15	(380)	15.88	(403.35)	.440	(11.18)	75.00	(111.61)	76.55	(113.92)

NO HUB CAST IRON SOIL PIPE DATA

Nominal Pipe Size		O.D. of Cast Iron Pipe		Wall Thickness		Weight			
						Pipe		Water	
						lbs./ft	kg/m	lbs./ft	kg/m
1½	(40)	1.90	(48.26)	.16	(4.06)	2.70	(4.02)	0.85	(1.26)
2	(50)	2.35	(59.69)	.16	(4.06)	3.60	(5.36)	1.40	(2.09)
3	(80)	3.35	(85.09)	.16	(4.06)	5.20	(7.74)	3.12	(4.65)
4	(100)	4.38	(111.25)	.19	(4.83)	7.40	(11.01)	5.44	(8.10)
5	(125)	5.30	(134.62)	.19	(4.83)	9.60	(14.29)	8.24	(12.26)
6	(150)	6.30	(160.02)	.19	(4.83)	11.00	(16.37)	11.92	(17.74)
8	(200)	8.38	(212.85)	.23	(5.84)	18.00	(26.79)	21.34	(31.76)
10	(250)	10.50	(266.70)	.28	(7.11)	26.20	(38.99)	33.62	(50.03)
12	(300)	12.50	(317.50)	.28	(7.11)	35.50	(52.83)	48.51	(72.18)

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

TECHNICAL DATA

CONVERSION FACTORS FOR UNITS OF MEASUREMENT

To Convert From	To	Multiply By
Length		
Inch	Millimeter	25.4
Feet	Meter	0.3048
Yard	Meter	0.9144
Mile	Kilometer	1.6093
Area		
Square Inch	Square Millimeter	645.16
Square Feet	Square Meter	0.0929
Square Yard	Square Meter	0.8361
Square Mile	Square Kilometer	2.5899
Volume		
Gallon	Liter	3.7854
Quart	Liter	0.9463
Cubic Inch	Cubic Millimeter	16,387.06
Cubic Feet	Cubic Meter	0.0283
Cubic Yard	Cubic Meter	0.76455
Mass		
Ounce	Gram	28.3495
Pound	Kilogram	0.45359
Short Ton	Kilogram	907.185
Force		
Ounce-Force	Newton	0.278014
Pound-Force	Newton	4.44822
Pressure		
Pound - Force / Square Inch	Kilopascal	6.894757
Foot of Water (39.2°F)	Kilopascal	2.98898
Inch of Mercury (32°F)	Kilopascal	3.38638
Bending Moment		
Pound - Force - Inch	Newton - Meter	0.112985
Pound - Force - Foot	Newton - Meter	1.355818
Energy, Work, & Heat		
Foot - Pound - Force	Joule	1.355818
British Thermal Unit (BTU)	Joule	1,055.056
Calorie	Joule	4.1868
Kilowatt Hour	Joule	3,600,000
Power		
Foot - Pound - Force / Second	Watt	1.355818
British Thermal Unit / Hour	Watt	0.29307
Horsepower	Kilowatt	0.7457
Temperature		
Degree Fahrenheit	Degree Celsius	$\frac{(F^{\circ}-32)}{1.8}$

To Convert From	To	Multiply By
Length		
Millimeter	Inch	0.03937
Meter	Feet	3.28084
Meter	Yard	1.09361
Kilometer	Mile	0.62137
Area		
Square Millimeter	Square Inch	0.001550
Square Meter	Square Feet	10.7639
Square Meter	Square Yard	1.19599
Square Kilometer	Square Mile	0.3861
Volume		
Liter	Gallon	0.26417
Liter	Quart	1.05669
Cubic Millimeter	Cubic Inch	0.000061
Cubic Meter	Cubic Feet	35.31466
Cubic Meter	Cubic Yard	1.30795
Mass		
Gram	Ounce	0.035274
Kilogram	Pound	2.20462
Kilogram	Short Ton	0.0011
Force		
Newton	Ounce-Force	3.59694
Newton	Pound-Force	0.22481
Pressure		
Kilopascal	Pound - Force / Square Inch	0.145038
Kilopascal	Foot of Water (39.2°F)	0.334562
Kilopascal	Inch of Mercury (32°F)	0.295301
Bending Moment		
Newton - Meter	Pound - Force - Inch	8.85073
Newton - Meter	Pound - Force - Foot	0.73756
Energy, Work, & Heat		
Joule	Foot - Pound - Force	0.73756
Joule	British Thermal Unit (BTU)	0.000948
Joule	Calorie	0.23884
Joule	Kilowatt Hour	2.78e-7
Power		
Watt	Foot - Pound - Force / Second	0.73756
Watt	British Thermal Unit / Hour	3.41214
Kilowatt	Horsepower	1.341022
Temperature		
Degree Celsius	Degree Fahrenheit	1.8°C° + 32

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

COMPLIANCES & APPROVALS



Figure Number	ANSI/MSS SP-58	Federal Spec A-A-1192A	U.S. (UL) Listed	CAN. (CUL) Listed	FM Approved	Buy American	100% Domestic
010			1"x1" - 4" 1 1/4"x1" - 6"	1"x1" - 4" 1 1/4"x1" - 6"	1"x1" - 4" 1 1/4"x1" - 6"		
015			1"x2 1/2" - 6" 1 1/4"x2 1/2" - 6"	1"x2 1/2" - 6" 1 1/4"x2 1/2" - 6"	1"x2 1/2" - 8" 1 1/4"x2 1/2" - 8"		
020			3/8"	3/8"			
025			1/2" & 3/4"	1/2" & 3/4"		1/2" & 3/4"	1/2" & 3/4"
030			1" - 8"	1" - 8"	1" - 8"	1" - 8"	1" - 8"
031			2" - 8"	2" - 8"	2" - 8"	2" - 8"	2" - 8"
035			1" - 8"	1" - 8"	1" - 8"	1" - 8"	1" - 8"
040			2" - 8"	2" - 8"	2" - 8"	2" - 8"	2" - 8"
045			1" - 8"	1" - 8"	1" - 8"	1" - 8"	1" - 8"
055			3/4" - 2"	3/4" - 2"			
070			3/4" - 2"	3/4" - 2"		3/4" - 2"	
075			3/4" - 2"	3/4" - 2"		3/4" - 2"	
076			3/4" - 2"	3/4" - 2"		3/4" - 2"	
077			3/4" - 2"	3/4" - 2"		3/4" - 2"	
10						3/8" - 7/8"	3/8" - 7/8"
15 & 15L						3/8" - 1"	3/8" - 1"
20 & 21						1/4" - 1"	1/4" - 1"
25							
30	Type 16	Type 16					
35 & 35L	Type 17	Type 17				3/8" - 1 1/2"	3/8" - 1 1/2"
36			3/8"	3/8"	3/8"		
37			3/8" & 1/2"	3/8" & 1/2"	3/8"		
38	Type 14	Type 14				#2 - #7	#2 - #7
40							
41						5/8" - 1"	5/8" - 1"
47S						3/8" - 5/8"	3/8" - 5/8"
47W						3/8" - 5/8"	3/8" - 5/8"
48							
50 & 50L						3/8" - 1"	3/8" - 1"
55 & 55L						3/8" - 1"	3/8" - 1"
90	Type 24	Type 24				1/2" - 36"	1/2" - 36"
91	Type 24	Type 24				1/2" - 36"	1/2" - 36"
93	Type 24	Type 24				1/2" - 36"	1/2" - 36"
94	Type 24	Type 24				1/2" - 36"	1/2" - 36"
95						1/2" - 10"	1/2" - 10"
100						1/4" - 1"	1/4" - 1"
104						3/8" & 1/2"	3/8" & 1/2"
105						3/8" - 7/8"	3/8" - 7/8"
110 & 110H						1/4" - 1 1/2"	1/4" - 1 1/2"
130						1/4" - 1 1/2"	1/4" - 1 1/2"
134						3/8" - 3/4"	3/8" - 3/4"
135						3/8" - 7/8"	3/8" - 7/8"
136						3/8" & 1/2"	3/8" & 1/2"
141 & 141F	Type 10	Type 10	3/4" - 8"	3/4" - 8"	3/4" - 8"	1/2" - 8"	
143	Type 10	Type 10	3/4" - 8"	3/4" - 8"	3/4" - 8"	1/2" - 8"	
151 & 151F	Type 10	Type 10	2 1/2" - 8"	2 1/2" - 8"	2 1/2" - 8"	2 1/2" - 8"	
152 & 154	Type 10	Type 10					

Due to a mix of stock, you must specify "Buy American" or "100% Domestic" when ordering to ensure the material you receive is in compliance.

COMPLIANCES & APPROVALS

Figure Number	ANSI/MSS SP-58	Federal Spec A-A-1192A	U.S. (UL) Listed	CAN. (CUL) Listed	FM Approved	Buy American	100% Domestic
145 & 155						#1 - #12	#1 - #12
160						#1 - #24	#1 - #24
165						0505 - 5010	0505 - 5010
166						6205 - 41215	6205 - 41215
167						1230 - 16030	1230 - 16030
168						16230 - 41230	16230 - 41230
170	Type 40	Type 40				#1A - #30E	#1A - #30E
180 & 180F	Type 7	Type 7				1/2" - 8"	1/2" - 8"
181	Type 7	Type 7				1/2" - 8"	1/2" - 8"
182	Type 7	Type 7				1/2" - 4"	1/2" - 4"
TRH 2 - TRH 5							
250	Type 23	Type 23	3/8" & 1/2"	3/8" & 1/2"	3/8"	3/8" & 1/2"	3/8" & 1/2"
259						#1 & #2	#1 & #2
270	Type 23	Type 23					
290	Type 23	Type 23	3/8"	3/8"	3/8"		
345	Type 19	Type 19	3/8"	3/8"	3/8"	3/8"	3/8"
350	Type 19 & 23	Type 19 & 23	1/2" - 7/8"	1/2" - 7/8"	1/2"		
350 (1/4")	Type 19	Type 19				1/4"	1/4"
353	Type 19 & 23	Type 19 & 23	3/8"	3/8"	3/8"	3/8"	3/8"
354	Type 19	Type 19	1/2"	1/2"	1/2"	1/2"	1/2"
355	Type 19	Type 19	5/8"	5/8"		5/8"	5/8"
356	Type 19	Type 19	3/4"	3/4"		3/4"	3/4"
357	Type 19	Type 19	7/8"	7/8"		7/8"	7/8"
358			3/8" & 1/2"	3/8" & 1/2"		3/8" - 1/2"	3/8" - 1/2"
359			3/8" & 1/2"	3/8" & 1/2"		3/8" - 7/8"	3/8" - 7/8"
360	Type 19	Type 19	3/8" & 1/2"	3/8" & 1/2"	3/8" & 1/2"		
363	Type 19	Type 19	3/8"	3/8"	3/8"	3/8"	3/8"
364	Type 19	Type 19	1/2"	1/2"	1/2"	1/2"	1/2"
420	Type 1	Type 1				3" - 36"	3" - 36"
425	Type 1	Type 1				1/2" - 36"	1/2" - 36"
426	Type 1	Type 1				1/2" - 36"	1/2" - 36"
430	Type 1	Type 1				1/2" - 12"	1/2" - 12"
440 & 440F	Type 1	Type 1				1/2" - 4"	1/2" - 4"
441	Type 1	Type 1				1/2" - 4"	1/2" - 4"
442	Type 1	Type 1					
450 & 450F	Type 1	Type 1	2 1/2" - 8"	2 1/2" - 8"	2 1/2" - 8"	1/2" - 36"	1/2" - 36"
450V						#1 & #2	#1 & #2
450T						#1 & #2	#1 & #2
451 & 451F	Type 1	Type 1	2 1/2" - 8"	2 1/2" - 8"	2 1/2" - 8"	1/2" - 36"	1/2" - 36"
453	Type 1	Type 1	2 1/2" - 8"	2 1/2" - 8"	2 1/2" - 8"	1/2" - 36"	1/2" - 36"
454	Type 1	Type 1	2 1/2" - 8"	2 1/2" - 8"	2 1/2" - 8"	1/2" - 36"	1/2" - 36"
455 & 456						#1 - #24	#1 - #24
703025 - 708362						703025 - 708362	
460	Type 44	Type 44				6" - 24"	6" - 24"
470 & 475	Type 43	Type 43				6" - 24"	6" - 24"
480	Type 41	Type 41				6" - 24"	
480D						6" - 24"	
485						2" - 42"	2" - 42"

Due to a mix of stock, you must specify "Buy American" or "100% Domestic" when ordering to ensure the material you receive is in compliance.

COMPLIANCES & APPROVALS



Figure Number	ANSI/MSS SP-58	Federal Spec A-A-1192A	U.S. (UL) Listed	CAN. (CUL) Listed	FM Approved	Buy American	100% Domestic
486	Type 44	Type 44				2" - 42"	2" - 42"
487	Type 46	Type 46				2" - 42"	2" - 42"
488						30" - 72"	30" - 72"
490	Type 41	Type 41				6" - 24"	
495						6" - 24"	6" - 24"
496						#1 - #9	
508R	Type 12	Type 12					
510R	Type 12	Type 12					
512 & 512H	Type 12	Type 12					
520 & 521	Type 4	Type 4				1/2" - 36"	1/2" - 36"
522	Type 4	Type 4				3" - 42"	3" - 42"
525	Type 3	Type 3				3/4" - 24"	3/4" - 24"
526	Type 3	Type 3				6" - 36"	6" - 36"
550 & 551	Type 8	Type 8	3/4" - 8"	3/4" - 8"	3/4" - 8"	1/2" - 30"	1/2" - 30"
552 & 554	Type 8	Type 8					
553	Type 8	Type 8				1/2" - 30"	1/2" - 30"
R087100 - R412150						R087100 - R412150	
580						3" - 36"	3" - 36"
585						1" - 1 3/4"	1" - 1 3/4"
590						3" - 24"	3" - 24"
595						3/4" - 1 1/2"	3/4" - 1 1/2"
610 & 620	Type 21	Type 21				3" - 12"	3" - 12"
625						3/8" - 1 1/4"	3/8" - 1 1/4"
630	Type 30 (with Fig. 25)	Type 30 (with Fig. 25)					
632	Type 28 (with Fig. 35)	Type 28 (with Fig. 35)				A & B	A & B
633	Type 29 (with Fig. 35)	Type 29 (with Fig. 35)				A & B	A & B
635	Type 27	Type 27				3/8" - 3/4"	3/8" - 3/4"
651	Type 39	Type 39				3/4" - 12"	3/4" - 12"
653	Type 39	Type 39				3/4" - 36"	3/4" - 36"
654	Type 39	Type 39				3/4" - 36"	3/4" - 36"
655	Type 39	Type 39				1 1/4" - 36"	1 1/4" - 36"
656	Type 39	Type 39				2" - 36"	2" - 36"
658	Type 39	Type 39				4" - 36"	4" - 36"
670 - 678						#4 - #30	#4 - #30
690	Type 35	Type 35				1/2" - 24"	1/2" - 24"
825 & 826						1/4" - 4"	1/4" - 4"
830	Type 26	Type 26				1/2" - 4"	1/2" - 4"
835						1/2" - 4"	1/2" - 4"
836						1/8" - 2"	1/8" - 2"
837						1/2" - 4"	1/2" - 4"
840							
850	Type 31	Type 31				#1 - #3	#1 - #3
850C						3/8" & 1/2"	3/8" & 1/2"
855	Type 32	Type 32				#0 - #2	#0 - #2
860	Type 33	Type 33				#0 - #5	#0 - #5
870						1 1/2" - 12"	1 1/2" - 12"
871						1" - 6"	1" - 6"
874						2" - 12"	2" - 12"

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COMPLIANCES & APPROVALS

Figure Number	ANSI/MSS SP-58	Federal Spec A-A-1192A	U.S. (UL) Listed	CAN. (CUL) Listed	FM Approved	Buy American	100% Domestic
875	Type 38	Type 38				2½" - 36"	2½" - 36"
876	Type 38	Type 38				2½" - 36"	2½" - 36"
877	Type 38 (with Fig. 880)	Type 38 (with Fig. 880)				1½" - 4"	1½" - 4"
878						2½" - 36"	2½" - 36"
879						2½" - 36"	2½" - 36"
880	Type 36	Type 36				2½" - 36"	2½" - 36"
882	Type 37	Type 37				2½" - 36"	2½" - 36"
883						2" - 24"	2" - 24"
885						¾" - 1"	¾" - 1"
900 & 900-1	Type 22	Type 22				¾" - 2"	¾" - 2"
903						¾" - 2"	¾" - 2"
904						¾" - 2"	¾" - 2"
905	Type 34	Type 34					
906	Type 34	Type 34	¾"	¾"	¾"	¾"	¾"
910						#1 - #4	#1 - #4
920	Type 34	Type 34				¾" - 7/8"	¾" - 7/8"
925	Type 34	Type 34				¾" & 1½"	¾" & 1½"
930						¾" - 2"	¾" - 2"
935 & 936	Type 57	Type 57				1½" - 1½"	1½" - 1½"
940 & 941			¾"	¾"			
942							
945			¾"	¾"		¾"	¾"
946						¾"	¾"
950 & 951	Type 18	Type 18				1/4" - 3/4"	1/4" - 3/4"
950N & 951N						1/4" - 3/4"	1/4" - 3/4"
960	Type 13	Type 13				3/8" - 1½"	3/8" - 1½"
970 & 970F	Type 5	Type 5				1½" - 8"	1½" - 8"
973	Type 5	Type 5				1½" - 8"	1½" - 8"
990			¾"	¾"		¾"	
995						¾"	

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