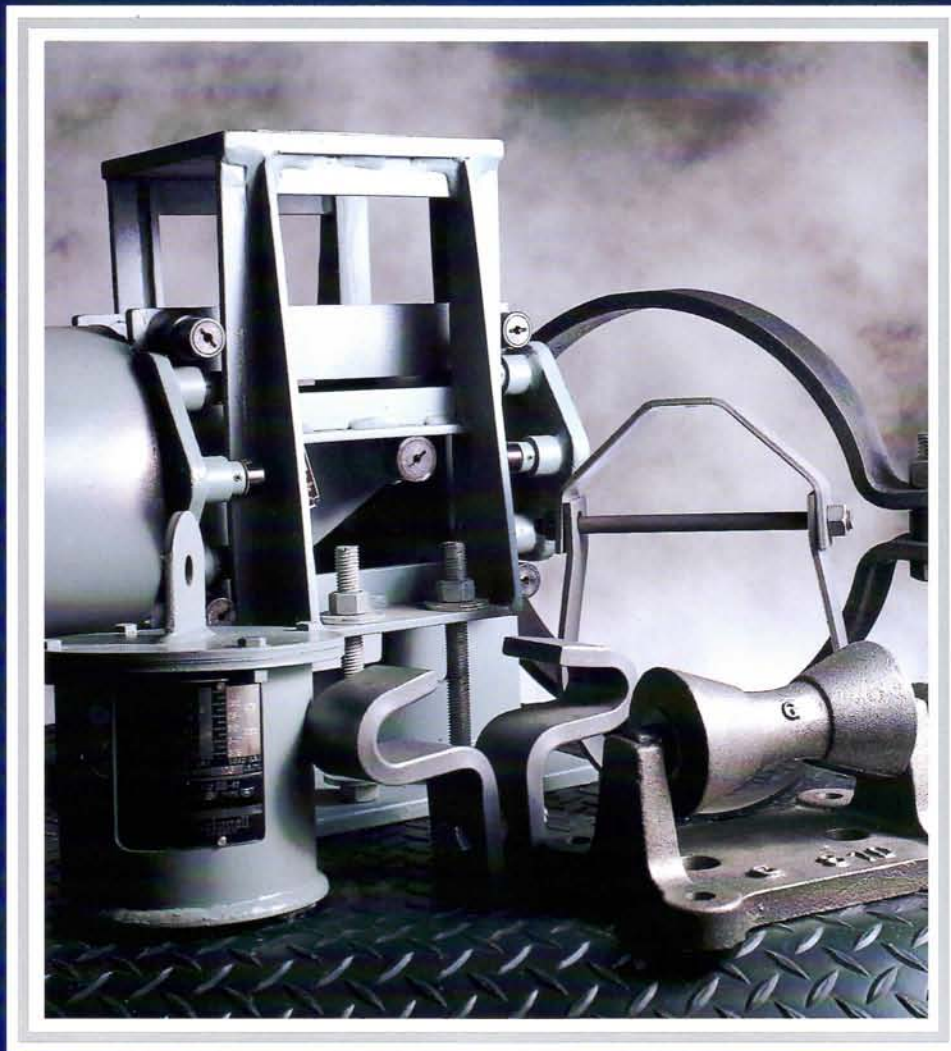




# Grinnell®

## Pipe Hangers

Catalog PH-98



A **tyco** INTERNATIONAL LTD. COMPANY



**GRINNELL**

***Your Most  
Visible Means  
of Support.***

## PIPE HANGERS

The present line of Grinnell pipe hangers and supports is the result of a century of experience in the industrial piping field. This large, complete line includes a pipe hanger or support of American manufacture for any suspension problem encountered in pipe installation work.

Many of Grinnell's hangers are listed by the Underwriters' Laboratories, Inc. and approved by the Factory Mutual Laboratories for use in fire protection systems.

Maximum recommended load ratings for hangers have been established through testing by the Research and Development Department of Grinnell and are based on the allowable stresses specified in the ASME B31.1 code for Pressure Piping or Manufacturers Standardization Society Standard Practice SP-58, or Grinnell Design Standards, as applicable.

When some detail of construction or piping arrangement makes it necessary to deviate from standard types of hangers, Grinnell, with its unrivaled design and manufacturing facilities, is equipped to furnish hangers and supports of any required type. Grinnell is continually cooperating with engineers and architects in the preparation of specifications covering hanger requirements and the interpretation of applicable piping codes.

Grinnell is proud of the exacting standards of research design, engineering and manufacturing that go into the production of all its hangers and its recognized leadership in the field of pipe hangers and supports.

For Galvanized Products Only. All threaded components are electro-galvanized, hot dip galvanizing is available on special request. Malleable items are either hot dip galvanized or electro-galvanized.

## WARNING

Pipe hanger products included in this catalog are intended for installation and service only as described or specified herein.

We are aware these products have also been used (often without incident) for purposes and in ways other than those for which designed and manufactured. In such cases of misapplication or improper use, we cannot be held responsible for injuries or property damage which may result, some examples of which are: use of hanger products as erection tools; use of beam clamps on a beam not specified for them; use of concrete inserts as an anchor for pulling pipe to proper elevation; suspension of one clevis hanger under another, resulting in a cumulative load greater than specified support capability.

These Grinnell pipe hanger products are carefully designed and manufactured to the above mentioned standards, as applicable. Care should be exercised by installers and end users to install, use and maintain these products properly to avoid any possible on-the-job accidents.

All designs are subject to change without notice.

## ISO 9000

Products manufactured at the North Kingstown RI, Henderson TN, Columbia PA, Statesboro GA, and Harvey IL manufacturing plants are produced to approved ISO 9000 quality programs.

## NUCLEAR PRODUCTS

For Nuclear Qualified Products request appropriate LCD/DRS from your Grinnell Representative.

The Grinnell Pipe Support Division is accredited by ASME and has been granted an "NPT" Nuclear Certificate of Authorization. The Pipe Support Division has also been assessed - and the Quality activities verified - by the Utilities Joint Program-Nuclear Procurement Issues Committee (NUPIC) and various individual utilities.

All welded products are welded by individuals and procedures qualified to ASME Section IX Qualification Standard for Welding.

## FIRE PROTECTION PRODUCTS

Catalog PH-98 describing Grinnell Pipe Hangers, where applicable, indicates whether a particular hanger is UL Listed and/or FM Approved.

The UL "Fire Protection Equipment Directory" states that requirements for installation and use of UL Listed hangers are included in the Standard of the National Fire Protection Association for Installation of Sprinkler Systems, NFPA 13.

When approved hangers are used for fire protection service, they should be installed in compliance with the applicable standards of the National Fire Protection Association, in addition to the standards of any other authorities having jurisdiction.

"Safety factors are in accordance with the approvals and/or codes listed in this catalog for the applicable product"

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## pipe rings • clamps • clevises

## pictorial guide



adj. swivel ring split ring type fig. 104  
¾ to 8 in. pipe

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split ring fig. 108  
¾ to 8 in. pipe  
• fig. CT-109  
½ to 3 in. copper tubing

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adj. ring fig. 97  
½ to 4 in. pipe  
• fig. CT-99  
■ ½ to 4 in. copper tubing

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pipe or conduit hanger fig. 67  
½ to 6 in. pipe

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adj. swivel ring fig. 69  
½ to 8 in. per NFPA stds.  
fig. 70 2½ to 8 in. pipe  
• fig. CT-69 ½ to 4 in. copper tubing.

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## clamps • clevises



extension split clamp fig. 138 ¾ to 3 in. pipe threaded  
fig. 138R ¾ to 3 in. rod threaded  
• fig. CT-138R ½ to 2 in. copper tubing.

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adj. clevis fig. 260  
½ to 30 in. pipe,  
fig. 65. ¾ to 4 in. pipe,  
• fig. CT-65 ½ to 4 in. copper tubing

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adj. clevis for insulated lines fig. 300.  
¾ to 12 in. pipe

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extension pipe or riser clamp fig. 261,  
¾ to 24 in. pipe  
• fig. CT-121  
½ to 4 in. copper tubing  
riser fig. 40, 2 to 24 in. clamp  
half clamp fig. 38SD  
custom design fig. 40 S.D.

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extended clamp fig. 100  
¾ to 8 in. pipe

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offset pipe clamp fig. 103  
¾ to 8 in. pipe

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## clamps • socket clamps



pipe clamp medium fig. 212,  
½ to 30 in. pipe  
heavy fig. 216  
3 to 42 in. pipe  
earthquake bracing fig. 212FP ½ to 8" pipe  
custom design fig. 42, S.D.

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double-bolt pipe clamp fig. 295, ¾ to 36 in.  
fig. 295A, alloy,  
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fig. 295H, heavy duty  
6 to 36 in.  
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alloy pipe clamp fig. 224  
4 to 16 in. pipe

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heavy-duty alloy pipe clamp fig. 246  
10 to 24 in. pipe

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socket clamp fig. 600  
3 to 24 in. pipe

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socket clamp fig. 595  
4 to 24 in. pipe  
NFPA-24

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## beam clamps



adjustable beam clamp fig. 14  
¾ to ¾ in. rod

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malleable beam clamp fig. 218

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beam clamp standard duty fig. 133  
flange width 4 to 8 in.

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beam clamp heavy duty fig. 134  
flange widths 4 to 12 in.

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• top beam clamp fig. 227  
¾ to 6 in. pipe

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- For copper tubing.
- Also available plastic coated.

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## beam clamps (cont'd) • C-clamps



Universal side I-beam clamp fig. 225, Universal channel clamp fig. 226 when used with heel plate.



adjustable side beam clamp fig. 217 adjust to various beam flange width and thicknesses.



UFS beam clamp with UFS nut fig. 228



UFS beam clamp with weldless eye nut fig. 292 left hand thread fig. 292L



C-clamp figs. 86, 87, 88 fig. 89 retaining clip  $\frac{3}{8}$  to  $\frac{1}{4}$  in. rod

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## C-clamps • structural attachments



C-type clamp top & bottom beam fig. 92 std. throat  $\frac{3}{8}$  and  $\frac{1}{2}$  in. rod fig. 89X retaining clip

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C-type clamp top & bottom beam fig. 93 wide throat  $\frac{3}{8}$  and  $\frac{1}{2}$  in. rod fig. 89X retaining clip

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wide throat top beam clamp fig. 94  $\frac{3}{8}$  and  $\frac{3}{4}$  in. rod fig. 89X retaining clip

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steel C-clamp w/lock nut fig. 95  $\frac{7}{8}$  to  $\frac{1}{2}$  in. rod fig. 96 retaining clip

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welded beam attachment fig. 66  $\frac{3}{8}$  to  $3\frac{1}{2}$  in. rod

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steel washer plate fig. 60  $\frac{3}{8}$  to  $3\frac{1}{4}$  in. rod

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## brackets • trapeze assembly



brace fitting fig. 112, complete fig. 113, pipe end only 1 &  $1\frac{1}{4}$  in. IPS

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side beam bracket fig. 202  $\frac{3}{8}$  to  $\frac{1}{2}$  in. rod

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side beam bracket fig. 206  $\frac{3}{8}$  to  $\frac{1}{2}$  in. rod fig. 207 two bolt hole threaded side beam brackets fig. 207  $\frac{3}{8}$  &  $\frac{1}{2}$  in. rod angle clips fig. 68

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light welded steel bracket fig. 194

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welded steel brackets medium fig. 195 max load: 1500 lb.; heavy fig. 199 max load: 3000 lb.

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Universal trapeze assembly fig. 46 trapeze assembly fig. 45, fig. 50

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## structural attachments • concrete attachments



structural welding lug fig. 55  $\frac{1}{2}$  to  $3\frac{3}{4}$  in. rod (short)  $\frac{1}{2}$  to 2 in. rod (long) welding lug for LR elbow fig. 53SD

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two hole welding lug fig. 54  $\frac{1}{2}$  to  $2\frac{1}{4}$  in. rod

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concrete single lug plate fig. 47  $\frac{1}{2}$  to 2 in. rod

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concrete clevis plate fig. 49  $\frac{3}{8}$  to 2 in. rod

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concrete rod attachment plate fig. 52  $\frac{3}{8}$  to 1 in. rod

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## concrete inserts • ceiling flanges • ceiling plates



CB-Universal  
concrete insert  
fig. 282  
3/8 to 1/2 in. rod

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screw  
concrete insert  
fig. 152  
3/8 to 7/8 in. rod

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light weight steel  
concrete insert  
fig. 285  
1/4 to 3/8 in. rod

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wedge type  
concrete insert  
fig. 281  
1/4 to 7/8 in. rod

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pipe hanger  
flange  
fig. 153  
for 3/8 to 3/4 in. rod

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ceiling flange  
pipe threaded fig. 128  
1/4 in. IPS;  
rod threaded fig. 128R  
3/8 and 1/2 in. rod  
• fig. CT-128R  
copper finish  
3/8 and 1/2 in. rod

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## ceiling flanges • ceiling plates • rods • bolts



plastic  
ceiling plate  
fig. 127  
3/8 and 1/2 in. rod

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cast iron  
ceiling plate  
fig. 395  
1/2 to 8 in. pipe

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hanger rods  
machine threaded:  
both ends - fig. 140,  
3/8 to 3 3/4 in.  
continuous thread - fig.  
146, 1/4 to 1 1/2 in.  
RH/LH thread - fig. 253  
3/8 to 3 3/4 in.

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coach screw rods:  
other end  
machine threaded  
fig. 142 3/8 to 3/4 in.

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eye rods:  
welded 3/8 to 2 1/2 in. (RH)  
fig. 278, (LH) fig. 278L  
not welded 3/8 to 2 1/2 in.  
(RH) fig. 248 (LH) fig. 248L  
linked welded 3/8 to 2 1/2 in.  
fig. 278X  
linked not welded 3/8 to 2 1/2  
in. fig. 248X

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## rods • bolts • rod attachments



rod with  
eye end  
fig. 148  
2 3/4 to 5 in.

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hydraulic shock  
and sway  
suppressor  
tapered  
load pin  
fig. 312  
3/8 to 2 in.

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clevis pin  
w/cotters  
fig. 291  
1/2 to 4 in.

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machine hex head  
bolts with nuts,  
3/8 to 1 1/8 in.  
hex head nuts,  
1/4 to 1 1/2 in.  
heavy hex head  
nuts 1 3/4 to 3 3/4 in.

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weldless  
eye nut  
fig. 290 (RH)  
fig. 290L (LH)  
3/8 to  
2 1/2 in. rod

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forged steel  
clevis  
fig. 299  
3/8 to  
4 in. rod

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forged steel  
turnbuckle  
fig. 230  
3/8 to 2 1/2 in. rod

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## rod attachments



carbon steel  
turnbuckle  
fig. 233  
1 1/4 to 5 in. rod

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turnbuckle  
adjuster  
fig. 114  
1/4 to  
3/4 in. rod

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rod coupling  
fig. 136  
1/4 to 1 in. rod  
Fig. 136R reducing  
3/8 x 1/4, 1/2 x 3/8

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rod coupling  
fig. 135  
1/2 to 1 in. rod  
fig. 135E  
(less sight hole)  
1/4 to 3/4 in. rod  
reducing fig. 135R

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socket  
rod thr'd fig. 110R  
1/4 to 7/8 in. rod

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• extension piece  
fig. 157  
3/8 to 7/8 in. rod

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• For copper tubing.

# Grinnell

## U-bolts • straps • pipe saddles



■ st'd U-bolt fig. 137  
1/2 to 36 in. pipe;  
non standard  
dimensions  
fig. 137S  
lightweight U-bolt  
fig. 120  
1/2 to 10 in. pipe

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strap short fig. 262  
1/2 to 4 in. pipe

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one hole clamp  
fig. 126  
3/8 to 4 in. pipe

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pipe saddle  
support  
fig. 258  
4 to 12 in. pipe

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pipe stanchion  
saddle fig. 259  
4 to 36 in. pipe  
adjustable pipe  
stanchion fig. 62  
2 to 18 in. pipe  
pipe stanchion  
fig. 63 2 1/2 to 42 in.  
pipe

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adjustable  
pipe stanchion  
saddle w/  
U-bolt  
fig. 191  
2 to 12 in. pipe

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adjustable  
pipe saddle  
support  
fig. 192  
2 to 12 in. pipe

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## pipe saddles • protection saddle • pipe rolls



adjustable pipe  
saddle support  
fig. 264  
2 1/2 to 36 in. pipe

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pipe covering  
protection  
saddle  
fig. 160 - 165  
carbon steel  
fig. 165A, 166A  
alloy steel

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insulation  
protection  
shield  
fig. 167

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rib-lok  
protection  
shield  
fig. 168

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adj. steel yoke  
pipe roll  
fig. 181  
2 1/2 to 24 in. pipe

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roller chair  
fig. 175  
2 to 30 in. pipe

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## pipe rolls



single pipe roll  
fig. 171  
1 to 30 in. pipe

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adjustable pipe  
roll support  
fig. 177  
1 to 30 in. pipe

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pipe roll stand  
complete  
fig. 271  
2 to 42 in. pipe

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adjustable pipe roll  
with base fig. 274;  
without base fig. 275  
2 to 30 in. pipe

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pipe roll and plate  
fig. 277  
2 to 24 in. pipe  
fabricated roller for  
large dia. pipe  
low friction pipe roll  
with saddle fig. 75SD  
4 to 42 in. pipe.

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## pipe alignment guides • pipe slides



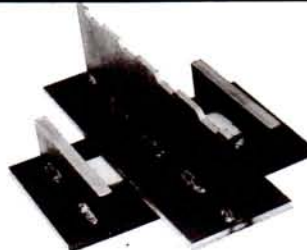
pipe  
alignment  
guide  
fig. 255  
3 to 24 in. pipe  
fig. 254  
1 to 8 in. pipe

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pipe alignment guide  
fig. 256  
3 to 24 in. pipe

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pipe slide assemblies  
257 257A  
436 436A  
439 439A  
pipe slide assembly  
complete, fig. 439  
structural "H"  
slide assembly  
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fig. 242, 243, 244

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- For copper tubing.
- Also available plastic coated.



## travelers • spring hangers



horizontal traveler  
fig. 170  
dual direction  
fig. 72SD  
double roll  
fig. 71SD

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spring cushion  
for pipe rolls  
fig. 178

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light duty  
spring hanger  
fig. 247

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Pre-Engineered  
spring hanger  
figs. 82, 98, B-268  
corrosion resistant  
C-82, C-98, C-268

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## constant supports • sway braces • sway strut assembly • shock suppressors



Constant support hanger  
load: 27 to 87500 lb.  
horizontal: fig. 81-H

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Constant support hanger  
load: 114 to 87500 lb.  
vertical: fig. 80-V

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vibration control  
and sway brace  
figs. 296, 297, 298  
301, 302, 303  
available corrosion  
resistant

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sway strut assemblies  
figs. 211, 222, 640.  
available corrosion resistant  
fig. 210  
replacement strut

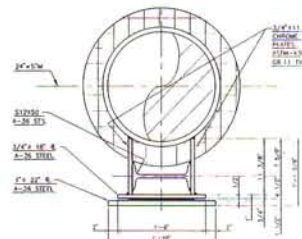
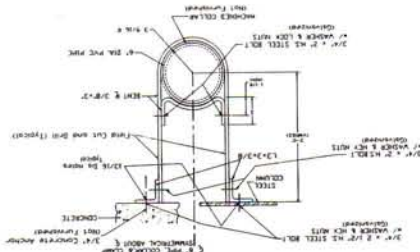
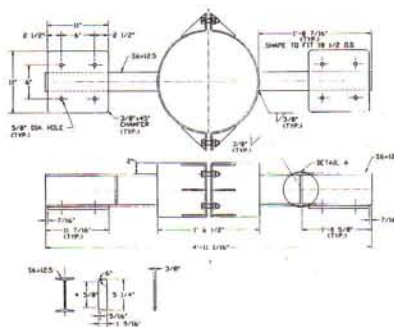
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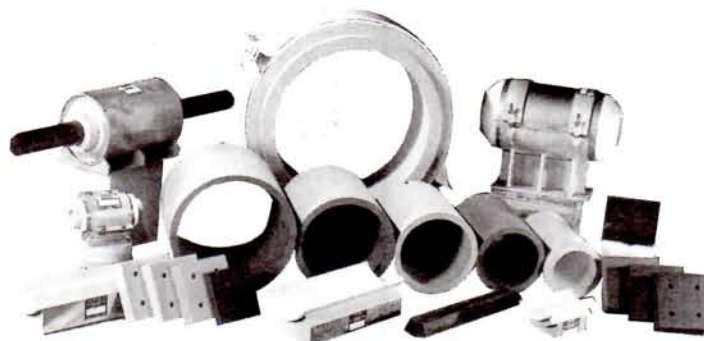
hydraulic shock and  
sway suppressor  
fig. 200 fig. 201  
fig. C-200 fig. C-201  
corrosion resistant

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## fabrication



## pre-insulated slides and guides



# Grinnell

## rings • clamps

### split pipe ring fig. 108



**SIZE RANGE:** 3/8 through 8 inch.

**MATERIAL:** Malleable iron.

**FINISH:** Black

**SERVICE:** Recommended for suspension of non-insulated pipe lines or conduit.

May be used with rod socket fig. 110R or turnbuckle adjuster fig. 114.

**MAXIMUM TEMPERATURE:** 450°F.

**APPROVALS:** Complies with Federal Specification WW-H-171E (Type 11) and Manufacturers Standardization Society SP-69 (Type 11).

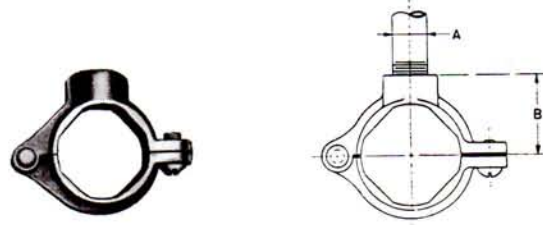
**FEATURES:**

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

**ORDERING:** Specify pipe size, figure number, name, loads • weights

pipe size	max recom load, lb	weight (approx) lbs each	C	bolt size
3/8	200	.06	3/4	#10-32 x 7/8
1/2	200	.09	15/16	1/4 x 1
3/4	300	.11	1 1/8	1/4 x 1
1	300	.13	1 1/4	1/4 x 1
1 1/4	300	.18	1 9/16	1/4 x 1
1 1/2	300	.26	1 11/16	1/4 x 1 1/4
2	300	.33	2 1/16	1/4 x 1 1/4
2 1/2	450	.44	2 1/4	1/4 x 1 1/4
3	450	.63	2 3/4	1/4 x 1 1/4
3 1/2	450	.81	3 1/8	1/4 x 1 1/4
4	520	.97	3 3/8	3/8 x 2
5	520	1.5	4 1/2	3/8 x 2
6	1300	2.6	5 7/16	1/2 x 2
8	1800	5.2	6 3/8	1/2 x 2

### extension split pipe clamp pipe threaded: fig. 138 rod threaded: fig. 138R



**SIZE RANGE:** 3/8 through 3 inch Fig. 138R.  
3/8 through 2 inch Fig. 138.

**MATERIAL:** Malleable iron.

**FINISH:** Black or plated; furnished black unless otherwise specified.

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

**MAXIMUM TEMPERATURE:** 450°F.

**APPROVALS:** Complies with Federal Specification WW-H-171E (Type 25) and Manufacturers Standardization Society SP-69 (Type 12).

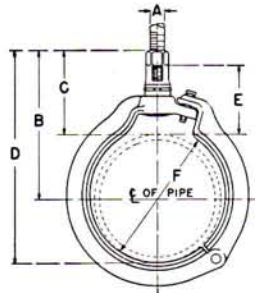
**FEATURES:**

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

**ORDERING:** Specify pipe size, figure number, whether tapped for pipe or rod, name.

pipe size	max recom load, lb	wgt (approx) lbs each		A		B
		fig. 138	fig. 138R	nipple	rod	
3/8	180	.11	.10	1/4	3/8	13/16
1/2	180	.14	.13	1/4	3/8	7/8
3/4	180	.15	.14	1/4	3/8	1
1	180	.17	.16	1/4	3/8	1 1/8
1 1/4	180	.23	.22	1/4	3/8	1 5/8
1 1/2	180	.25	.24	1/4	3/8	1 7/8
2	180	.31	.31	1/4	3/8	1 11/16
2 1/2	300	.61	.60	1/2	1/2	2 1/8
3	300	.76	.74	1/2	1/2	2 7/8

**adjustable swivel ring,  
split ring type  
fig. 104**



**SIZE RANGE:** 3/4 through 8 inch.

**MATERIAL:** Malleable iron.

**FINISH:** Black or plated; furnished black unless otherwise specified.

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

**MAXIMUM TEMPERATURE:** 450°F.

**APPROVALS:** Complies with Federal Specification WW-H-171E (Type 6) and Manufacturers Standardization Society SP-69 (Type 6).

**FEATURES:**

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

**ORDERING:** Specify pipe size, name.

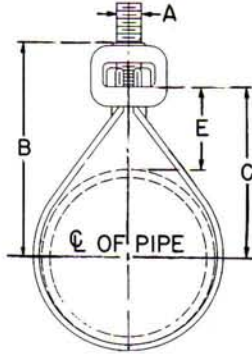
**loads • weights • dimensions (inches)**

pipe size	max recom load, lb	wgt (approx) lbs each	thread size UNC A	B	C	D	E	inside diam of ring, F
3/4	300	.31	3/8	27/8	23/8	37/16	115/16	13/16
1	300	.32	3/8	27/8	21/4	39/16	13/4	17/16
1 1/4	300	.34	3/8	3	29/16	37/8	111/16	113/16
1 1/2	300	.41	3/8	3 1/8	29/16	4 1/8	111/16	21/16
2	300	.48	3/8	3 1/2	25/16	411/16	113/16	2 1/2
2 1/2	500	.58	1/2	3 15/16	2 1/2	5 3/8	17/8	3
3	500	1.0	1/2	4 3/8	2 5/8	6 1/8	2	3 3/4
4	900	1.7	5/8	5 13/16	3 9/16	8 1/16	2 7/8	4 13/16
5	900	2.5	5/8	6 3/8	3 5/8	9 3/16	2 15/16	5 15/16
6	1300	3.8	3/4	7 5/8	4 5/16	10 15/16	3 1/2	7 1/16
8	1800	6.1	7/8	9 1/8	4 7/8	13 1/2	3 7/8	9 1/16

# Grinnell

## pipe rings

adjustable pipe ring  
fig. 97  
plastic coated:  
fig. 97c



**SIZE RANGE:** 1/2 through 4 inch.

**MATERIAL:** Malleable iron adjusting nut; steel band.

**FINISH:** Adjusting nut black; steel band plated.

**SERVICE:** Recommended for suspension of non-insulated, stationary pipe lines or conduit.

**MAXIMUM TEMPERATURE:** 450°F.

**APPROVALS:** Underwriters' Laboratories listed and Factory Mutual approved for 3/4 through 4 inch pipe. Complies with Federal Specification WW-H-171E (Type 9) and Manufacturers Standardization Society SP-69 (Type 9).

**INSTALLATION:** Full load rating is obtained when rod is screwed to bottom of the opening in the nut.

**FEATURES:**

- Large sight hole provides means of ascertaining proper thread engagement.
- Design of band provides greater load carrying capacity.
- Nut may be attached to rod before pipe is picked up in band and snapped into position.
- Greater vertical adjustability.

**ORDERING:** Specify pipe size, figure number, name.

**fig. 97c coated adjustable pipe ring**

**SIZE RANGE:** 3/4 through 4 inch.

**MATERIAL:** Malleable iron adjusting nut; plastic coated steel band.

**SERVICE:** Recommended for suspension of glass, copper, brass and aluminum pipe.

**MAXIMUM TEMPERATURE:** 225°F.

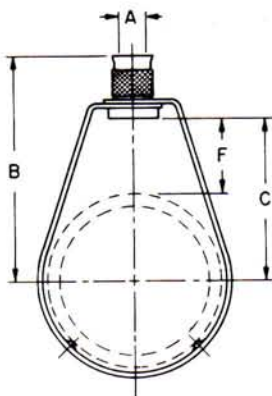
**FEATURE:** No metal surface in contact with pipe.

**ORDERING:** Specify pipe size, figure number, name.

**loads • weights • dimensions (inches)**

pipe size	max recom load lb	wgt (approx) lb each	thread size UNC			adjustment E
			A	B	C	
1/2	400	.14	3/8	2 1/2	1 3/4	1 3/8
3/4	400	.15	3/8	2 5/8	1 7/8	1 3/8
1	400	.15	3/8	2 3/4	2	1 3/8
1 1/4	400	.16	3/8	3	2 1/4	1 3/8
1 1/2	400	.17	3/8	3 1/8	2 3/8	1 3/8
2	400	.18	3/8	3 5/16	2 9/16	1 3/8
2 1/2	650	.35	1/2	3 7/8	3	1 9/16
3	650	.37	1/2	4 1/4	3 3/8	1 5/8
4	1300	.82	5/8	5 7/16	4 5/16	2 1/16

**adjustable swivel ring  
tapped per NFPA standards  
fig. 69**



**SIZE RANGE:** Fig. 69 ½" - 8"

**MATERIAL:** Carbon steel.

**FINISH:** Plated.

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

**MAXIMUM TEMPERATURE:** 650°F.

**APPROVALS:** Fig. 69 Underwriters' Laboratories listed and Factory Mutual approved ¾" thru 8". Complies with Federal Specification WW-H-171E (Type 10) and Manufacturers Standardization Society SP-69 (Type 10).

**FEATURES:**

- Threads are countersunk so that they cannot become burred or damaged.
- Knurled swivel nut provides vertical adjustment after piping is in place.
- Captured swivel nut in the ½ through 2 inch sizes will not fall out.

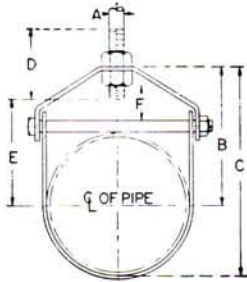
**ORDERING:** Specify size, figure number, name.

**loads • weights • dimensions (inches)**

pipe size	max recom load, lb	weight (approx) lbs each	thread size UNC A	B	C	F
½	300	.09	¾	2¼	1⅞	⅞
¾	300	.09	¾	2⅝	1⅞	⅞
1	300	.10	¾	2⅞	1⅞	⅞
1¼	300	.10	¾	2⅞	1⅞	⅞
1½	300	.10	¾	2⅞	1⅞	⅞
2	300	.11	¾	3¼	2⅞	1⅞
2½	525	.25	¾	4	2⅞	1⅞
3	525	.27	¾	4¾	3⅞	1⅞
4	650	.48	¾	4⅞	3⅞	1⅞
5	1000	.53	½	5⅞	4¾	1⅞
6	1000	1.0	½	6⅞	5⅞	2⅞
8	1000	1.0	½	8	7	2⅞

# Grinnell

## adjustable clevis, light weight fig. 65



**SIZE RANGE:**  $\frac{3}{8}$  through 4 inch.

**MATERIAL:** Carbon iron.

**FINISH:** Black or galvanized.

**SERVICE:** Recommended for suspension of light loads, pipe or conduit.

**MAXIMUM TEMPERATURE:** 650°F.

**APPROVALS:** Underwriters' Laboratories listed in sizes  $\frac{1}{2}$  through 4 inch. Complies with Federal Specification WW-H-171 Latest Edition (Type 12).

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

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

**FEATURES:** An economical attachment for light duty service.

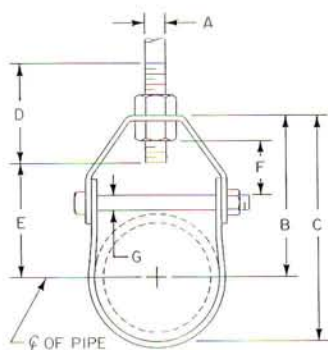
**ORDERING:** Specify pipe size, figure number, name.

NOTE: "Punched holes in bottom of clevis hangers are for riveting insulation shields to clevis hanger."

### loads • weights • dimensions (inches)

pipe size	maximum recommended load, lbs	weight (approx) lbs each	A	B	C	D	rod take out E	adjustment F
$\frac{3}{8}$	150	0.09	$\frac{3}{8}$	1 $\frac{1}{2}$	1 $\frac{27}{32}$	1 $\frac{7}{16}$	1 $\frac{1}{16}$	$\frac{5}{16}$
$\frac{1}{2}$	150	0.10	$\frac{3}{8}$	1 $\frac{11}{16}$	2 $\frac{3}{32}$	1 $\frac{9}{16}$	1 $\frac{1}{4}$	$\frac{7}{16}$
$\frac{3}{4}$	250	0.17	$\frac{3}{8}$	1 $\frac{7}{8}$	2 $\frac{13}{32}$	1 $\frac{5}{8}$	1 $\frac{7}{16}$	$\frac{1}{2}$
1	250	0.18	$\frac{3}{8}$	2 $\frac{5}{32}$	2 $\frac{13}{16}$	1 $\frac{3}{4}$	1 $\frac{11}{16}$	$\frac{5}{8}$
1 $\frac{1}{4}$	250	0.21	$\frac{3}{8}$	2 $\frac{17}{32}$	3 $\frac{3}{8}$	1 $\frac{15}{16}$	2 $\frac{1}{16}$	$\frac{13}{16}$
1 $\frac{1}{2}$	250	0.24	$\frac{3}{8}$	2 $\frac{13}{16}$	3 $\frac{13}{16}$	2 $\frac{1}{16}$	2 $\frac{3}{8}$	$\frac{15}{16}$
2	250	0.26	$\frac{3}{8}$	3 $\frac{1}{32}$	4 $\frac{17}{32}$	2 $\frac{5}{16}$	2 $\frac{7}{8}$	1 $\frac{3}{16}$
2 $\frac{1}{2}$	350	0.48	$\frac{1}{2}$	3 $\frac{27}{32}$	5 $\frac{3}{32}$	2 $\frac{3}{4}$	3 $\frac{1}{4}$	1 $\frac{5}{16}$
3	350	0.55	$\frac{1}{2}$	4 $\frac{15}{32}$	6 $\frac{7}{32}$	3	3 $\frac{3}{8}$	1 $\frac{5}{8}$
3 $\frac{1}{2}$	350	0.6	$\frac{1}{2}$	4 $\frac{31}{32}$	6 $\frac{31}{32}$	3 $\frac{1}{4}$	4 $\frac{3}{8}$	1 $\frac{7}{8}$
4	400	0.73	$\frac{1}{2}$	5 $\frac{17}{32}$	7 $\frac{25}{32}$	3 $\frac{1}{2}$	4 $\frac{15}{16}$	2 $\frac{1}{8}$

**adjustable clevis hanger**  
fig. 260



NOTE: Punched forming holes may be present on certain sizes of this clevis hanger. These holes are solely for the purpose of manufacturing, and do not effect the structural integrity of load carrying capacities of these hangers.

**SIZE RANGE:** 1/2 through 30 inch.

**MATERIAL:** Carbon steel.

**FINISH:** Black or galvanized; furnished black unless otherwise specified.

**SERVICE:** Recommended for the suspension of stationary pipe lines.

**MAXIMUM TEMPERATURE:** 450°F.

**APPROVALS:** Underwriters' Laboratories listed and Factory Mutual approved for 3/4 through 8 inch pipe. Complies with Federal Specification WW-H-171 Latest Edition (Type 1) and Manufacturers Standardization Society SP-69 (Type 1).

**INSTALLATION:** Hanger load nut *above* clevis must be tightened securely to assure proper hanger performance. When an oversized clevis is used, a nipple should be placed over the clevis bolt as a spacer to assure that the lower U-strap will not move in on the bolt.

**ADJUSTMENT:** Vertical adjustment without removing pipe may be made from 3/8 to 5 1/8 inches, varying with the size of clevis. Tighten upper nut after adjustment.

**FEATURES:**

- Design has yoke on outside of lower U-strap so yoke cannot slide toward center of bolt, thus bending of bolt is minimized
- Sizes 5-inch and up have rod and two nuts instead of bolt and nut; thread length on clevis rod is such that the thread locks the nuts in place, and threads are not in shear plane.
- Patented design: U.S. Patent #5,219,427.

**ORDERING:** Specify pipe size, figure number, name, finish.

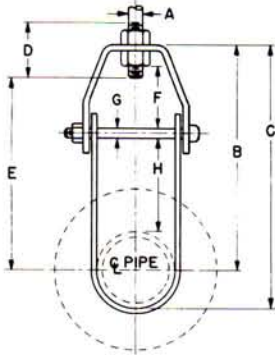
**loads • weights • dimensions (inches)**

pipe size	max. recom. load, lb	weight (approx) lbs each	size of steel		A	B	C	D	rod take out E	adjustment F	G
			upper	lower							
1/2	610	0.30	1/8 x 1	1/8 x 1	3/8	2	2 1/16	1 1/2	1 1/16	3/8	1/4
3/4	610	0.30	1/8 x 1	1/8 x 1	3/8	2 1/16	2 1/16	1 1/2	1 1/16	1/2	1/4
1	610	0.35	1/8 x 1	1/8 x 1	3/8	2 1/16	3	1 3/4	1 1/16	5/8	1/4
1 1/4	610	0.40	1/8 x 1	1/8 x 1	3/8	2 3/16	3 1/4	1 3/4	1 1/16	3/4	1/4
1 1/2	610	0.45	1/8 x 1	1/8 x 1	3/8	2 13/16	2 13/16	2	2 1/16	7/8	1/4
2	610	0.50	1/8 x 1	1/8 x 1	3/8	3 1/16	4 1/2	2 1/4	2 1/16	1 1/8	1/4
2 1/2	1130	0.85	1/8 x 1 1/4	1/8 x 1 1/4	1/2	4 1/16	5 1/2	2 3/4	3 1/16	1 1/16	3/8
3	1130	0.95	1/8 x 1 1/4	1/8 x 1 1/4	1/2	4 13/16	6 1/16	3 3/4	3 13/16	1 3/16	3/8
3 1/2	1130	1.10	0.15 x 1 1/4	1/8 x 1 1/4	1/2	5 1/16	7 1/16	3 3/4	4 1/16	1 3/16	3/8
4	1430	1.35	0.15 x 1 1/4	0.15 x 1 1/4	5/8	5 5/16	7 7/16	3 3/4	4 1/4	1 1/16	3/8
5	1430	1.82	3/16 x 1 1/4	0.15 x 1 1/4	5/8	6 3/16	8 1/16	3 3/4	5 1/16	1 1/8	1/2
6	1940	2.74	3/16 x 1 1/2	3/16 x 1 1/2	3/4	6 1/16	10 1/16	3 3/4	5 1/16	1 1/8	1/2
8	2000	4.15	3/16 x 1 3/4	3/16 x 1 3/4	3/4	8 1/4	12 3/16	4	6 1/16	2 1/8	3/8
10	3600	7.25	1/4 x 1 3/4	1/4 x 1 3/4	7/8	9 3/8	15	4	8 1/16	1 3/8	3/8
12	3800	10.80	3/8 x 2	1/4 x 2	7/8	11 1/4	17 7/16	4 1/2	9 1/16	2 1/8	3/8
14	4200	12.40	3/8 x 2	1/4 x 2	1	12 3/16	19 1/16	5 1/4	10 1/16	2 1/8	3/8
16	4600	19.85	1/2 x 2 1/2	1/4 x 2 1/2	1	14	22	5 1/2	12	2 3/8	1
18	4800	22.25	1/2 x 2 1/2	1/4 x 2 1/2	1	15 1/16	24 1/16	6 1/2	13 1/16	3 1/8	1
20	4800	40.33	1/2 x 3	3/8 x 3	1 1/4	17 1/16	27 1/16	7	15 1/16	3 3/8	1 1/4
24	4800	49.83	5/8 x 3	3/8 x 3	1 1/4	19 13/16	31 1/16	7 1/4	17 1/16	3 3/8	1 1/4
30	6000	70.18	3/4 x 3	3/8 x 3	1 1/4	24 3/16	39 1/16	8 1/2	21 1/16	5 1/8	1 1/4

# Grinnell

## clevis

### adjustable clevis for insulated lines fig. 300



**SIZE RANGE:** 3/4 through 12 inch.

**MATERIAL:** fig. 300 – carbon steel.

**FINISH:** Black or galvanized.

**SERVICE:** Recommended for suspension of insulated, stationary pipe lines.

**MAXIMUM TEMPERATURE:** 650°F.

**APPROVALS:** Complies with Federal Specification WW-H-171 E (Type 1) and Manufacturers Standardization Society SP-69 (Type 1).

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

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

**FEATURES:**

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

**ORDERING:** Specify pipe size, figure number, name.

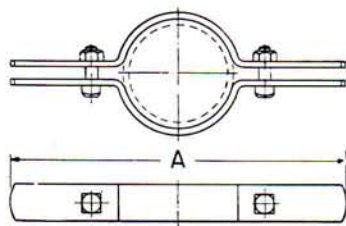
**loads • weights • dimensions (inches)**

pipe size	maximum recommended load, lb	weight (approx) lbs each	size of steel		A	B	C	D	E	adjustment F	G	H
			upper	lower								
3/4	610	.51	1/8 x 1	1/8 x 1	3/8	3 3/8	4 1/4	2 1/2	2 7/8	1/2	1/4	2
1	610	.58	1/8 x 1	1/8 x 1	3/8	4	4 11/16	2 1/2	3 1/4	5/8	1/4	2
1 1/4	610	.64	1/8 x 1	1/8 x 1	3/8	4 7/16	5 1/4	2 1/2	3 5/8	7/8	1/4	2
1 1/2	610	.72	1/8 x 1	1/8 x 1	3/8	4 3/4	5 3/4	2 1/2	4 1/16	1 1/16	1/4	2
2	610	.85	1/8 x 1	1/8 x 1	3/8	7 7/16	8 11/16	2 1/2	6 1/2	1 5/8	1/4	4
2 1/2	1130	1.9	3/16 x 1 1/4	3/16 x 1 1/4	1/2	8 7/16	9 15/16	3	7 1/2	2	3/8	4
3	1130	2.0	3/16 x 1 1/4	3/16 x 1 1/4	1/2	8 5/8	10 5/16	3	7 9/16	1 3/4	3/8	4
4	1430	2.5	1/4 x 1 1/4	3/16 x 1 1/4	5/8	9 3/8	11 5/8	3 1/2	8 3/16	1 5/16	3/8	4
5	1430	3.0	1/4 x 1 1/4	3/16 x 1 1/4	5/8	9 7/8	12 5/8	3 1/2	8 3/4	1 3/4	1/2	4
6	1940	3.4	1/4 x 1 1/2	3/16 x 1 1/2	3/4	10 5/8	14	4	9 3/8	1 7/8	1/2	4
8	2000	6.7	1/4 x 1 3/4	3/16 x 1 3/4	7/8	12 3/8	16 3/4	4	11	2	5/8	4
10	3600	11.0	3/8 x 1 3/4	1/4 x 1 3/4	7/8	13 3/4	19 3/16	4 1/2	12 1/4	2 1/8	3/4	4
12	3800	13.8	3/8 x 2	1/4 x 2	7/8	15 5/8	21 9/16	4 1/2	13 5/8	2 7/16	3/4	4



## steel pipe clamps

**extension pipe or riser clamp**  
fig. 261



**SIZE RANGE:**  $\frac{3}{4}$  through 24 inch.

**MATERIAL:** Carbon steel.

**FINISH:** Black or galvanized, furnished black unless otherwise specified.

**SERVICE:** For support and steadying of steel pipe risers either insulated or bare, cast iron pipe or conduit. Also supports pipe covering or insulation. This product is not intended for use with hanger rods. For this application refer to Fig. 40 Riser Clamp, page ph-15.

**MAXIMUM TEMPERATURE:** 650°F.

**APPROVALS:** Underwriters' Laboratories listed for 1/2 to 8 inch pipe. Complies with Federal Specification WW-H-171E (Type 8) and Manufacturers Standardization Society SP-69 (Type 8).

**INSTALLATION:** Clamp is fitted and bolted preferably below a coupling or welded lugs on steel pipe. Bolt torques should be per industry standards. Clamp is designed for standard steel pipe O.D. and this must be considered in sizing the riser for other types of piping. Install using maximum suggested torque values shown in technical data section page ph-169.

**ORDERING:** Specify pipe size, figure number, name, finish.

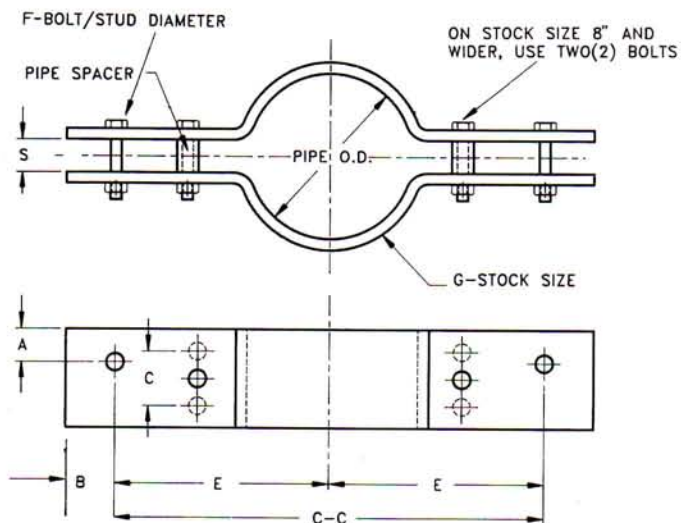
**loads • weights • dimensions (inches)**

pipe size	maximum recommended load, lb	wgt. (approx) lbs each	length A	size stock	size bolts
$\frac{3}{4}$	220	1.1	8 $\frac{1}{2}$	$\frac{3}{16}$ x 1	$\frac{3}{8}$ x 1 $\frac{1}{2}$
1	220	1.1	8 $\frac{1}{2}$	$\frac{3}{16}$ x 1	$\frac{3}{8}$ x 1 $\frac{1}{2}$
1 $\frac{1}{4}$	250	1.6	10	$\frac{3}{16}$ x 1	$\frac{3}{8}$ x 1 $\frac{1}{2}$
1 $\frac{1}{2}$	250	1.6	10 $\frac{1}{4}$	$\frac{3}{16}$ x 1	$\frac{3}{8}$ x 1 $\frac{1}{2}$
2	300	1.7	10 $\frac{1}{4}$	$\frac{3}{16}$ x 1	$\frac{7}{16}$ x 1 $\frac{1}{2}$
2 $\frac{1}{2}$	400	1.9	11 $\frac{1}{4}$	$\frac{1}{4}$ x 1	$\frac{7}{16}$ x 1 $\frac{1}{2}$
3	500	1.9	11 $\frac{1}{2}$	$\frac{1}{4}$ x 1	$\frac{7}{16}$ x 1 $\frac{1}{2}$
3 $\frac{1}{2}$	600	2.3	12 $\frac{1}{2}$	$\frac{1}{4}$ x 1	$\frac{1}{2}$ x 2
4	750	2.4	12 $\frac{1}{2}$	$\frac{1}{4}$ x 1	$\frac{1}{2}$ x 2
5	1500	3.6	13 $\frac{3}{4}$	$\frac{1}{4}$ x 1 $\frac{1}{2}$	$\frac{1}{2}$ x 2
6	1600	4.0	14 $\frac{1}{4}$	$\frac{1}{4}$ x 1 $\frac{1}{2}$	$\frac{1}{2}$ x 2
8	2500	7.6	18 $\frac{1}{2}$	$\frac{3}{8}$ x 1 $\frac{1}{2}$	$\frac{5}{8}$ x 2 $\frac{1}{2}$
10	2500	11.1	20 $\frac{1}{4}$	$\frac{3}{8}$ x 2	$\frac{5}{8}$ x 2 $\frac{1}{2}$
12	2700	16.5	22 $\frac{3}{4}$	$\frac{1}{2}$ x 2	$\frac{5}{8}$ x 2 $\frac{1}{2}$
14	2700	17.7	24	$\frac{1}{2}$ x 2	$\frac{5}{8}$ x 2 $\frac{1}{2}$
16	2900	30.4	26	$\frac{5}{8}$ x 2 $\frac{1}{2}$	$\frac{3}{4}$ x 3
18	2900	33.8	28	$\frac{5}{8}$ x 2 $\frac{1}{2}$	$\frac{3}{4}$ x 3
20	2900	35.0	30	$\frac{5}{8}$ x 2 $\frac{1}{2}$	$\frac{3}{4}$ x 3
24	3200	82.0	36 $\frac{1}{4}$	$\frac{3}{4}$ x 3	$\frac{7}{8}$ x 4

◆ Clamps may have square edges.

# Grinnell

## riser clamp - standard fig. 40



**SIZE RANGE:** 2" to 24".

**MATERIAL:** Carbon steel.

**FINISH:** Black or galvanized, furnished black unless otherwise specified.

**MAXIMUM TEMPERATURE:** 650°F.

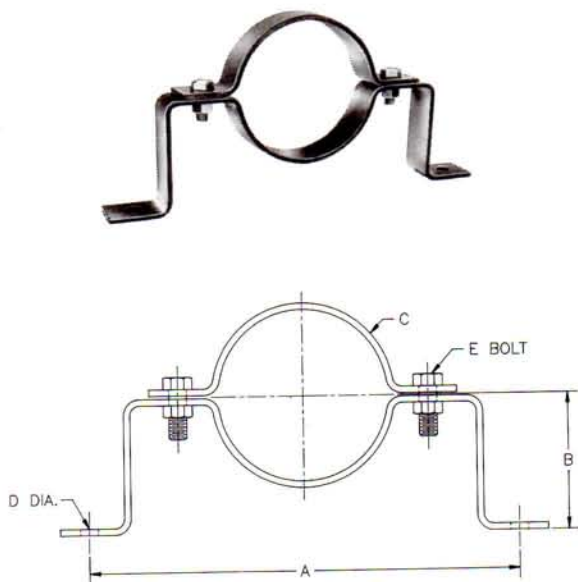
**SERVICE:** Riser Clamps are used for the support of vertical piping. Load is carried by shear lugs which are welded to the pipe. Shear lugs not provided.

**ORDERING:** Specify fig. 40 riser clamp pipe size, finish. Note: If maximum recommended loads are exceeded, refer to fig. 40-SD special design riser clamp.

pipe size	max. load rigid assy.	max. load spring assy.	C-C	E	F	G	S	A	B	C	wgt per 100
2	900	1800	18	9	3/8	1/2 x 2 1/2	3/8	1 1/4	2	---	1750
2 1/2	900	1800	20	10	3/8	1/2 x 2 1/2	3/8	1 1/4	2	---	1910
3	1500	3000	20	10	1/2	3/4 x 3	3/8	1 1/2	2	---	2940
4	2200	4400	22	11	1/2	3/4 x 3	3/8	1 1/2	2	---	3850
5	2200	4400	22	11	1/2	3/4 x 4	3/8	3/4	2	---	4320
6	3000	6000	24	12	3/4	3/4 x 4	1	3/4	2	---	5680
8	3000	6000	27	13 1/2	3/4	3/4 x 5	1	3/4	2	---	7920
10	5500	11000	30	15	7/8	1 x 6	1 1/2	1 1/4	2	---	14330
12	7800	15600	32	16	1	1 x 7	1 1/4	1 3/8	2 1/2	---	18370
14	7800	15600	34	17	1	1 x 7	1 1/4	1 3/8	2 1/2	---	19450
16	9000	18000	36	18	1 1/4	1 1/4 x 6	2	1 1/2	2 1/2	---	22470
18	9000	18000	39	19 1/2	1 1/4	1 1/4 x 7	2	1 1/2	2 1/2	---	28070
20	13500	27000	42	21	1 3/8	1 1/2 x 8	2 1/2	1 3/4	3	4	42910
24	13500	27000	45	22 1/2	1 3/8	1 1/2 x 8	2 1/2	1 3/4	3	4	46510

## steel pipe clamps

**offset pipe clamp**  
fig. 103



**SIZE RANGE:** ¼ through 8 inch.

**MATERIAL:** Carbon steel.

**FINISH:** Black or galvanized.

**SERVICE:** For use in supporting general piping away from wall or floor.

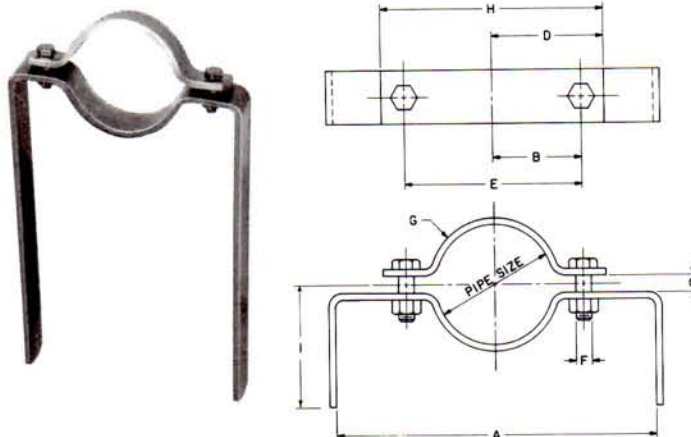
**MAXIMUM TEMPERATURE:** 650°F.

**ORDERING:** Specify pipe size, figure number, name.

**loads • weights • dimensions (inches)**

pipe size	max. recom. load, lb	weight (approx.) ea., lb.	A	B	C	D	E
¾	190	1.35	8 ¾	2 ½		7/16	¾ x 1
1	190	1.45	9 ¼	2 ¾			
1 ¼	190	1.55	9 ¾	2 13/16	¾ x 1 ¼		
1 ½	190	1.62	10	2 15/16			
2	420	2.79	11 ¼	3 3/16			
2 ½	420	2.90	11 ¾	3 7/16			
3	420	3.22	12 7/8	3 ¾	¼ x 1 ¼	9/16	½ x 1 ½
4	610	4.22	13 7/8	4 ¼	¼ x 1 ½		
5	610	6.50	15 5/8	4 ¾			
6	870	7.15	16 ¾	5 5/16	¼ x 2	1 1/16	5/8 x 1 ½
8	870	8.32	18 ¾	6 5/16			

**extended pipe clamp**  
fig. 100



**SIZE RANGE:** ¼ through 8 inch.

**MATERIAL:** Carbon steel.

**FINISH:** Black or galvanized.

**SERVICE:** For attachment to structure without use of rods.

**MAXIMUM TEMPERATURE:** 650°F.

**ORDERING:** Specify pipe size, figure number, name.

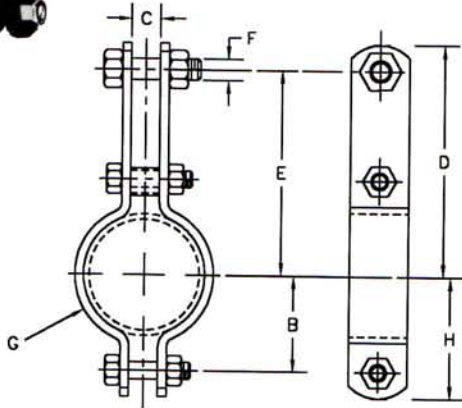
**dimensions (inches)**

pipe size	A	B	C	D	E	F	G	H	I	wgt. (approx.) ea. lb.
¾	5 7/8	1 9/16	1/8	2 ¼	3 1/8	3/8	¾ x 1 ¼	4 ½	12	2.20
1	6 3/8	1 13/16	1/8	2 ½	3 5/8	3/8	¾ x 1 ¼	5	12	2.25
1 ¼	6 7/8	2 1/16	1/8	2 ¾	4 1/8	3/8	¾ x 1 ¼	5 ½	12	2.34
1 ½	7 1/8	2 3/16	1/8	2 7/8	4 3/8	3/8	¾ x 1 ¼	5 ¾	12	2.39
2	8 3/8	2 9/16	1/8	3 1/16	5 1/8	1/2	¾ x 1 ¼	6 7/8	12	3.25
2 ½	8 7/8	2 13/16	1/8	3 11/16	5 5/8	1/2	¾ x 1 ¼	7 3/8	12	3.40
3	10	3 3/8	1/8	4 1/8	6 ¾	1/2	¾ x 1 ¼	8 ¼	12	3.58
4	10 5/8	3 11/16	1/8	4 9/16	7 3/8	1/2	¾ x 1 ½	9 1/8	12	4.74
5	12 3/8	4 5/16	1/8	5 7/16	8 5/8	5/8	¾ x 2	10 7/8	12	5.09
6	13 ½	4 7/8	1/8	6	9 ¾	5/8	¾ x 2	12	12	8.23
8	15 ½	5 7/8	1/8	7	11 ¾	5/8	¾ x 2	14	12	9.25

# Grinnell

## steel pipe clamps

### double bolt pipe clamp fig. 295



**SIZE RANGE:** ¾ through 36 inch.

**MATERIAL:** Carbon steel.

**FINISH:** Black or galvanized, furnished black unless otherwise specified.

**SERVICE:** Recommended for suspension of pipe requiring insulation and where flexibility of the clamp is desirable – within the limitation of temperature and loads shown below.

**MAXIMUM TEMPERATURE:** 750°F.

**APPROVALS:** Complies with Federal Specification WW-H-171E (Type 3) and Manufacturers Standardization Society SP-69 (Type 3).

**INSTALLATION:** Attachment to the clamp may be made with a welded eye rod fig. 278, page ph-57 or the weldless eye nut fig. 290, page ph-64.

**FEATURES:**

- Accommodates up to 4" thick insulation.
- Load ratings meet ASME code requirements and are substantiated by laboratory test.

**ORDERING:** Specify pipe size, figure number, name, finish.

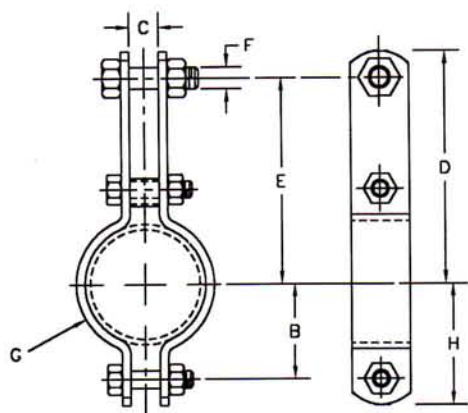
**loads • weights • dimensions (inches)**

pipe size	max recom load, lbs for service temp		wgt (approx) lbs each	B	C	D	rod take out E	F	G	H
	650°F	750°F								
¾	950	...	.70	15/16	5/8	27/8	27/16	3/8	3/16 x 1	13/8
1	950	...	.76	11/16	5/8	3	29/16	3/8	3/16 x 1	1½
1¼	950	...	.81	1¼	5/8	33/8	211/16	3/8	3/16 x 1	111/16
1½	1545	1380	2.3	113/16	11/16	47/8	41/8	5/8	¼ x 1¼	23/8
2	1545	1380	2.6	21/8	11/16	57/8	51/8	5/8	¼ x 1¼	211/16
2½	1545	1380	2.7	25/16	11/16	61/8	53/8	5/8	¼ x 1¼	215/16
3	1545	1380	3.0	2¾	11/16	611/16	515/16	5/8	¼ x 1¼	3½
4	2500	2230	6.7	3¾	11/16	77/8	6½	¾	5/16 x 2	4½
5	2500	2230	7.0	315/16	11/16	81/8	7	¾	5/16 x 2	5
6	2865	2555	11.5	4¾	17/16	911/16	89/16	7/8	¾ x 2½	61/8
8	2865	2555	13.2	5¾	17/16	1011/16	99/16	7/8	¾ x 2½	71/8
10	3240	2890	19.8	67/8	17/16	12	107/16	1	½ x 2½	8¼
12	3240	2890	22.3	77/8	17/16	13	117/16	1	½ x 2½	9¼
14	4300	3835	37.7	91/16	2	145/16	1211/16	1¼	5/8 x 3	1011/16
16	4300	3835	41.4	101/16	2	155/16	1311/16	1¼	5/8 x 3	1111/16
18	4300	3835	44.9	111/16	2	165/16	1411/16	1¼	5/8 x 3	1211/16
20	5490	4900	57.3	12¾	2	175/8	157/8	1¾	¾ x 3	14
24	4500	4015	65.9	14¾	2	195/8	177/8	1¾	¾ x 3	16
28	6000	...	112.3	17½	2¼	24¼	21¾	1¼	¾ x 4	20
30	7500	...	150.0	18½	2½	261/8	23¾	1¾	¾ x 5	21¼
32	8250	...	193.3	19¾	2½	28	25	1½	¾ x 6	225/8
34	9800	...	248.8	21½	3	31¼	27¾	1¾	1 x 5	25
36	10500	...	257.5	22½	3	32¼	28¾	1¾	1 x 5	26

■ Based on the allowable stresses shown in the ASME Code for Pressure Piping. Larger sizes may have square edges.

## steel pipe clamps

### alloy double bolt pipe clamp fig. 295A



**SIZE RANGE:** 1½ through 24 inch.

**MATERIAL:** Chrome molybdenum steel (ASTM A-387 Grade 22).

**SERVICE:** Recommended for suspension of high temperature pipe requiring insulation.

**MAXIMUM TEMPERATURE:** 1050°F.

**APPROVALS:** Complies with Federal Specification WW-H-171E (Type 3) and Manufacturers Standardization Society SP-69 (Type 3).

**FEATURES:**

- Accommodates up to 4" thick insulation.
- Load ratings meet ASME code requirements and are substantiated by laboratory test.

**ORDERING:** Specify pipe size, figure number, name.

- Note: Galvanizing is not recommended for alloy products.

#### loads • weights • dimensions (inches)

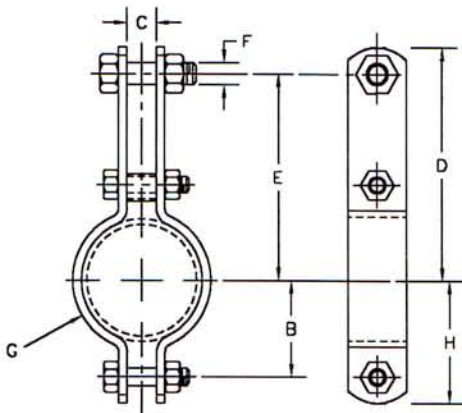
pipe size	maximum recommended load, lbs for service temperature				wgt (approx) lbs each	B	C	D	rod take out E	F	G	H
	650°F	750°F	1000°F	1050°F								
1½	1545	1410	1000	745	2.3	1 13/16	1 1/16	4 7/8	4 7/8	3/4	¼ x 1 ¼	2 3/8
2	1545	1410	1000	745	2.6	2 1/4	1 1/16	5 5/8	5 5/8	3/4	¼ x 1 ¼	2 11/16
2½	1545	1410	1000	745	2.7	2 5/8	1 1/16	6 1/8	5 5/8	3/4	¼ x 1 ¼	2 15/16
3	1545	1410	1000	745	3.0	2 3/4	1 1/16	6 11/16	5 15/16	3/4	¼ x 1 ¼	3 1/2
4	2500	2290	1625	1200	6.7	3 3/8	1 1/16	7 7/8	6 1/2	3/4	3/8 x 2	4 1/2
5	2500	2290	1625	1200	7.0	3 13/16	1 1/16	8 3/8	7	3/4	3/8 x 2	5
6	2865	2620	1860	1380	11.5	4 3/4	1 1/16	9 15/16	8 3/8	7/8	3/8 x 2 1/2	6 1/8
8	2865	2620	1860	1380	13.2	5 3/4	1 1/16	10 15/16	9 9/16	7/8	3/8 x 2 1/2	7 7/8
10	3240	2970	2100	1565	19.8	7 7/16	1 1/16	12	10 3/8	1	1/2 x 2 1/2	8 3/4
12	3240	2970	2095	1555	22.3	8 1/16	1 1/16	12 15/16	11 3/8	1	1/2 x 2 1/2	9 9/16
14	4300	3915	2795	2060	37.7	9 9/16	2	14 3/16	12 11/16	1 1/4	5/8 x 3	10 11/16
16	4300	3915	2795	2060	41.4	10 1/16	2	15 5/16	13 11/16	1 1/4	5/8 x 3	11 11/16
18	4300	3915	2780	2060	44.9	11 1/16	2	16 3/16	14 11/16	1 1/4	5/8 x 3	12 11/16
20	5490	4995	3550	2635	57.3	12 3/8	2	17 1/2	15 7/8	1 3/8	3/4 x 3	14
24	4500	4095	2910	2160	65.9	14 3/8	2	19 1/2	17 7/8	1 3/8	3/4 x 3	16

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

# Grinnell

## steel pipe clamps

heavy duty double bolt  
pipe clamp  
fig. 295H



**SIZE RANGE:** 6 through 36 inch.

**MATERIAL:** Carbon steel.

**FINISH:** Black.

**SERVICE:** Recommended for suspension of pipe requiring up to 4 inches of insulation and where flexibility of the clamp is desirable.

**MAXIMUM TEMPERATURE:** 750°F.

**APPROVALS:** Complies with Federal Specification WW-H-171E (Type 3) and Manufacturers Standardization Society SP-69 (Type 3).

**FEATURES:**

- Accommodates up to 4" thick insulation.
- Load ratings meet ASME code requirements and are substantiated by laboratory test.

**ORDERING:** Specify pipe size, figure number, name.

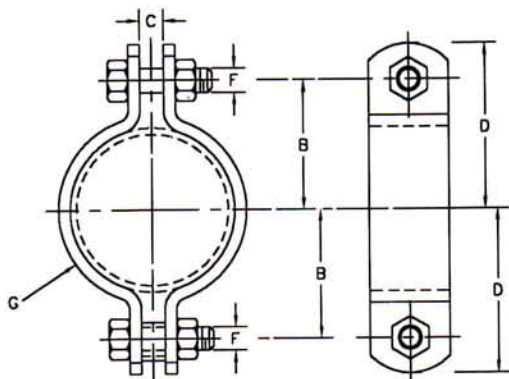
**loads • weights • dimensions (inches)**

pipe size in.	maximum recommended load, lb= for service temperature		wgt (app'x) lbs each	B	C	D	rod take out E	F	G	H
	650°F	750°F								
6	3500	3125	12.0	4 <sup>3</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>4</sub>	10 <sup>3</sup> / <sub>16</sub>	8 <sup>15</sup> / <sub>16</sub>	1	3 <sup>5</sup> / <sub>8</sub> x 2 <sup>1</sup> / <sub>2</sub>	6
8	4800	4285	18.5	6	2	11 <sup>3</sup> / <sub>8</sub>	10 <sup>5</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>2</sub> x 2 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>4</sub>
10	5500	4910	30.3	7 <sup>1</sup> / <sub>4</sub>	2 <sup>1</sup> / <sub>4</sub>	13 <sup>3</sup> / <sub>8</sub>	11 <sup>3</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>2</sub> x 3 <sup>1</sup> / <sub>2</sub>	9
12	7000	6250	42.0	8 <sup>5</sup> / <sub>8</sub>	2 <sup>1</sup> / <sub>2</sub>	14 <sup>5</sup> / <sub>16</sub>	12 <sup>9</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>8</sub>	5 <sup>5</sup> / <sub>8</sub> x 3 <sup>1</sup> / <sub>2</sub>	10 <sup>3</sup> / <sub>8</sub>
14	9500	8485	60.0	9 <sup>5</sup> / <sub>8</sub>	2 <sup>1</sup> / <sub>2</sub>	15 <sup>1</sup> / <sub>2</sub>	13 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>2</sub>	3 <sup>1</sup> / <sub>4</sub> x 4	11 <sup>5</sup> / <sub>8</sub>
16	10000	8930	80.0	10 <sup>7</sup> / <sub>8</sub>	3	17 <sup>1</sup> / <sub>8</sub>	14 <sup>7</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>4</sub> x 4 <sup>1</sup> / <sub>2</sub>	13 <sup>5</sup> / <sub>8</sub>
18	13800	12325	115.0	12 <sup>1</sup> / <sub>2</sub>	3 <sup>1</sup> / <sub>2</sub>	18 <sup>1</sup> / <sub>4</sub>	16 <sup>1</sup> / <sub>4</sub>	2	1 x 4	14 <sup>1</sup> / <sub>2</sub>
20	15300	13665	140.0	13 <sup>1</sup> / <sub>2</sub>	3 <sup>1</sup> / <sub>2</sub>	19 <sup>3</sup> / <sub>4</sub>	17 <sup>1</sup> / <sub>4</sub>	2	1 x 5	16
24	16300	14555	190.0	15 <sup>1</sup> / <sub>2</sub>	3 <sup>1</sup> / <sub>2</sub>	22 <sup>5</sup> / <sub>16</sub>	19 <sup>5</sup> / <sub>16</sub>	2	1 x 6	18 <sup>1</sup> / <sub>2</sub>
28	18000	...	354.0	18 <sup>7</sup> / <sub>8</sub>	4	31 <sup>3</sup> / <sub>4</sub>	27 <sup>1</sup> / <sub>4</sub>	2 <sup>1</sup> / <sub>4</sub>	1 x 7	23 <sup>3</sup> / <sub>8</sub>
30	20500	...	406.0	19 <sup>7</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>4</sub>	32 <sup>3</sup> / <sub>4</sub>	28 <sup>1</sup> / <sub>4</sub>	2 <sup>1</sup> / <sub>4</sub>	1 x 8	24 <sup>3</sup> / <sub>8</sub>
32	23750	...	555.0	21 <sup>3</sup> / <sub>4</sub>	4 <sup>1</sup> / <sub>4</sub>	36	31	2 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>4</sub> x 8	26 <sup>3</sup> / <sub>4</sub>
34	25000	...	604.0	23 <sup>3</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>4</sub>	37 <sup>1</sup> / <sub>2</sub>	32 <sup>1</sup> / <sub>2</sub>	2 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>2</sub> x 7	28 <sup>3</sup> / <sub>8</sub>
36	28000	...	678.0	24 <sup>5</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>	40 <sup>1</sup> / <sub>4</sub>	34 <sup>3</sup> / <sub>4</sub>	2 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>2</sub> x 8	30 <sup>5</sup> / <sub>8</sub>

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

## steel pipe clamps

heavy pipe clamp  
fig. 216



**SIZE RANGE:** 3 through 42 inch.

**MATERIAL:** Carbon steel.

**FINISH:** Black or galvanized.

**SERVICE:** Recommended for suspension of heavy loads where little or no insulation is required.

**MAXIMUM TEMPERATURE:** 750°F.

**APPROVALS:** Complies with Federal Specification WW-H-171E (Type 4) and Manufacturers Standardization Society SP-69 (Type 4).

**INSTALLATION:** Normally used with eye rod or with weldless eye nut fig. 290, page ph-64.

**FEATURES:**

- Load ratings meet ASME code requirements and are substantiated by laboratory test.
- Designed for heavy loads in temperature up to 750°F.

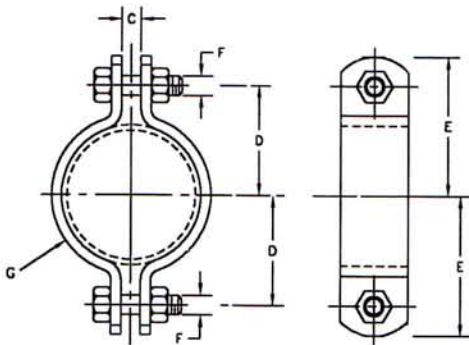
**ORDERING:** Specify pipe size, figure number, name, finish.

loads • weights • dimensions (inches)

pipe size	max recom load, lb# for service temperature		wgt (approx) lbs each	B	C	D	rod take out E	F	G	H
	650°F	750°F								
3	3370	3005	3.6	2 <sup>15</sup> / <sub>16</sub>	1	4	3 <sup>1</sup> / <sub>8</sub>	3/4	5/16 x 2	3 <sup>13</sup> / <sub>16</sub>
4	3515	3135	5.5	3 <sup>9</sup> / <sub>16</sub>	1	4 <sup>7</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>4</sub>	7/8	3/8 x 2	4 <sup>11</sup> / <sub>16</sub>
5	3515	3135	6.3	4 <sup>1</sup> / <sub>8</sub>	1	5 <sup>1</sup> / <sub>2</sub>	4 <sup>3</sup> / <sub>8</sub>	7/8	3/8 x 2	5 <sup>1</sup> / <sub>4</sub>
6	4865	4340	11.7	5	1 <sup>1</sup> / <sub>8</sub>	6 <sup>5</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>4</sub>	1	1/2 x 2 <sup>1</sup> / <sub>2</sub>	6 <sup>3</sup> / <sub>8</sub>
8	4865	4340	13.9	6 <sup>1</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>8</sub>	7 <sup>5</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>4</sub>	1	1/2 x 2 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>2</sub>
10	6010	5360	22.3	7 <sup>9</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>4</sub>	9 <sup>1</sup> / <sub>16</sub>	7 <sup>11</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>4</sub>	5/8 x 2 <sup>1</sup> / <sub>2</sub>	8 <sup>15</sup> / <sub>16</sub>
12	8675	7740	38.1	9	1 <sup>5</sup> / <sub>8</sub>	10 <sup>7</sup> / <sub>8</sub>	9 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>2</sub>	3/4 x 3	10 <sup>5</sup> / <sub>8</sub>
14	9120	8135	46.8	9 <sup>3</sup> / <sub>4</sub>	1 <sup>5</sup> / <sub>8</sub>	11 <sup>7</sup> / <sub>8</sub>	10	1 <sup>1</sup> / <sub>2</sub>	3/4 x 3 <sup>1</sup> / <sub>2</sub>	11 <sup>5</sup> / <sub>8</sub>
16	9120	8135	51.4	10 <sup>3</sup> / <sub>4</sub>	1 <sup>5</sup> / <sub>8</sub>	12 <sup>7</sup> / <sub>8</sub>	11	1 <sup>1</sup> / <sub>2</sub>	3/4 x 3 <sup>1</sup> / <sub>2</sub>	12 <sup>5</sup> / <sub>8</sub>
18	13800	...	130.1	14 <sup>1</sup> / <sub>2</sub>	3	17 <sup>1</sup> / <sub>4</sub>	14 <sup>1</sup> / <sub>2</sub>	2	3/4 x 6	17 <sup>1</sup> / <sub>4</sub>
20	15300	...	163.6	16	3	18 <sup>3</sup> / <sub>4</sub>	16	2	1 x 5	18 <sup>3</sup> / <sub>4</sub>
24	16300	...	215.2	18 <sup>1</sup> / <sub>2</sub>	3 <sup>1</sup> / <sub>4</sub>	21 <sup>1</sup> / <sub>2</sub>	18 <sup>1</sup> / <sub>2</sub>	2 <sup>1</sup> / <sub>4</sub>	1 x 6	21 <sup>1</sup> / <sub>2</sub>
28	18000	...	302.8	20 <sup>1</sup> / <sub>2</sub>	3 <sup>1</sup> / <sub>4</sub>	23 <sup>1</sup> / <sub>2</sub>	20 <sup>1</sup> / <sub>2</sub>	2 <sup>1</sup> / <sub>4</sub>	1 x 8	23 <sup>1</sup> / <sub>2</sub>
30	20500	...	365.4	22 <sup>1</sup> / <sub>2</sub>	3 <sup>1</sup> / <sub>2</sub>	26	22 <sup>1</sup> / <sub>2</sub>	2 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>4</sub> x 7	26
32	23750	...	431.7	23 <sup>1</sup> / <sub>2</sub>	3 <sup>1</sup> / <sub>2</sub>	27	23 <sup>1</sup> / <sub>2</sub>	2 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>4</sub> x 8	27
34	25000	...	533.8	25	3 <sup>1</sup> / <sub>2</sub>	28 <sup>1</sup> / <sub>2</sub>	25	2 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>2</sub> x 8	28 <sup>1</sup> / <sub>2</sub>
36	28000	...	575.1	26 <sup>1</sup> / <sub>2</sub>	3 <sup>1</sup> / <sub>2</sub>	30 <sup>1</sup> / <sub>4</sub>	26 <sup>1</sup> / <sub>2</sub>	2 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>2</sub> x 8	30 <sup>1</sup> / <sub>4</sub>
42	35000	...	915.7	30	3 <sup>1</sup> / <sub>2</sub>	33 <sup>3</sup> / <sub>4</sub>	30	2 <sup>3</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>4</sub> x 10	33 <sup>3</sup> / <sub>4</sub>

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

## medium pipe clamp fig. 212



**SIZE RANGE:** 1/2 through 30 inch.

**MATERIAL:** Carbon steel.

**FINISH:** Black or galvanized; furnished black unless otherwise specified.

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

**MAXIMUM TEMPERATURE:** 750°F.

**APPROVALS:** Underwriters' Laboratories listed and Factory Mutual approved for 3/4 through 8 inch pipe. Complies with Federal Specification WW-H-171E (Type 4) and Manufacturers Standardization Society SP-69 (Type 4).

**INSTALLATION:** Normally used with weldless eye nut fig. 290, page ph-64 or eye rod.

**FEATURES:**

- Load ratings meet ASME code requirements and are substantiated by laboratory test.
- Clamps tightly to pipe.
- Wide range of sizes.

**ORDERING:** Specify pipe size, figure number, name, finish.

**loads • weights • dimensions (inches)**

pipe size	max recom load, lbs for service temperature		wgt (approx) lbs each	C	rod take-out D	E	F	G
	650°F	750°F						
1/2	500	...	.29	3/8	1 1/8	1 1/2	3/8	1/2 x 1
3/4	500	...	.33	3/8	1 3/8	1 3/4	3/8	1/2 x 1
1	500	...	.35	3/8	1 1/2	1 3/4	3/8	1/2 x 1
1 1/4	500	...	.38	3/8	1 5/8	1 3/4	3/8	1/2 x 1
1 1/2	800	...	.43	3/8	1 3/4	2 1/4	3/8	1/2 x 1
2	1040	930	1.1	3/8	2 1/8	2 3/4	1/2	1/4 x 1
2 1/2	1040	930	1.2	3/8	2 3/8	3 1/4	1/2	1/4 x 1
3	1040	930	1.4	3/8	2 5/8	3 3/8	1/2	1/4 x 1
3 1/2	1040	930	1.5	3/8	3 1/8	3 3/8	1/2	1/4 x 1
4	1040	930	2.3	3/8	3 3/8	4 3/8	5/8	1/4 x 1 1/4
5	1040	930	2.6	3/8	4 1/8	4 5/8	5/8	1/4 x 1 1/4
6	1615	1440	5.4	1/2	5	5 3/8	3/4	3/8 x 1 1/2
8	1615	1440	6.5	1/2	6 1/8	7	3/4	3/8 x 1 1/2
10	2490	2220	13.6	5/8	7 1/8	8 1/8	7/8	1/2 x 2
12	2490	2220	15.2	5/8	8 1/8	9 1/8	7/8	1/2 x 2
14	2490	2220	20.5	5/8	9 1/4	10 3/8	7/8	1/2 x 2 1/2
16	2490	2220	22.3	5/8	10 1/4	11 3/8	7/8	1/2 x 2 1/2
18	3060	2730	31.6	5/8	11 3/8	13	1	5/8 x 2 1/2
20	3060	2730	35.8	3/4	12 3/4	14 1/8	1 1/8	5/8 x 2 1/2
24	3060	2730	53.1	3/4	15 1/4	16 1/8	1 1/4	5/8 x 3
30	3500	3360	113.9	1	19	21 1/8	1 3/4	3/4 x 4

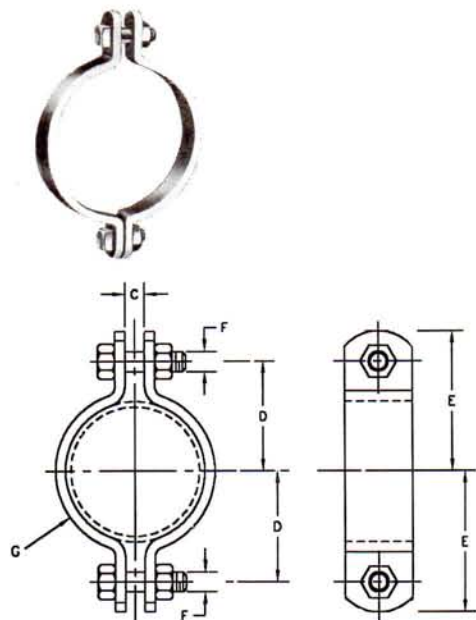
■ Based on the allowable stresses shown in the ASME Code for Pressure Piping.

♦ Clamps may be furnished with square ends.



## steel pipe clamps

**earthquake bracing clamp**  
**fig. 212FP**



**SIZE RANGE:** 2 through 8 inch.

**MATERIAL:** Carbon steel.

**FINISH:** Black or galvanized; furnished black unless otherwise specified.

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

**MAXIMUM TEMPERATURE:** 750°F.

**INSTALLATION:** Designed for use with Fig. 113 brace fitting, page ph-41.

**ORDERING:** Order by pipe size, figure number, name, finish if other than black, finish.

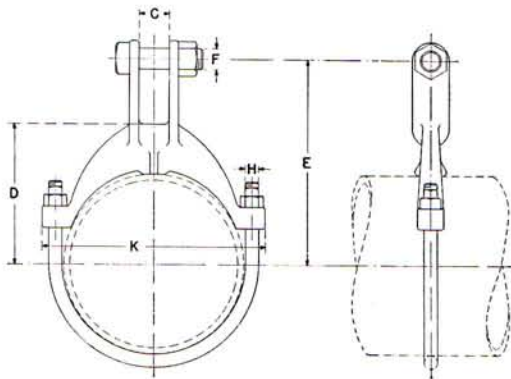
**loads • weights • dimensions (inches)**

pipe size	max recom load, lbs for service temperature		wgt (approx) lbs each	C	rod take-out D	E	F	G
	650°F	750°F						
2	1040	930	1.1	$\frac{3}{8}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{4}$ x 1
2 $\frac{1}{2}$	1040	930	1.2	$\frac{3}{8}$	2 $\frac{1}{2}$	3 $\frac{1}{4}$	$\frac{1}{2}$	$\frac{1}{4}$ x 1
3	1040	930	1.4	$\frac{3}{8}$	2 $\frac{5}{16}$	3 $\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$ x 1
3 $\frac{1}{2}$	1040	930	1.5	$\frac{3}{8}$	3 $\frac{1}{16}$	3 $\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{4}$ x 1
4	1040	930	2.2	$\frac{3}{8}$	3 $\frac{1}{2}$	4 $\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{4}$ x 1 $\frac{1}{4}$
5	1040	930	2.5	$\frac{3}{8}$	4 $\frac{1}{16}$	4 $\frac{5}{16}$	$\frac{1}{2}$	$\frac{1}{4}$ x 1 $\frac{1}{4}$
6	1040	930	5.2	$\frac{1}{2}$	5	5 $\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$ x 1 $\frac{1}{2}$
8	1040	930	6.3	$\frac{1}{2}$	6 $\frac{1}{2}$	7	$\frac{1}{2}$	$\frac{3}{8}$ x 1 $\frac{1}{2}$

# Grinnell

## steel pipe clamps

### alloy steel pipe clamp fig. 224



**SIZE RANGE:** 4 through 16 inch.

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

**SPECIFICATIONS:** Load ratings are substantiated by laboratory test.

**SERVICE:** Recommended for suspension of high temperature pipe requiring up to 4 inches of insulation.

**MAXIMUM TEMPERATURE:** 1050°F.

**APPROVALS:** Complies with Federal Specification WW-H-171E (Type 2) and Manufacturers Standardization Society SP-69 (Type 2).

**INSTALLATION:**

- (1) Normally used with weldless eye rod fig. 278, page ph-57, or weldless eye nut fig. 290, page ph-64.
- (2) Remove U-bolt from clamp to install on pipe.

**FEATURES:**

- Designed for the support of loads at temperatures up to 1050°F.
- Designed to satisfy most critical engineering specifications.
- Yoke has rugged cross sectional area, eliminating high stress conditions.
- When used on pipe with 4 inches of insulation the top bolt is outside of the insulation.

**ORDERING:** Specify pipe size, figure number, name.

**NOTE:** Optional distribution plates available on request.

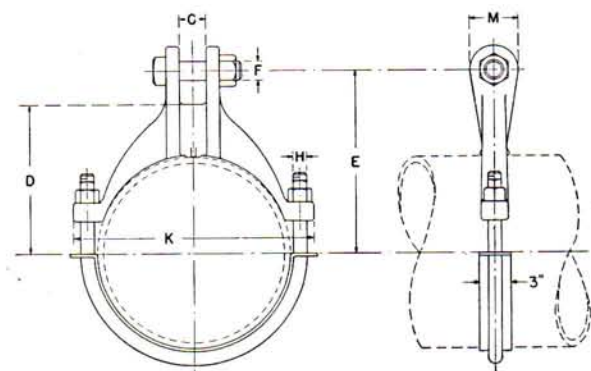
**loads • weights • dimensions (inches)**

pipe size	maximum recommended load, lbs				wgt (approx) lbs each	C	D	rod take out E	F	H	K
	@ 750°F	@ 950°F	@ 1000°F	@ 1050°F							
4	3780	3300	2770	1890	4.0	1 <sup>1</sup> / <sub>16</sub>	3 <sup>7</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>	<sup>7</sup> / <sub>8</sub>	<sup>1</sup> / <sub>2</sub>	6 <sup>1</sup> / <sub>2</sub>
6	6060	5290	4440	3030	7.5	1 <sup>7</sup> / <sub>16</sub>	5 <sup>7</sup> / <sub>16</sub>	8 <sup>5</sup> / <sub>16</sub>	1	<sup>5</sup> / <sub>8</sub>	9 <sup>1</sup> / <sub>8</sub>
8	6060	5290	4440	3030	9.0	1 <sup>7</sup> / <sub>16</sub>	6 <sup>11</sup> / <sub>16</sub>	9 <sup>9</sup> / <sub>16</sub>	1	<sup>5</sup> / <sub>8</sub>	11 <sup>1</sup> / <sub>8</sub>
10	9060	7910	6640	4420	15.8	1 <sup>7</sup> / <sub>16</sub>	8 <sup>3</sup> / <sub>8</sub>	10 <sup>7</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>8</sub>	<sup>3</sup> / <sub>4</sub>	13 <sup>5</sup> / <sub>8</sub>
12	12570	10980	9015	6010	24.3	1 <sup>15</sup> / <sub>16</sub>	10 <sup>1</sup> / <sub>8</sub>	12 <sup>7</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>2</sub>	<sup>7</sup> / <sub>8</sub>	16 <sup>1</sup> / <sub>8</sub>
14	12570	10980	9015	6010	26.3	1 <sup>15</sup> / <sub>16</sub>	11 <sup>1</sup> / <sub>8</sub>	13 <sup>7</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>2</sub>	<sup>7</sup> / <sub>8</sub>	17 <sup>3</sup> / <sub>8</sub>
16	12570	10980	9015	6010	31.0	1 <sup>15</sup> / <sub>16</sub>	12 <sup>1</sup> / <sub>4</sub>	15	1 <sup>1</sup> / <sub>2</sub>	<sup>7</sup> / <sub>8</sub>	19 <sup>5</sup> / <sub>8</sub>

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

## steel pipe clamps

### heavy duty alloy steel pipe clamp: fig. 246



**SIZE RANGE:** 10 through 24 inch.

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

**SPECIFICATIONS:** Load ratings are substantiated by laboratory test.

**SERVICE:** Recommended for suspension of high temperature pipe requiring up to 6 inches of insulation.

**MAXIMUM TEMPERATURE:** 1075°F.

**APPROVALS:** Complies with Federal Specification WW-H-171E (Type 2) and Manufacturers Standardization Society SP-69 (Type 2).

**INSTALLATION:** Normally used with welded eye rod fig. 278, page ph-57, or weldless eye nut fig. 290, page ph-64.

**FEATURES:**

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

**ORDERING:** Specify nominal pipe size and exact O.D. of pipe, figure number, name. Special alloy filler plates will be provided, at an extra charge, when the O.D. of the pipe size is other than standard. Installation instructions are attached to the clamp when the filler plates are required.

### loads • weights • dimensions (inches)

nom. pipe size	used on O.D. pipe size	maximum recommended load, lb <sup>a</sup>				wgt (approx) lbs each <sup>▲</sup>	C	D	rod take out E	F	H	K	M
		@ 950°F	@ 1000°F	@ 1050°F	@ 1075°F								
10	8 <sup>3</sup> / <sub>4</sub> -10 <sup>13</sup> / <sub>16</sub>	13500	11780	7850	6120	42.0	2	9 <sup>1</sup> / <sub>8</sub>	12	1 <sup>1</sup> / <sub>2</sub>	1	15 <sup>3</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>4</sub>
12	10 <sup>7</sup> / <sub>8</sub> -12 <sup>13</sup> / <sub>16</sub>	16500	14910	9940	7750	58.0	2 <sup>1</sup> / <sub>4</sub>	10 <sup>3</sup> / <sub>4</sub>	13 <sup>3</sup> / <sub>4</sub>	1 <sup>5</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>4</sub>	17 <sup>7</sup> / <sub>8</sub>	4
14	12 <sup>7</sup> / <sub>8</sub> -14 <sup>1</sup> / <sub>16</sub>	16500	14910	9940	7750	63.0	2 <sup>1</sup> / <sub>4</sub>	11 <sup>1</sup> / <sub>2</sub>	14 <sup>1</sup> / <sub>2</sub>	1 <sup>5</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>4</sub>	19 <sup>1</sup> / <sub>8</sub>	4
16	14 <sup>1</sup> / <sub>8</sub> -16 <sup>1</sup> / <sub>16</sub>	16500	14910	9940	7750	69.0	2 <sup>1</sup> / <sub>4</sub>	13 <sup>3</sup> / <sub>8</sub>	16 <sup>3</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>4</sub>	21 <sup>1</sup> / <sub>8</sub>	4
18	16 <sup>1</sup> / <sub>8</sub> -18 <sup>1</sup> / <sub>16</sub>	19000	18410	12270	9570	94.0	2 <sup>1</sup> / <sub>2</sub>	14 <sup>1</sup> / <sub>2</sub>	18 <sup>1</sup> / <sub>4</sub>	2	1 <sup>1</sup> / <sub>4</sub>	24 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
20	18 <sup>1</sup> / <sub>8</sub> -20 <sup>1</sup> / <sub>16</sub>	19000	18410	12270	9570	104.0	2 <sup>1</sup> / <sub>2</sub>	15 <sup>3</sup> / <sub>4</sub>	19 <sup>1</sup> / <sub>2</sub>	2	1 <sup>1</sup> / <sub>4</sub>	26 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>2</sub>
24	20 <sup>1</sup> / <sub>8</sub> -24 <sup>1</sup> / <sub>16</sub>	25000	22280	14850	11580	167.0	3	18 <sup>1</sup> / <sub>4</sub>	22	2 <sup>1</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>8</sub>	30 <sup>3</sup> / <sub>4</sub>	6

<sup>a</sup> Based on the allowable stresses shown in the ANSI Code for Pressure Piping.

Overtightening of nuts may overstress U-bolts reducing the load rating. Installation tag attached to clamp gives proper nut tightening.

<sup>▲</sup> This weight does not include filler plates required on non-standard pipe sizes.

# Grinnell

## socket clamps

socket clamp

fig. 595

socket clamp washer

fig. 594



**SIZE RANGE:** 4 through 24 inch.

**MATERIAL:** Two carbon steel half bands and four bolts and nuts.

**FINISH:** Black or galvanized; furnished black unless otherwise specified.

**SERVICE:** Clamps mechanical joint piping or mechanical joint or socket joint fittings together thus stopping separation or distortion of pipe line under excessive water pressure.

**APPROVALS:** Complies with the requirements of the National Fire Protection Association Standard NFPA-24 for Outside Protection.

**ORDERING:** Specify size, figure, number, name.

### socket clamp washer

Two cast iron washers, fig. 594, are used with each socket clamp and these must be ordered separately.

**ORDERING:** Specify washer size, figure number, name.

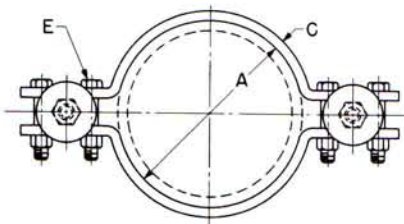
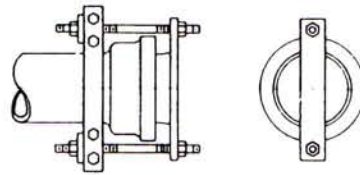
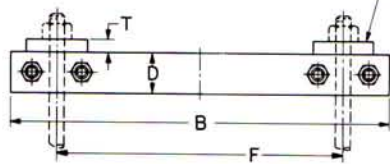
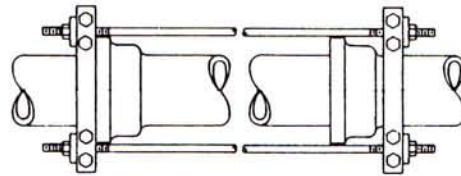


FIG. 594 WASHER  
ORDER SEPARATELY



plug strap for  
bell end of pipe



pipe anchor

### loads • weights • dimensions (inches)

pipe size	max test pressure, p.s.i.	force* on clamp, lb.	weight (approx) lbs each		A	B	C	D	bolt E	F	T	washer size
			clamp	washer								
4	250	4550	12.8	1.1	5	14 $\frac{5}{8}$	$\frac{1}{2}$	2	$\frac{5}{8}$ x 3 $\frac{1}{2}$	9 $\frac{5}{8}$	$\frac{5}{8}$	$\frac{3}{4}$
6	250	9340	14.6	1.1	7 $\frac{1}{8}$	16 $\frac{7}{8}$	$\frac{1}{2}$	2	$\frac{5}{8}$ x 3 $\frac{1}{2}$	11 $\frac{7}{8}$	$\frac{5}{8}$	$\frac{3}{4}$
8	250	16080	23.6	1.1	9 $\frac{5}{16}$	19 $\frac{1}{8}$	$\frac{5}{8}$	2 $\frac{1}{2}$	$\frac{5}{8}$ x 3 $\frac{3}{4}$	14 $\frac{1}{8}$	$\frac{5}{8}$	$\frac{3}{4}$
10	250	24180	29.3	1.7	11 $\frac{1}{2}$	21 $\frac{3}{8}$	$\frac{5}{8}$	2 $\frac{1}{2}$	$\frac{3}{4}$ x 3 $\frac{3}{4}$	16 $\frac{3}{8}$	$\frac{3}{4}$	1
12	250	34230	40.3	1.7	13 $\frac{1}{2}$	25 $\frac{1}{8}$	$\frac{5}{8}$	3	$\frac{7}{8}$ x 4 $\frac{1}{2}$	19 $\frac{3}{8}$	$\frac{3}{4}$	1
14	120	22200	53.9	2.7	15 $\frac{3}{4}$	28 $\frac{1}{4}$	$\frac{3}{4}$	3	$\frac{7}{8}$ x 4 $\frac{1}{2}$	22 $\frac{3}{8}$	1 $\frac{1}{8}$	1 $\frac{1}{4}$
16	115	27760	76.5	2.7	17 $\frac{7}{8}$	31 $\frac{3}{8}$	$\frac{3}{4}$	4	1 x 4 $\frac{1}{2}$	25 $\frac{3}{8}$	1 $\frac{1}{8}$	1 $\frac{1}{4}$
18	100	23900	94.3	4.3	20	35 $\frac{1}{8}$	$\frac{3}{4}$	4	1 $\frac{1}{4}$ x 5	28 $\frac{1}{8}$	1 $\frac{1}{8}$	1 $\frac{1}{4}$
20	75	27500	109.8	4.3	22 $\frac{1}{8}$	37 $\frac{3}{4}$	$\frac{3}{4}$	4 $\frac{1}{2}$	1 $\frac{1}{4}$ x 5	30 $\frac{1}{2}$	1 $\frac{1}{8}$	1 $\frac{3}{8}$
24	50	26200	148.6	5.8	26 $\frac{3}{8}$	44 $\frac{1}{4}$	$\frac{3}{4}$	5	1 $\frac{1}{2}$ x 5 $\frac{1}{2}$	36	1 $\frac{1}{4}$	1 $\frac{1}{2}$

\*Refers to Hydrostatic Test.

socket clamps

socket clamp

fig. 600

socket clamp washer

fig. 599

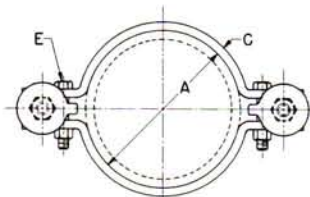
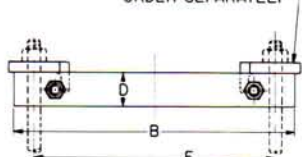


FIG. 599 WASHER  
ORDER SEPARATELY



**SIZE RANGE:** 4 through 24 inch pipe.

**MATERIAL:** Two carbon steel halfbands and two bolts and nuts.

**FINISH:** Black or galvanized; furnished black unless otherwise specified.

**SERVICE:** Clamps joints of socket fittings together to preclude distortion of pipe line under excessive water pressure.

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

**ORDERING:** Specify size, figure number, name.

socket clamp washer

Two cast iron washers, fig. 599, are used with each socket clamp and these must be ordered separately.

**ORDERING:** Specify washer size, figure number, name.

weights • dimensions (inches)

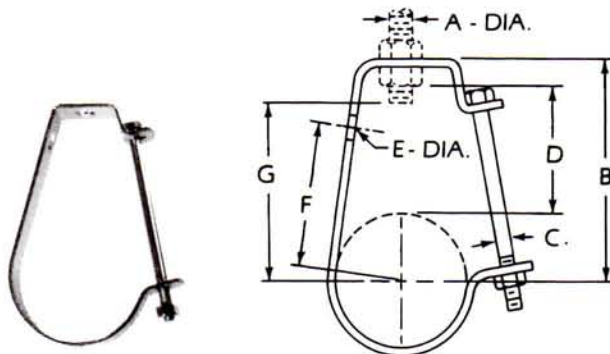
pipe size	wgt (approx) lbs each		A	B	C	D	bolt E	F	washer size
	clamp	washer							
3	9.7	1.2	4	11 <sup>5</sup> / <sub>8</sub>	1/2	2	5/8 x 3 1/2	9 3/4	3/4
4	11.0	1.2	5	12 1/8	1/2	2	5/8 x 3 1/2	9 3/4	3/4
6	12.7	1.2	7 1/16	14 3/8	1/2	2	5/8 x 3 1/2	12	3/4
8	14.5	1.2	9 3/16	16 3/8	1/2	2	5/8 x 3 1/2	14 1/4	3/4
10	16.3	1.2	11 3/8	18 7/8	1/2	2	5/8 x 3 1/2	16 1/2	3/4
12	18.3	1.2	13 1/2	21 1/4	1/2	2	5/8 x 3 1/2	18 7/8	3/4
14	48.7	2.7	15 3/4	25 1/2	3/4	3	7/8 x 4 1/2	22 3/8	1 1/4
16	69.2	2.7	17 7/8	28	3/4	4	1 x 4 1/2	24 3/4	1 1/4
18	82.0	4.5	20	31 1/2	3/4	4	1 1/4 x 5	27 3/8	1 1/4
20	97.5	4.5	22 1/8	33 3/4	3/4	4 1/2	1 1/4 x 5	29 3/4	1 3/8
24	132.0	6.8	26 3/8	39 3/4	3/4	5	1 1/2 x 5 1/2	35 1/4	1 1/2

conduit clamps

hanger pipe

or conduit

fig. 67



**MATERIAL:** Steel.

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

**COMPONENTS:** Strap and bolt with nut — assembled.

**FINISH:** Plated.

**ORDERING:** Specify pipe size, figure number, name.

pipe size	stock size	load rating	weight approx. ea. lb.
1/2	.120 x 3/4	400	.21
3/4	.120 x 3/4	400	.22
1	.120 x 3/4	400	.25
1 1/4	.120 x 3/4	400	.27
1 1/2	.120 x 3/4	400	.29
2	.120 x 3/4	400	.31
2 1/2	1/8 x 1 1/4	500	.71
3	1/8 x 1 1/4	500	.78
3 1/2	1/8 x 1 1/4	500	.84
4	3/16 x 1 1/4	550	1.39
5	3/16 x 1 1/4	550	1.66
6	1/4 x 1 1/4	600	2.26

pipe size	A	B	C	D	E	F	G
1/2	3/8	2 5/8	1/4	1 3/4	7/16	1 1/2	1 15/16
3/4	3/8	2 7/8	1/4	1 7/8	7/16	1 11/16	2 1/8
1	3/8	2 15/16	1/4	1 15/16	7/16	1 13/16	2 5/16
1 1/4	3/8	3 1/4	1/4	2	7/16	2 1/16	2 5/8
1 1/2	3/8	3 9/16	1/4	2 3/16	7/16	2 7/16	2 7/8
2	3/8	3 11/16	1/4	2 1/8	7/16	2 9/16	3 1/16
2 1/2	1/2	4 7/16	3/8	2 7/16	9/16	3 3/16	3 5/8
3	1/2	4 13/16	3/8	2 9/16	9/16	3 1/2	4 1/16
3 1/2	1/2	5 1/8	3/8	2 5/8	9/16	3 3/4	4 3/8
4	5/8	6 1/8	3/8	3 3/16	9/16	4 5/8	5 3/16
5	5/8	6 3/4	3/8	3 1/4	9/16	5 1/16	5 3/4
6	3/4	7 3/4	3/8	3 9/16	9/16	5 13/16	6 5/8

# Grinnell

## beam clamps

**\*UFS beam clamp with UFS (upper) nut right-hand thread: fig. 228**

**MATERIAL:** Forged steel.

**FINISH:** Black or galvanized.

**SERVICE:** For suspension of heavy loads from American Standard I-beams and wide flange beams with flange widths to 15 inches and flange thickness to 1.031.

**APPROVALS:** Complies with Federal Specification WW-H-171E (Type 30 without links; Type 31 with links) and Manufacturers Standardization Society SP-69 (Type 28 without links; Type 29 with links). Conforms to SP-58.

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

**FEATURES:**

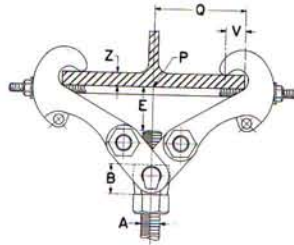
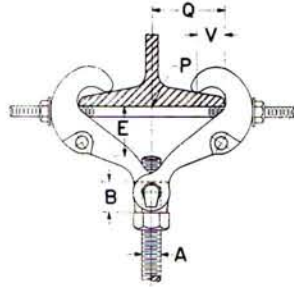
- Upper nut is tapped to any specified size up to the maximum rod size.
- Quickly, easily, economically installed.
- Tie rod insures a tight non-slip fit to the beam.

**ORDERING:** Specify clamp size, figure number, name, rod size

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

\*UFS - Universal Forged Steel

Size per load, beam flange width and rod size



**loads • weights • dimensions (inches)**

clamp size no.	maximum rod size A*	maximum recommended load, lb#	weight (approximate) lbs each	maximum beam flange thickness	B	V	jaw and eye nut size
1	5/8	1810	3.3	.60	1 1/16	For reference only.	228 — 1
2	7/8	3770	7.0	.60	1 3/8		228 — 2
3•	7/8	3770	10.6	.60	1 3/8		228 — 2
4	1 1/2	11500	19.3	1.031	2 3/8		228 — 3
5•	1 1/2	11500	31.0	1.031	2 3/8		228 — 3

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

**rod take-out (inches)**

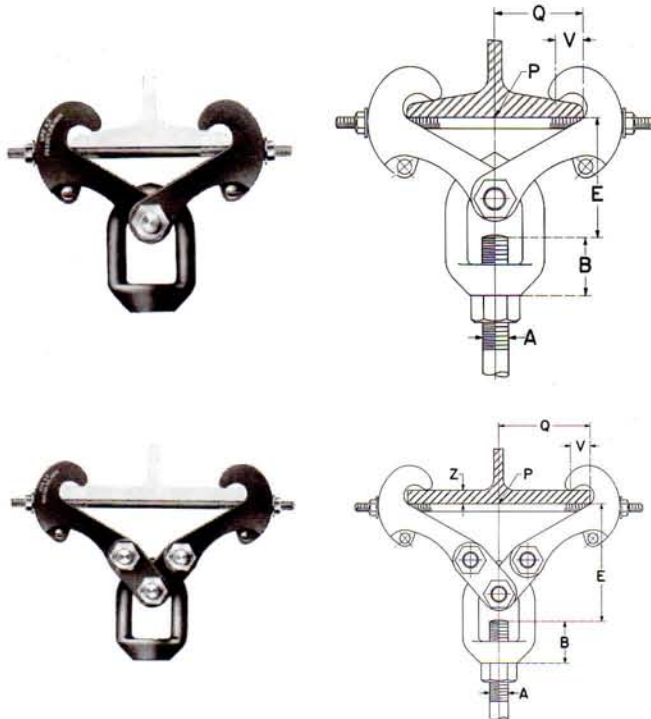
clamp size no.	rod take-out, E												
	for width of beam flange												
	3	4	5	6	7	8	9	10	11	12	13	14	15
1	1 9/16	1 1/2	1 5/16	1 1/8	3/4	....	....	....	....	....	....	....	....
2	....	1 7/16	1 5/16	1 1/8	1 1/16	....	....	....	....	....	....	....	....
3•	....	....	....	....	1 15/16	1 13/16	1 1/2	1 5/16	....	....	....	....	....
4	....	2 5/16	2 3/16	2 1/16	1 13/16	1 7/8	1 9/16	1 5/16	....	....	....	....	....
5•	....	....	....	....	....	....	....	3	2 1 1/16	2 9/16	2 1/4	1 15/16	1 5/8

\*Furnished with links.

\*Note: See page ph-163 for load capacity of rod.

## beam clamps

**\*UFS beam clamp  
with weldless eye nut  
right-hand thread: fig. 292  
left-hand thread: fig. 292L**



**MATERIAL:** Forged steel.

**FINISH:** Black or galvanized.

**SERVICE:** For suspension of heavy loads from American Standard I-beams and wide flange beams with flange widths to 15 inches and flange thickness to 1.031.

**APPROVALS:** Complies with Federal Specification WW-H-171E (Type 28 without links; Type 29 with links) and Manufacturers Standardization Society SP-69 (Type 28 without links; Type 29 with links).

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

**FEATURES:**

- Weldless eye nut provides for horizontal pipe movement without binding.
- Weldless eye nut is furnished tapped to any specified size up to the maximum rod size.
- Tie rod assures a tight non-slip fit to the beam.

**ORDERING:** Specify clamp size, figure number, name, rod size.

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

Size per load, beam flange width and rod size

\*UFS - Universal Forged Steel

**loads • weights • dimensions (inches)**

clamp size no.	maximum rod size A	maximum recommended load, lbs	weight (approximate) lbs each	maximum beam flange thickness	B	V	jaw and eye nut size
1	3/4	2710	3.9	.60	1/4		292 — 1/1
2	1	4960	9.2	.60	1 11/16	1 1/8	292 — 2/2
3•	1	4960	13.0	.60	1 11/16		292 — 2/2
4	1	4960	21.7	1.031	1 1/2		292 — 3/2
5•	1	4960	33.9	1.031	1 1/2	1 1/8	292 — 3/2
6	1 1/2	11500	23.9	1.031	2 1/8		292 — 3/3
7•	1 1/2	11500	35.8	1.031	2 1/8		292 — 3/3
8	2	11500	36.8	1.031	4 9/16	1 1/8	292 — 3/4

For reference only. Order by clamp size.

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

**rod take-out (inches)**

clamp size no.	rod take-out, E												
	3	4	5	6	7	for width of beam flange							15
						8	9	10	11	12	13	14	
1	4 1/2	4 5/16	4 1/16	3 3/8	2 7/8	.....	.....	.....	.....	.....	.....	.....	.....
2	.....	4 3/4	4 7/16	4 1/16	3 3/8	.....	.....	.....	.....	.....	.....	.....	.....
3•	.....	.....	.....	.....	5 15/16	6	5 5/16	5	.....	.....	.....	.....	.....
4	.....	6 13/16	6 3/8	6 3/8	5 7/8	5 7/8	5 3/8	4 13/16	.....	.....	.....	.....	.....
5•	.....	.....	.....	.....	.....	.....	.....	.....	8 1/8	7 3/4	7 1/8	6 5/8	6 1/16
6	.....	7 3/16	7	6 3/4	6 1/4	6 5/16	5 13/16	5 3/16	.....	.....	.....	.....	.....
7•	.....	.....	.....	.....	.....	.....	.....	.....	8 1/2	8 1/8	7 1/2	7	6 7/16
8	.....	8 3/8	8 7/16	8 3/16	7 3/4	7 3/4	7 1/4	6 5/8	.....	.....	.....	.....	.....

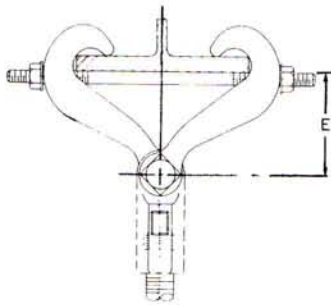
•Furnished with links.

\*Note: See page ph-163 for load capacity of rod.

# Grinnell

## beam clamps

### malleable beam clamp without extension piece: fig. 218



**MATERIAL:** Malleable iron jaw; steel tie rod, nuts and washer.

**FINISH:** Black or galvanized.

**SERVICE:** Recommended for attachment to structural steel. Use in conjunction with American Standard I-beams and wide flange beams where beam widths are from 2½ inches minimum to 7 inches maximum and flange thickness does not exceed .60 inch.

**APPROVALS:** Underwriters Laboratories listed and Factory Mutual approved for ¾ through 8 inch pipe when used with the Figure 157 extension piece. Complies with Federal Specification WW-H-171E (Type 30) and Manufacturers Standardization Society SP-69 (Type 30).

**INSTALLATION:** The malleable beam clamp fig. 218 may be used with an eye rod, or fig. 157 extension piece.

**FEATURES:**

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

**ORDERING:** Specify figure number, name.

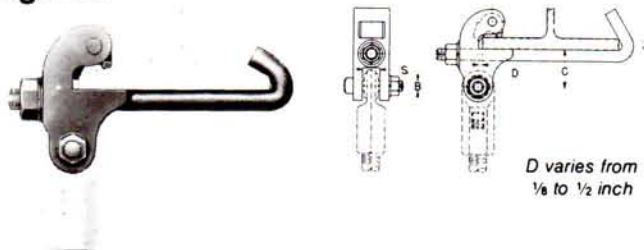
**NOTE:** When used with Fig. No. 157 page ph-65 extension piece, an additional inch or more of vertical adjustment is obtained.

loads • weights • dimensions (inches)

max rod size	maximum recommended load, lb <sub>m</sub>	weight (approx) lbs each	rod take-out, E or E'						bolt diameter
			for width of beam flange						
			2½	3	4	5	6	7	
<b>malleable beam clamp: fig. 218</b>									
7/8	1365	2.2	3½	3 <sup>7</sup> / <sub>16</sub>	3 <sup>5</sup> / <sub>16</sub>	2 <sup>15</sup> / <sub>16</sub>	2 <sup>9</sup> / <sub>16</sub>	1 <sup>7</sup> / <sub>8</sub>	7/16



## universal side I-beam clamp fig. 225



**MAXIMUM RECOMMENDED LOAD:** 1,140 lbs.; suitable for pipe sizes up to 8 inch.

**MATERIAL:** Malleable iron jaw with steel bolt and nut; steel hook rod with nut and spring washer.

**SERVICE:** For attachment to bottom flange of American Standard I-beams and wide flange beams where thickness of flange does not exceed .81 inches and where flexibility at the clamp is desirable.

**APPROVALS:** Underwriters' Laboratories listed and Factory Mutual approved for maximum pipe sizes indicated below when used with the figure 157 extension piece. Complies with Federal Specification WW-H-171E (Type 20) and Manufacturers Standardization Society SP-69 (Type 20).

### HOW TO SIZE:

- (1) Determine jaw size by reference to Z dimension of beam and pipe size (see table below).
- (2) Determine hook rod length by adding figure in column headed "X" to width of beam flange. (for flange width and Z dimension of beam, see table on page ph-166) X is not indicated as a dimension on the drawing.

**INSTALLATION:** For use with extension piece fig. 157, page ph-65.

**FINISH:** Black.

**ORDERING:** Specify jaw size, figure number, name, hook rod length. Standard hook rods are furnished in even inch lengths, either length ordered or next longer length.

### loads • weights

jaw size	max recom load, lb ■	wgt (approx) lbs each ▲	fig 157 rod size	max pipe size
1	390	1.1	3/8	2
2	390	1.1		
3	390	1.2		
4	770	2.2	1/2	3 1/2
5	770	2.2		
6	770	2.3	5/8	5
7	1140	3.0		
8	1140	3.2	3/4	6
9	1140	3.3		
			7/8	8

■ maximum temperature of 450°F.

▲ based on 8 inch hook rod length. Will vary for other hook rod lengths.

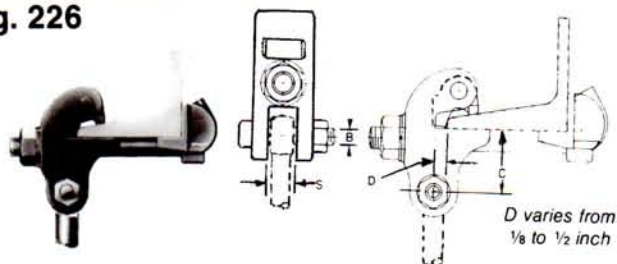
### dimensions (inches)

hook rod diam	jaw size			B	C	S	X
	Z < .41	Z > .40 < .63	Z > .62 < .82				
3/8	1	2	3	3/8	1 1/8	9/16	2 3/8
1/2	4	5	6	7/16	1 5/8	3/4	2 3/4
1/2	7	8	9	1/2	1 3/4	7/8	3

< = "less than"; > = "greater than."

## beam clamps

### universal channel clamp fig. 226



**MAXIMUM RECOMMENDED LOAD:** 1,140 lbs.; suitable for pipe sizes up to 8 inch.

**MATERIAL:** Same as fig. 225 Universal side I-beam clamp except with malleable heel plate added.

**SERVICE:** Recommended for attachment to bottom flange of an American Standard channel where thickness of flange does not exceed .61 inches and where flexibility at the clamp is desirable.

**APPROVALS:** Underwriters' Laboratories listed and Factory Mutual approved for maximum pipe sizes indicated below when used with the figure 157 extension piece. Complies with Federal Specification WW-H-171E (Type 20) and Manufacturers Standardization Society SP-69 (Type 20).

### HOW TO SIZE:

- (1) Determine jaw size by referring to "Z" dimension of American Standard channel (see table page ph-166) and pipe size (see table below).
- (2) Determine hook rod length by adding figure in column headed "X" to width of channel flange. X is not indicated as a dimension on drawing.

**INSTALLATION:** Clamp may be used with extension piece fig. 157, ph-65.

**FINISH:** Black.

**ORDERING:** Specify jaw size, figure number, name, hook rod length. Standard hook rods are furnished in even inch lengths, either length ordered or next longer length.

### loads • weights

jaw size	max recom load, lb	wgt (approx) lbs each ▲	fig 157 rod size	max pipe size
1	390	1.4	3/8	2
2	390	1.5		
3	390	1.9		
4	770	2.7	1/2	3 1/2
5	770	2.8		
6	770	2.9	5/8	5
7	1140	3.5		
8	1140	3.7	3/4	6
9	1140	3.9		
			7/8	8

▲ based on 8 inch hook rod length. Will vary for other hook rod lengths.

### dimensions (inches)

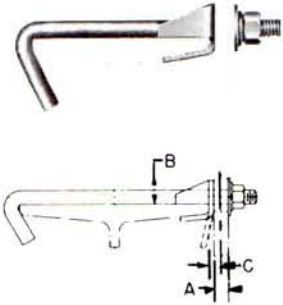
hook rod diam.	jaw size		B	C	S	X
	Z < .41	Z > .40 < .62				
3/8	1	2	3/8	1 1/8	9/16	2 3/8
1/2	4	5	7/16	1 5/8	3/4	2 3/4
1/2	7	8	1/2	1 3/4	7/8	3

< = "less than"; > = "greater than."

# Grinnell

## beam clamps

### top beam clamp fig. 227



**MATERIAL:** Steel jaw, hook rod with nut, spring washer and plain washer.

**SERVICE:** Recommended for use on top flange of American Standard I-beams, wide flange beams, and roof trusses where the flange thickness does not exceed .81 inches.

**APPROVALS:** Underwriters' Laboratories listed and Factory Mutual approved for maximum pipe sizes indicated below.

Up to 2 inch size pipe with 3/8 inch rod and up to 8 inch size pipe with 1/2 inch rod.

**HOW TO SIZE:** Determine hook rod length by adding figure in column headed X to flange width (see table on page ph-166 for flange width). X is not indicated as a dimension on drawing.

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

#### FEATURES:

- Two jaw sizes fit beam flanges from .25 inches to .81 inches.
- Clamp firmly holds to beam providing safe and extremely economical means of supporting small piping from the top flange of steel beams and roof trusses.

**FINISH:** Black.

**ORDERING:** Specify jaw size, figure number, name, hook rod length. Standard hook rods are furnished in even inch lengths, either length ordered or next longer length.

#### loads • weights • dimensions (inches)

jaw size	maximum recommended load, lb ■	weight (approx) lbs each▲	max pipe size	hook rod diameter	hanger rod A	B	C	X
1	610	.38	2	3/8	3/8	3/4	5/16	2 1/8
2	940	.67	3 1/2	1/2	1/2	1	3/8	2 1/4
	940		5	5/8	1 1/8	7/16	2 1/2	
	940		6	1/2	3/4	1 1/4	1/2	2 5/8
	940		8	1/2	3/4	1 1/4	1/2	2 5/8

▲Based on 8 inch hook rod length. Will vary for other hook rod lengths.  
■Maximum temperature of 650°F.

### beam clamp standard duty fig. 133



**MATERIAL:** Steel.

**FINISH:** Black or galvanized.

**FUNCTION:** Center I-beam clamp to center load on beam to prevent distortion.

**APPROVALS:** Listed by Underwriters' Laboratories, Inc. and approved by Factory Mutual for the maximum pipes listed below. Conforms to Federal Specification WW-H-171E (Type 21), and Manufacturers Standardization Society SP-69 (Type 21).

**COMPONENTS:** Two half-clamps, pipe spacer and both with nut - assembled.

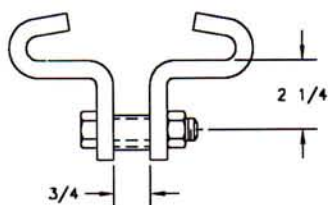
**FINISH:** Black.

**ORDERING:** Figure number, width of flange, name.

Nominal flange width	max flange thickness	weight (approx) lbs each
4	1/2	.91
5	5/8	1.00
6	3/4	1.15
7	7/8	1.29
8	7/8	1.44

fig	A	B	bolt size	stock size	maximum recommended load lbs
133	1/2	1 3/8	3/8	1/4 x 1 1/4	1000

**beam clamp  
heavy duty  
fig. 134**



**MATERIAL:** Steel.

**FINISH:** Black or galvanized.

**FUNCTION:** Center I-beam clamp to center load on beam to prevent distortion.

**APPROVALS:** Listed by Underwriters' Laboratories, Inc. and approved by Factory Mutual for the maximum pipe listed below. Conforms to Federal Specification WW-H-171E (Type 21), and Manufacturers Standardization Society SP-69 (Type 21).

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

**FINISH:** Black.

**ORDERING:** Figure number, width of flange, name.

flange width	max flange thickness	weight (approx) lbs each
4	1/2	3.82
5	5/8	4.35
6	3/4	4.52
7	7/8	4.84
8	7/8	5.10
9	1	5.83
10	1	6.25
11	1	6.67
12	1	7.09

bolt size	stock size	max recom load lbs
5/8	1/2 x 2	3000

# Grinnell

## beam clamps

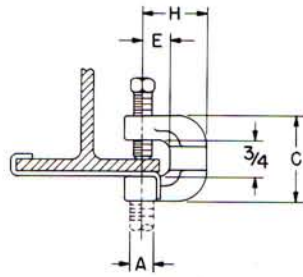
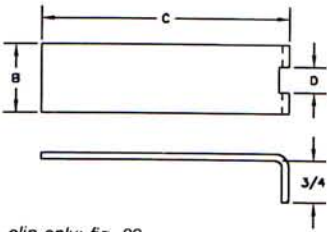
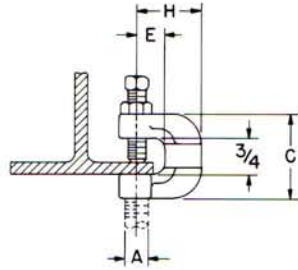
### C-clamp

clamp with locknut: fig. 86

clamp with retaining clip: fig. 87

clamp only: fig. 88 (w/set screw)

retaining clip only: fig. 89



clip only: fig. 89

clamp with retaining clip: fig. 87

**ROD SIZE RANGE:** 3/8 through 3/4 inch.

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

**FINISH:** Black or zinc plated.

**APPROVALS:** Underwriters' Laboratories listed and Factory Mutual approved for maximum pipe sizes listed below. Complies with Federal Specification WW-H-171E (Type 23), and Manufacturers Standardization Society SP-69 (Type 23).

**SERVICE:** Recommended for attachment to American Standard I-beams and wide flange beams where thickness of flange Z (see table page 173) does not exceed .75 inches. When clamp is used with retaining clip, flange thickness may not exceed .62 inches.

**INSTALLATION:** The fig. 88 is only to be used on installations where the clamp cannot become dislodged from the beam. Follow maximum recommended set screw torque values per MSS-SP-69.

#### FEATURES:

- Malleable body assures: (1) uniform quality and strength; (2) full thread engagement.
- Hardened steel cup point set screw for securing to beam flange.
- Ribbed design of clamp provides added strength.

**ORDERING:** Specify rod size, figure number, name; length of retaining clip, if desired. (Add 1/2 inch to flange width of beam to arrive at proper length of retaining clip.) If required length is not standard, order next longer standard.

### loads • weights • dimensions (inches)

rod size A	max pipe size inches	C	E	H	C-clamp		weight (approx) lbs. each	
					max recom load, lb■		fig.86	fig.88
					fig. 86	fig. 88		
3/8	2	1 3/4	5/8	1 3/8	400	400	.28	.26
1/2	3 1/2	1 3/4	5/8	1 3/8	400	400	.31	.29
5/8	5	2	3/4	1 1/2	440	440	.42	.40
3/4	6	2	3/4	1 1/2	500	500	.55	.53

■Maximum temperature of 450°F.

### retaining clip

rod size A	length			weights for lengths			
	C	B	D				
				4 1/2	8	10	14
3/8	4 1/2, 8, 10, 14	1	7/16	.17	.28	.35	.53
1/2	4 1/2, 8, 10, 14	1 1/4	1 1/2	.22	.37	.46	.63
5/8	4 1/2, 8, 10, 14	1 1/2	1 1/2	.25	.43	.51	.73
3/4	4 1/2, 8, 10, 14	1 3/4	1 1/2	.25	.43	.51	.73

**C-clamp  
with locknut  
fig. 95  
fig. 96 retaining clip**

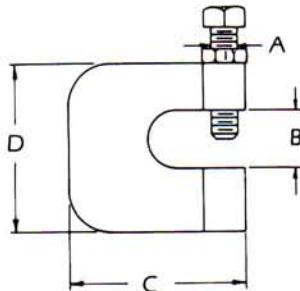


Fig. 95

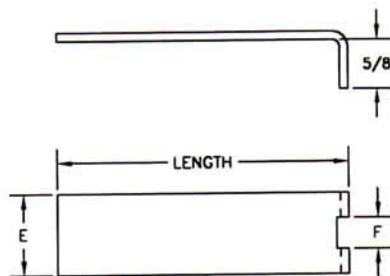


Fig. 96

**SIZE RANGE:** 3/8 to 1/2 inch rod.

**MATERIAL:** Carbon Steel.

**FINISH:** Fig. 95 black or electro-galvanized. Furnished black unless otherwise specified. Steel set screw and locknut. Fig. 96 black.

**SERVICE:** Designed for fastening to flange beam. Bottom hole tapped to accommodate hanger rod.

**APPROVALS:** The 3/8" rod size is listed by Underwriters' Laboratories Inc. and the 3/8" thru 1/2" rod sizes are approved by Factory Mutual. Comforms to Federal Specification WW-H-171E (Type 23) and Manufacturers Standardization Society SP-69, (Type 23).

**INSTALLATION:** Follow maximum recommended set screw torque values per MSS-SP-69.

**ORDERING:** Fig. 95, specify rod size, figure number, name. Fig. 96, figure number, length, name.

**NOTE:** When ordering Fig. 96, 1 inch should be added to beam flange width to determine length.

**fig. 96**

**FUNCTION:** To provide secure fastening of Fig. 95 C-clamp to beam flange.

**dimensions • loads • weights**

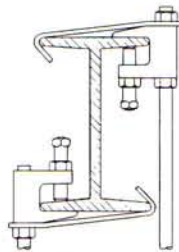
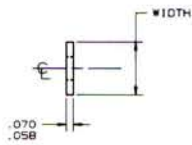
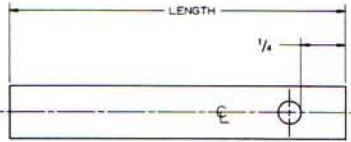
fig 95 rod size	max pipe size inches	max recom. load lbs	A	B	C	D	weight approx lbs each
3/8	2	230	3/8	3/4	2 1/4	2 3/8	.34
1/2	3 1/2	380	1/2	3/4	2 1/4	2 3/8	.40

fig 96 length	E	F	weight approx lbs each
4	1	3/16	.18
8	1	3/16	.29
10	1	3/16	.35
14	1	3/16	.46

# Grinnell

## beam clamps retaining clip fig. 89X

For use with fig. no.'s 92, 93 & 94 in seismic applications.



Typical Application

**MATERIAL:** Carbon Steel.

**FINISH:** Black or galvanized.

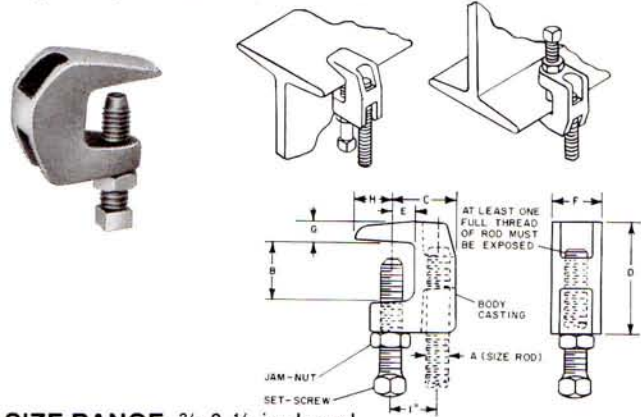
**HOW TO SIZE:** Specify length of retaining strap based on beam size.

**INSTALLATION:** Length of strap should be adequate to allow at least one inch of strap to be bent over the beam side of the flange opposite the side the beam clamp is mounted on.

**ORDERING:** Specify rod size, Fig. 89X, name, length of retaining clip. (Add 2 inches to flange width of beam to arrive at proper length of retaining clip). If required length is not standard, order next longer standard.

rod size	length L	width W	weight (for length)			
			6	8	10	14
3/8	6, 8, 10, 14	1	.10	.14	.17	.24
1/2			.13	.17	.22	.31
5/8		1 1/4	.13	.17	.22	.31
3/4			.13	.17	.22	.31

## universal C-type clamp fig. 92 (standard throat)



**SIZE RANGE:** 3/8 & 1/2 inch rod.

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

**APPROVALS:** Underwriters Laboratories/Underwriters Laboratories of Canada listed and Factory Mutual approved for NFPA 13 maximum rated pipe sizes. Complies with Federal Specification WW-H-171E and Manufacturers Standardization Society SP-69 (Type 19 & 23).

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

**HOW TO SIZE:** Size of clamp is determined by size of rod to be used.

**INSTALLATION:** Follow maximum recommended set screw torque values per MSS-SP-69.

### FEATURES:

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

**ORDERING:** Specify rod size, figure number, name of clamp.

**FINISH:** Black and plated.

### loads • weights

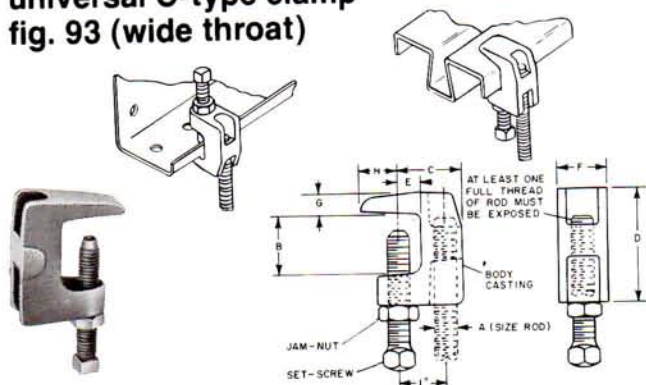
rod size A	max pipe size	maximum recommended load, lbs. ■		weight (approx.) lbs. each
		top	bottom	
3/8	4	500	250	.34
1/2	8	950	760	.63

■ Maximum temperature of 450°F

### dimensions (inches)

rod size A	B	C	D	E	F	G	H
3/8	3/4	1 5/16	1 9/16	9/16	13/16	3/8	1/2
1/2	3/4	1 3/8	1 13/16	1/2	1 1/16	7/16	23/32

## universal C-type clamp fig. 93 (wide throat)



**SIZE RANGE:**  $\frac{3}{8}$  &  $\frac{1}{2}$  inch rod.

**MATERIAL:**  $\frac{3}{8}$ " ductile iron  $\frac{1}{2}$ " malleable iron clamp, hardened steel cup point set screw and locknut.

**APPROVALS:** Underwriters Laboratories/Underwriters Laboratories of Canada listed and Factory Mutual approved for NFPA 13 maximum rated pipe sizes. Complies with Federal Specification WW-H-171E and Manufacturers Standardization Society SP-69 (Type 19 & 23).

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

**HOW TO SIZE:** Size of clamp is determined by size of rod to be used.

**INSTALLATION:** Follow recommended set screw torque values per MSS-SP-69.

### FEATURES:

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

**ORDERING:** Specify rod size, figure number, name of clamp.

**FINISH:** Black and plated.

### loads • weights

rod size A	max pipe size	maximum recommended load, lbs. ■		weight (approx.) lbs. each
		top	bottom	
$\frac{3}{8}$	4	500	250	.41
$\frac{1}{2}$	8	950	760	.75

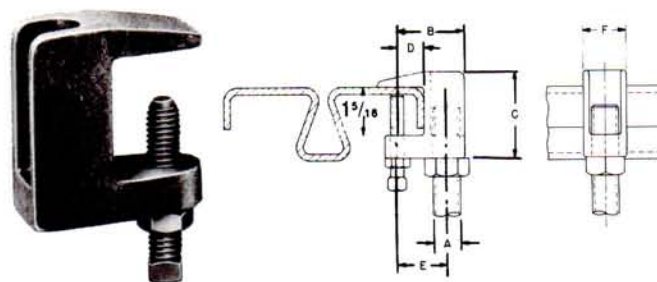
■ Maximum temperature of 450°F

### dimensions (inches)

rod size A	B	C	D	E	F	G	H
$\frac{3}{8}$	$1\frac{1}{4}$	$1\frac{5}{16}$	$2\frac{5}{32}$	$\frac{9}{16}$	$\frac{13}{16}$	$\frac{3}{8}$	$\frac{5}{8}$
$\frac{1}{2}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$2\frac{11}{32}$	$\frac{1}{2}$	$1\frac{1}{16}$	$\frac{7}{16}$	$\frac{13}{16}$

## beam clamps

### wide throat top beam C-clamp fig. 94



**SIZE RANGE:**  $\frac{5}{8}$  to  $\frac{3}{4}$  inch rod.

**MATERIAL:**  $\frac{5}{8}$ " Malleable iron clamp  $\frac{3}{4}$ " ductile iron, hardened steel cup point set screw and locknut.

**APPROVALS:** Underwriters Laboratories listed and Factory Mutual approved for maximum pipe sizes indicated below. Complies with Federal Specification WW-H-171E and Manufacturers Standardization Society SP-69 (Type 19).

**SERVICE:** Recommended for use under roof installations with bar joist type construction, or for attachment to the top flange of structural shapes where the vertical hanger rod is required to be offset from the edge of the flange and where the thickness of joists or flange does not exceed  $1\frac{5}{16}$  inches.

**HOW TO SIZE:** Size of clamp is determined by size of rod to be used.

**INSTALLATION:** Follow maximum recommended set screw torque values per MSS-SP-69.

### FEATURES:

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

**ORDERING:** Specify rod size, figure number, name of clamp.

**FINISH:** Black.

### loads • weights

rod size A	maximum pipe size	maximum recommended load, lbs. ■	weight (approximate) lbs each
$\frac{5}{8}$	10	1200	.66
$\frac{3}{4}$	12	1600	.83

■ Maximum temperature of 450°F.

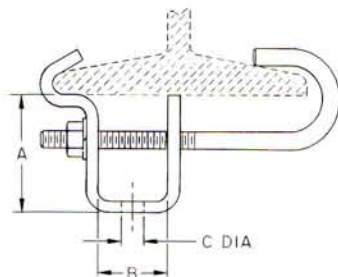
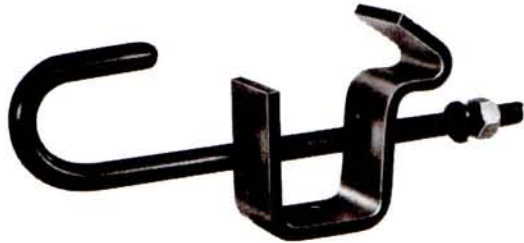
### dimensions (inches)

rod size A	B	C	D	E	F
$\frac{5}{8}$	$1\frac{3}{4}$	$2\frac{1}{4}$	$\frac{3}{4}$	$1\frac{1}{4}$	1
$\frac{3}{4}$	$1\frac{7}{8}$	$2\frac{3}{8}$	$\frac{3}{4}$	$1\frac{3}{8}$	$1\frac{3}{16}$

# Grinnell

## beam clamps

adjustable beam clamp  
fig. 14



**MATERIAL:** Carbon steel.

**SERVICE:** Recommended for supporting pipe from the bottom flange of beams.

**FINISH:** Black.

**APPROVALS:** Complies with Federal Spec WW-H-171E (Type 54) and Manufacturers Standardization Society SP-69 (Type 27).

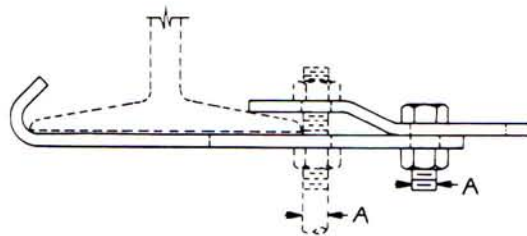
**ORDERING:** Specify rod size and figure number.

**loads • weights • dimensions (inches)**

size	max. recom. load lbs.	max pipe size	A	B	C
3/8	300	2	2 1/2	2	7/16
1/2	700	4	2 1/2	2	9/16
5/8	1000	8	2 1/2	2	1 1/16

steel size	adjustment		weight (approx.) lb. each
	minimum beam width	maximum beam width	
1/4 x 1 1/4	3 1/2	8	1.19
1/4 x 1 1/2	3 1/2	8	1.67
1/4 x 1 3/4	3 1/2	8	2.23

adjustable side beam clamp  
fig. 217



**MATERIAL:** Carbon steel.

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

**COMPONENTS:** Top slide, bottom hook, nut and bolt — assembled.

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

**FINISH:** Black.

**ORDERING:** Specify size, figure number, type, name.

**APPROVALS:** MSS SP-69 Type 25

**dimensions (inches) • loads • weights**

size	flange width	max. flange thickness	A dim.	stock size	max recom. load lbs.	weight (approx.) lb. each
<b>Fig. 217 - Type 1</b>						
3	3-4 1/2	1/2	3/8	3/16 x 1 1/4	300	.80
4 5/8	4 5/8-6	11/16	3/8	3/16 x 1 1/4	300	1.06
6 1/8	6 1/8-7 1/2	3/4	3/8	3/16 x 1 1/4	300	1.17
7 5/8	7 5/8-9	15/16	3/8	3/16 x 1 1/4	300	1.28
<b>Fig. 217 - Type 2</b>						
3	3-4 1/2	1/2	1/2	1/4 x 1 1/2	500	1.57
4 5/8	4 5/8-6	11/16	1/2	1/4 x 1 1/2	500	1.84
6 1/8	6 1/8-7 1/2	3/4	1/2	1/4 x 1 1/2	500	2.05
7 5/8	7 5/8-9	15/16	1/2	1/4 x 1 1/2	500	2.23
<b>Fig. 217 - Type 3</b>						
3	3-4 1/2	1/2	5/8	3/8 x 2	700	3.75
4 5/8	4 5/8-6	11/16	5/8	3/8 x 2	700	4.19
6 1/8	6 1/8-7 1/2	3/4	5/8	3/8 x 2	700	4.53
7 5/8	7 5/8-9	15/16	5/8	3/8 x 2	700	5.11



## structural attachments

**two hole welding beam lug**  
fig. 54



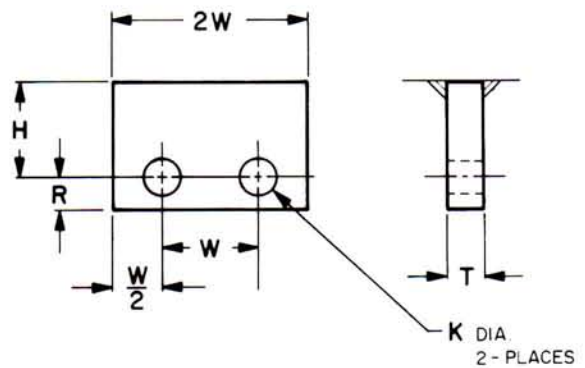
**SIZE RANGE:** For use with rod sizes 1/2 through 2 1/4 inch.

**MATERIAL:** Carbon Steel.

**FINISH:** Black.

**SERVICE:** For single rod suspension of Fig. 81-H, Type B & C Constant Supports.

**ORDERING:** Specify rod size, figure number, name and "H" dimension.



**loads • weight • dimensions (inches)**

rod size (inches)	max recom load lbs <sup>■</sup>	wgt (approx) lbs each ▲ "H" dim				rod take out H <sup>●</sup> constant support frame sizes					pin or bolt	K hole	R	T	W	2W	W/2
		1 1/2	2	3	4	1-9	10-18	19-34	35-49	50-63							
1/2	1130	1.4	1.7	2.2	...	1 1/2	1 1/2	2	3	...	5/8	1 1/16	1 1/4	3/8	2 1/2	5	1 1/4
5/8	1810	1.4	1.6	2.2	...	1 1/2	1 1/2	2	3	...	3/4	13/16	1 1/4	3/8	2 1/2	5	1 1/4
3/4	2710	1.3	1.6	2.1	2.6	...	1 1/2	2	3	4	7/8	15/16	1 1/4	3/8	2 1/2	5	1 1/4
1	4960	...	2.6	3.5	4.3	...	...	2	3	4	1 1/8	1 1/4	1 1/2	1/2	3	6	1 1/2
1 1/4	8000	...	5.0	6.5	7.9	...	...	2	3	4	1 3/8	1 1/2	2	5/8	4	8	2
1 1/2	11630	...	...	10.7	12.8	...	...	...	3	4	1 5/8	1 3/4	2 1/2	3/4	5	10	2 1/2
1 3/4	15700	...	...	10.4	12.5	...	...	...	3	4	1 7/8	2	2 1/2	3/4	5	10	2 1/2
2	20630	...	...	...	16.0	...	...	...	...	4	2 1/4	2 3/8	3	3/4	6	12	3
2 1/4	23000	...	...	...	15.6	...	...	...	...	4	2 1/2	2 5/8	3	3/4	6	12	3

● Select "H" Dimension Applicable to Constant Support Frame Size

▲ Weight varies with "H" dimension.

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

# Grinnell

## structural attachments

### structural welding lug

fig. 55



**SIZE RANGE:** Short lug is available for use with 1/2 through 3/4 inch rod; long lug may be used with 1/2 through 2 inch rod.

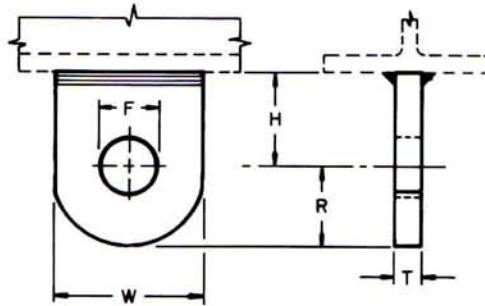
**MATERIAL:** Carbon Steel.

**FINISH:** Black.

**SERVICE:** For attachment to structural steel in conjunction with the Fig. 299 clevis and with type B and C spring hanger.

**APPROVALS:** Complies with Manufacturers Standardization Society SP-69 (Type 57).

**ORDERING:** Specify rod size, figure number, name and whether short or long lug is required.



### loads • weights • dimensions (inches)

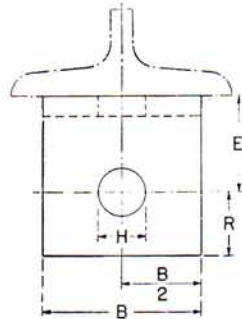
rod size (inches)	maximum recommended load, lb*		wgt (approx) lbs each		pin or bolt	F	rod take out H		R	T	W
	short	long	short	long			short	long			
1/2	1130	1130	.48	.75	5/8	11/16	1 1/2	3	1 1/4	1/4	2 1/2
5/8	1810	1810	.41	.68	3/4	13/16	1 1/2	3	1 1/4	1/4	2 1/2
3/4	2710	2710	.60	1.0	7/8	15/16	1 1/2	3	1 1/4	3/8	2 1/2
7/8	3770	3770	.71	.98	1	1 1/8	2	3	1 1/4	3/8	2 1/2
1	4960	4960	1.2	1.6	1 1/8	1 1/4	2	3	1 1/2	1/2	3
1 1/4	8000	8000	3.0	3.7	1 3/8	1 1/2	3	4	2	5/8	4
1 1/2	11630	11630	4.8	6.4	1 5/8	1 3/4	3	4 1/2	2 1/2	3/4	5
1 3/4	15700	15700	4.7	6.3	1 7/8	2	3	4 1/2	2 1/2	3/4	5
2	20700	20700	7.2	8.8	2 1/4	2 3/8	4	4 1/2	3	3/4	6
2 1/4	27200	...	7.6	...	2 1/2	2 5/8	4 1/2	...	3	3/4	6
2 1/2	33500	...	15.5	...	2 3/4	2 7/8	4 1/2	...	4	1	8
2 3/4	41580	...	15.1	...	3	3 1/8	4 1/2	...	4	1	8
3	50580	...	16.0	...	3 1/4	3 3/8	5	...	4	1	8
3 1/4	60480	...	18.9	...	3 1/2	3 5/8	5	...	4 1/2	1	9
3 1/2	71280	...	31.3	...	3 3/4	3 7/8	6	...	4 1/2	1 1/2*	9
3 3/4	82890	...	35.9	...	4	4 1/8	6	...	4 1/2	1 3/4*	9

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

**welded beam attachment**  
**fig. 66**

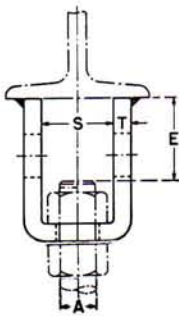


using bolt and eye rod



1 1/4-inch rod dia.  
and smaller

using hanger rod  
with attachment  
in inverted position



1-inch rod dia.  
and smaller only



2-inch rod dia.  
and larger

**MATERIAL:** Carbon steel.

**FINISH:** Black or galvanized.

**SERVICE:** Recommended for attachment to bottom of beams, especially where loads are considerable and rod sizes are large.

**HOW TO SIZE:** Size of attachments is determined by size of rod.

**APPROVALS:** Complies with Federal Specification WW-H-171E (Type 22) and Manufacturers Standardization Society SP-69 (Type 22).

**INSTALLATION:** If flexibility at the beam is desired, use with bolt and eye rod fig. 278, page ph-57, or with weld-less eye nut fig. 290, page ph-64. If vertical adjustment is desired, use with threaded rod and nut and weld the attachment in an inverted position to the beam.

**FEATURES:**

- Will accommodate very heavy loads and rod sizes through 3 1/2 inches.
- Can be installed so as to provide for either flexibility or for vertical adjustment.
- Versatility affords economical stocking and erection.
- Beam size need not be considered.

**ORDERING:** Specify rod size, figure number, name. Specify "with bolt and nut" if required for 1" rod size and smaller.

Specify "with pin and cotter pins" if required for 1 1/4 inch rod size and larger.

**loads • weights • dimensions (inches)**

rod size A	bolt size	maximum recommended load, lb*		wgt (approx) lbs each		rod take-out		B	H	R	S	T
		650°F	750°F	without bolt and nut	with bolt and nut	E	E'					
3/8	1/2 x 2 1/2	610	510	.96	1.2	1 7/8	2	2	9/16	7/8	1 1/4	1/4
1/2	5/8 x 2 1/2	1130	940	.96	1.3	1 3/4	2	2	1 1/16	7/8	1 1/4	1/4
5/8	3/4 x 2 3/4	1810	1510	.96	1.6	1 3/4	2	2	1 3/16	7/8	1 1/4	1/4
3/4	7/8 x 4	2710	2260	1.9	2.8	1 3/4	2	2 1/2	1 5/16	1 1/8	1 7/8	3/8
7/8	1 x 4	3770	3150	2.5	3.9	2 5/8	3	2 1/2	1 1/8	1 1/4	2	3/8
1	1 1/8 x 5 3/8	4960	4150	4.3	6.3	2 3/4	3	3	1 1/4	1 1/2	2 1/2	1/2
1 1/4	1 3/8 x 5 3/8	8000	6660	8.1	10.2	...	3	4	1 1/2	2	2 1/2	5/8
1 1/2	1 5/8 x 6	11630	9700	15.6	19.0	...	4	5	1 3/4	2 1/2	3	3/4
1 3/4	1 7/8 x 6 7/8	15700	14000	18.7	24.2	...	5	5	2	2 3/4	3 3/4	3/4
2	2 1/4 x 6 7/8	20700	18460	22.8	30.6	...	5	6	2 3/8	3 1/4	3 1/2	1/2
2 1/4	2 1/2 x 7 3/8	27200	24260	26.4	36.8	...	6	6	2 5/8	3 1/2	3 1/2	5/8
2 1/2	2 3/4 x 7 5/8	33500	29880	26.7	39.7	...	6	6	2 7/8	3 3/4	3 3/4	5/8
2 3/4	3 x 7	41580	37066	26.8	40.8	...	5 3/4	6	3 1/8	4	3 3/4	5/8
3	3 1/4 x 7	50580	45085	32.6	46.7	...	6 1/4	7	3 3/8	4	3 3/4	5/8
3 1/4	3 1/2 x 7 3/4	60480	53906	45.1	62.1	...	7	7	3 5/8	4 1/2	4 1/4	3/4
3 1/2	3 3/4 x 7 3/4	71280	63493	53.4	72.4	...	7 1/2	8	3 7/8	4 1/2	4 1/4	3/4

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

• 1 1/4" and larger are pins with cotter pins.

## structural attachments

### steel washer plate fig. 60



**SIZE RANGE:** For use with  $\frac{3}{8}$  to  $3\frac{3}{4}$  inch rod.

**MATERIAL:** Carbon steel.

**FINISH:** Black.

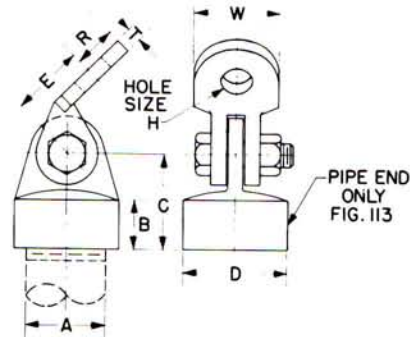
**SERVICE:** A heavy duty washer plate used on top of channels or angles for supporting pipe with rods or U-bolts.

**ORDERING:** Specify rod size, figure number, name.

#### weights • dimensions (inches)

rod size	wgt (approx) lbs each	size of stock	hole diameter
$\frac{3}{8}$	.62	3 x 3 x $\frac{1}{4}$	$\frac{1}{2}$
$\frac{1}{2}$	.62	3 x 3 x $\frac{1}{4}$	$\frac{5}{8}$
$\frac{5}{8}$	.91	3 x 3 x $\frac{3}{8}$	$\frac{3}{4}$
$\frac{3}{4}$	1.6	4 x 4 x $\frac{3}{8}$	$\frac{7}{8}$
$\frac{7}{8}$	2.2	4 x 4 x $\frac{1}{2}$	1
1	2.1	4 x 4 x $\frac{1}{2}$	$1\frac{1}{4}$
$1\frac{1}{4}$	3.3	5 x 5 x $\frac{1}{2}$	$1\frac{1}{2}$
$1\frac{1}{2}$	4.8	5 x 5 x $\frac{3}{4}$	$1\frac{3}{4}$
$1\frac{3}{4}$	4.7	5 x 5 x $\frac{3}{4}$	2
2	4.5	5 x 5 x $\frac{3}{4}$	$2\frac{1}{4}$
$2\frac{1}{4}$	6.6	6 x 6 x $\frac{3}{4}$	$2\frac{1}{2}$
$2\frac{1}{2}$	6.4	6 x 6 x $\frac{3}{4}$	$2\frac{3}{4}$
$2\frac{3}{4}$	6.2	6 x 6 x $\frac{3}{4}$	3
3	5.9	6 x 6 x $\frac{3}{4}$	$3\frac{1}{4}$
$3\frac{1}{4}$	5.6	6 x 6 x $\frac{3}{4}$	$3\frac{1}{2}$
$3\frac{1}{2}$	8.1	7 x 7 x $\frac{3}{4}$	$3\frac{3}{4}$
$3\frac{3}{4}$	7.8	7 x 7 x $\frac{3}{4}$	4

### brace fitting brace fitting complete: fig. 112 pipe end only: fig. 113



**MATERIAL:** Malleable iron bracket and pipe end; hex cap screw and nut.

**FINISH:** Black.

**SERVICE:** For bracing piping against sway and seismic disturbance.

**INSTALLATION:** Normally two fittings are used: a fig. 112 complete attached to one end of an IPS nipple and a fig. 113 pipe end only attached to the other end. The brace fitting complete connects to the building structure while the pipe end only connects to the pipe attachment. Use with fig. 212 FP pipe clamp.

#### FEATURES:

- Two piece pivoted assembly accommodates any angle to structure.
- Sight hole in pipe end provides easy means of checking thread engagement.

**ORDERING:** Specify size, figure number, name.

#### loads • weights

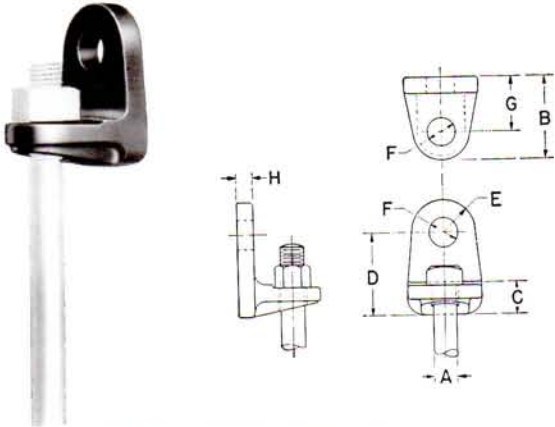
tapped pipe size A	max recom load, lb tension or compression		weight (approx) lbs each	
	msf of 5	msf of 3	fig. 112	fig. 113
1	600	950	.95	.50
$1\frac{1}{4}$	800	1350	1.4	.80

■ Minimum safety factor at maximum temperature of 450°F and maximum nipple length of 6 feet

#### dimensions (inches)

tapped pipe size A	B	C	D	E	hole dia H	R	T	W
1	1	$2\frac{3}{16}$	$1\frac{11}{16}$	$1\frac{1}{2}$	$\frac{9}{16}$	$\frac{3}{4}$	$\frac{1}{4}$	$1\frac{1}{2}$
$1\frac{1}{4}$	1	$2\frac{3}{16}$	$2\frac{3}{16}$	$1\frac{1}{2}$	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{5}{16}$	$1\frac{3}{4}$

iron side beam bracket  
fig. 202



**MAXIMUM RECOMMENDED LOAD:** 1,810 lbs. when used with bolts; suitable for pipe sizes up to 5 inch.

**MATERIAL:** Malleable iron.

**FINISH:** Black.

**SERVICE:** Recommended for use on sides of steel or wooden beams, etc.

**APPROVALS:** Underwriters Laboratories Inc., listed and Factory Mutual approved. Complies with Federal Specification WW-H-171E (Type 35) and Manufacturers Standardization Society SP-69 (Type 34).

**HOW TO SIZE:** Determine size by pipe size.

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

**ORDERING:** Specify rod size, figure number, name.

loads • weights

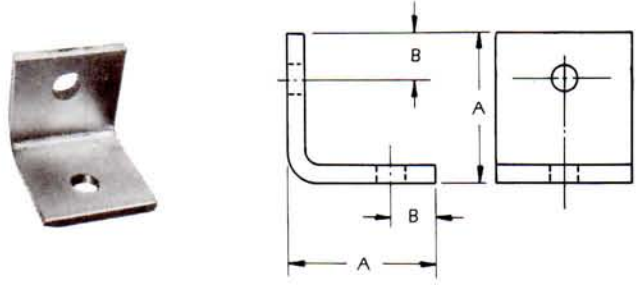
rod size A	max pipe size	max. recommended load, lb		wgt (approx) lbs each
		with lag screw	with bolt to steel	
3/8	3/4-2	390	610	.26
1/2	2 1/2-3 1/2	640	1130	.54
5/8	4-5	760	1810	.94

■ Maximum temperature of 450°F.

dimensions (inches)

rod size A	B	C	D	E	F	G	H
3/8	1 3/8	5/8	17/16	17/32	7/16	7/8	1/4
1/2	1 13/16	3/4	1 7/8	2 1/32	9/16	1 3/16	1 1/32
5/8	2 3/16	7/8	2 1/8	7/8	3/4	1 7/16	7/16

steel side beam bracket  
fig. 206



**MAXIMUM RECOMMENDED LOAD:** 2,000 lbs when used with bolts suitable for pipe sizes up to 8 inch.

**MATERIAL:** Carbon steel.

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

**APPROVALS:** Listed by Underwriters Laboratories Inc., listed and Factory Mutual approved and complies with Federal Specification WW-H-171E (Type 35) and Manufacturers Standardization Society SP-69 (Type 34).

**FINISH:** Black.

**ORDERING:** Specify rod size, figure number, name.

loads • weights

rod size	maximum recommended load, lbs.		weight (approx.) lb. each
	with lag screw	with bolt to steel	
3/8	650	1150	.44
1/2	650	1150	.43
5/8	850	2000	.84

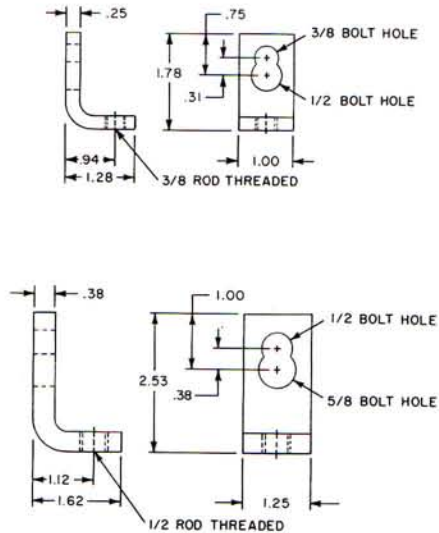
dimensions (inches)

rod size	max pipe size	A	B	hole size	stock size
3/8	2	2 1/16	5/8	7/16	1/4 x 2
1/2	6	2 1/16	5/8	9/16	1/4 x 2
5/8	8	2 1/2	3/4	1 1/16	3/8 x 2

# Grinnell

## steel brackets

### side beam bracket fig. 207



**MATERIAL:** Carbon Steel.

**FINISH:** Black.

**SERVICE:** Recommended for use on sides of steel or wooden beams, etc.

**APPROVALS:** Underwriter's Laboratories listed and Factory Mutual approved for the maximum pipe sizes indicated below. Complies with Federal Specification WW-H-171E (Type 35) and Manufacturers Standardization Society SP-69 (Type 34).

**HOW TO SIZE:** Determine bolt size by pipe size or loading as applicable.

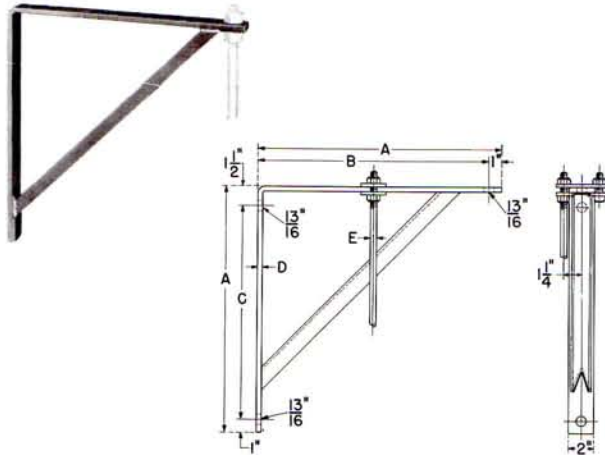
**FEATURES:** Threaded mounting bracket provides an economical, practical and adjustable means of securing hangers to beams.

**ORDERING:** Specify rod size, figure number, name.

#### loads • weights

rod size	bolt size	max. pipe size	max. recom. load, lb.		weight (approx) lbs. each
			with lag screw	with bolt to steel	
3/8	3/8	2	400	620	.17
	1/2	4	560	620	.17
1/2	1/2	6	650	1150	.42
	5/8	8	850	1150	.42

### light welded steel bracket bracket: fig. 194



**MAXIMUM RECOMMENDED LOAD:** 750 lbs.

**MATERIAL:** Carbon steel.

**FINISH:** Black or galvanized.

**SERVICE:** Recommended for support from below.

**APPROVALS:** Factory Mutual approved for the support of up to 2" pipe with 3/8" rod, up to 3 1/2" pipe with 1/2" rod, up to 5" pipe with 5/8" rod and up to 6" pipe with 3/4" rod, on the Fig. 194 Bracket. Complies with Federal Specification WW-H-171E (Type 32) and Manufacturers Standardization Society SP-69 (Type 31).

**HOW TO SIZE:** Determine bracket size by dimension of standard bracket most suitable to the installation.

**INSTALLATION:** Attached by bolting to wall. A backing plate may be required.

#### FEATURES:

- Bracket may be installed either in position illustrated or reversed.
- Ends of bracket are drilled to take hanger rods up to 3/4 inch.

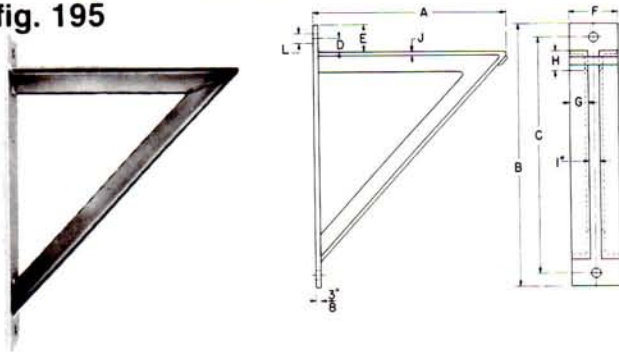
**ORDERING:** Specify bracket number, figure number, name. Order hanger rods and hex nuts separately.

#### weights • dimensions (inches)

bracket no.	wgt (approx) lbs each	A	B	C	D
1	3.1	9	8	6 1/2	5/16
2	7.7	13	12	10 1/2	5/16
3	12.8	19	18	16 1/2	3/8

## steel brackets

**medium welded steel bracket**  
fig. 195



**MAXIMUM RECOMMENDED LOAD:** 1,500 lbs.

**MATERIAL:** Carbon steel.

**FINISH:** Black or galvanized.

**SERVICE:** Recommended for the support of loads up to 1,500 lbs.

**APPROVALS:** Complies with Federal Specification WW-H-171E (Type 33) and Manufacturers Standardization Society SP-69 (Type 32).

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

**INSTALLATION:** When bolted to a wall, an additional back plate is normally used of such thickness and size as to properly distribute the weight over the wall.\*

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

**ORDERING:** Specify bracket number, figure number, name. Order separately: bolts, nuts and back plates for fastening brackets to wall. Specify size and length of bolts; size, thickness, and drilling of plates. Orders for special brackets are to be accompanied by detailed sketch.

**weights • dimensions (inches)**

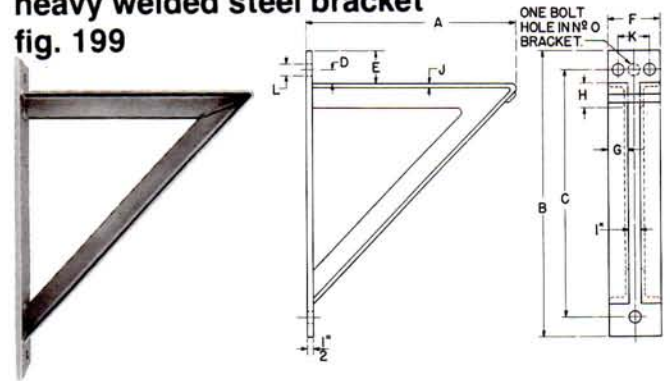
bracket no.	wgt (approx) lbs each	A	B	C	D
0	17.4	12	18	15 1/4	1 1/4
1	27.3	18	24	21 1/2	1 1/4
2	47.7	24	30	27 1/2	1 1/4

bracket no.	E	F	G	H	J	L
0	2 1/2	4	1 1/2	1 1/2	1/4	13/16
1	2 1/2	5	1 3/4	1 3/4	3/16	13/16
2	2 1/2	5	2	2	1/4	13/16

\*Size and thickness of back plate is governed by the load to be carried and the nature and condition of wall.

**heavy welded steel bracket**  
fig. 199



**MAXIMUM RECOMMENDED LOAD:** 3,000 lbs.

**MATERIAL:** Carbon steel.

**FINISH:** Black or galvanized.

**SERVICE:** Recommended for the support of loads up to 3,000 lbs.

**APPROVALS:** Complies with Federal Specification WW-H-171E (Type 34) and Manufacturers Standardization Society SP-69 (Type 33).

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

**INSTALLATION:** When bolted to a wall, an additional back plate is normally used of such thickness and size as to properly distribute the weight over the wall.\*

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

**ORDERING:** Specify bracket number, figure number, name. Order separately: bolts, nuts and back plates for fastening brackets to wall. Specify size and length of bolts; size, thickness, and drilling of plates. Orders for special brackets are to be accompanied by detailed sketch.

**weights • dimensions (inches)**

bracket no.	wgt (approx) lbs each	A	B	C	D	E
0	24.3	12	18	15 1/4	1 3/8	2 3/4
1	51.8	18	24	21 3/8	1 7/16	2 3/4
2	65.8	24	30	27 1/2	1 1/2	2 3/4

bracket no.	F	G	H	J	K	L
0	4	1 1/2	2	1/4	...	13/16
1	5	2	2	3/8	2 3/4	15/16
2	5	2	2 1/2	5/16	2 1/2	1 1/16
3	5	2	2 1/2	5/16	2 1/2	1 1/16
4	6	2 1/2	3 1/2	3/8	3 1/2	1 1/16
5	6	2 1/2	3 1/2	3/8	3 1/2	1 1/16

# Grinnell

## concrete attachments

### concrete single lug plate fig. 47



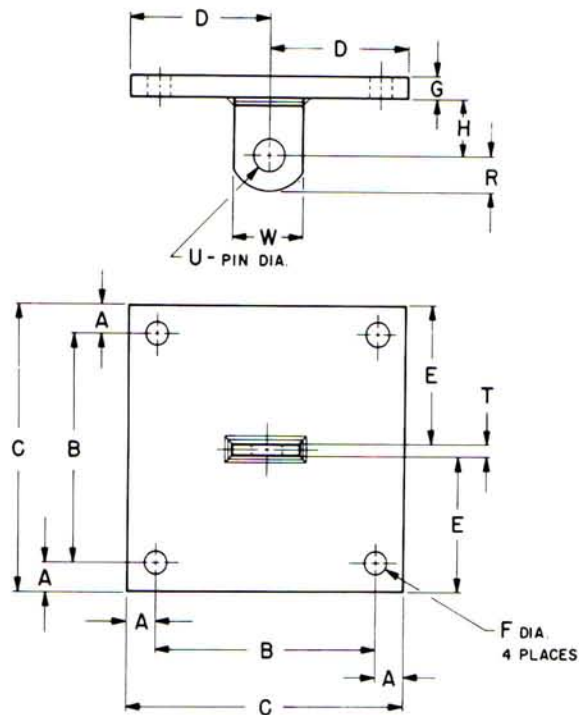
**SIZE RANGE:** For use with rod sizes 1/2 through 2 inch.

**MATERIAL:** Carbon steel.

**FINISH:** Black or galvanized.

**SERVICE:** Structural attachment to concrete ceiling Lug is used in conjunction with Fig. 299 forged steel clevis.

**ORDERING:** Specify rod size, figure number and name.



### loads • weights • dimensions (inches)

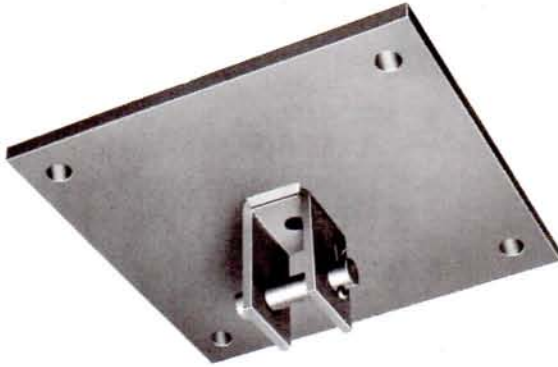
rod size (Inches)	maximum recommended load lb <sup>a</sup>	wgt (approx) lbs each	A	B	C	D	E	F	G	H	R	T	U	W
1/2	1130	11.1	1	8	10	5	47/8	9/16	3/8	1 1/2	1 1/4	1/4	5/8	2 1/2
5/8	1810	14.6	1	8	10	5	47/8	9/16	1/2	1 1/2	1 1/4	1/4	3/4	2 1/2
3/4	2710	14.8	1	8	10	5	4 13/16	11/16	1/2	1 1/2	1 1/4	3/8	7/8	2 1/2
7/8	3770	22.0	1	8	10	5	4 13/16	11/16	3/4	2	1 1/4	3/8	1	2 1/2
1	4960	31.9	2	8	12	6	5 3/4	13/16	3/4	2	1 1/2	1/2	1 1/8	3
1 1/4	8000	43.8	2	8	12	6	5 11/16	15/16	1	3	2	5/8	1 3/8	4
1 1/2	11630	45.6	2	8	12	6	5 5/8	1 1/8	1	3	2 1/2	3/4	1 5/8	5
1 3/4	15700	55.7	2	8	12	6	5 5/8	1 3/8	1 1/4	3	2 1/2	3/4	1 7/8	5
2	20700	58.2	2	8	12	6	5 5/8	1 3/8	1 1/4	4	3	3/4	2 1/4	6

<sup>a</sup> Based on the allowable stresses shown in the ASME Code for Pressure Piping.



## concrete attachments

**concrete clevis plate**  
**fig. 49**



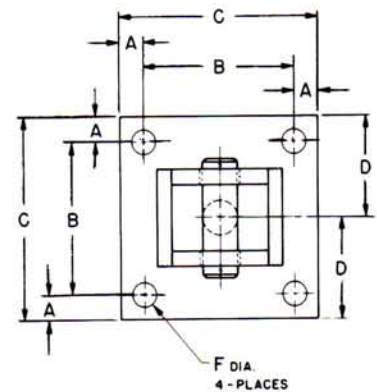
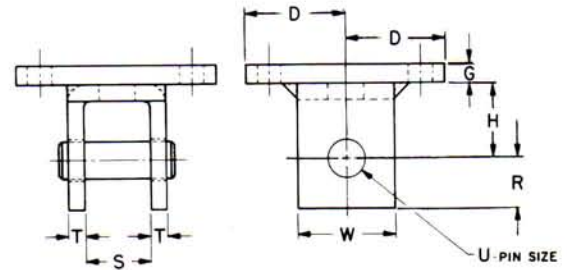
**SIZE RANGE:** For use with  $\frac{3}{8}$  through 2" rod.

**MATERIAL:** Carbon steel.

**FINISH:** Black or galvanized.

**SERVICE:** Structural attachment to concrete ceiling where flexibility is desired. Concrete clevis plate is normally used in conjunction with Fig. 290 weldless eye nut or Fig. 278 welded eye rod.

**ORDERING:** Specify rod size, figure number and name.



**loads • weights • dimensions (inches)**

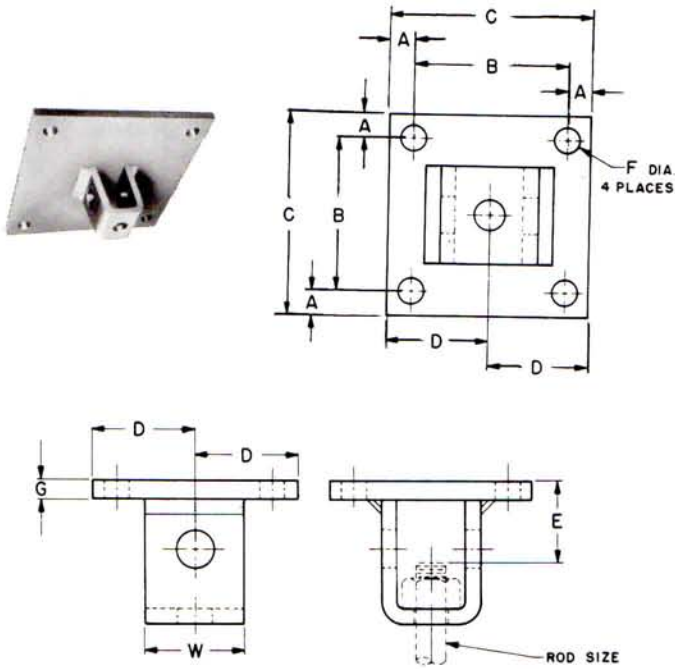
rod size (inches)	maximum recommended load, lb <sub>w</sub>	wgt (approx) lbs each	A	B	C	D	F	G	H	R	S	T	U	W
$\frac{3}{8}$	610	11.8	1	8	10	5	$\frac{5}{16}$	$\frac{3}{8}$	2	$\frac{7}{8}$	1 $\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{2}$	2
$\frac{1}{2}$	1130	11.9	1	8	10	5	$\frac{5}{16}$	$\frac{3}{8}$	2	$\frac{7}{8}$	1 $\frac{1}{4}$	$\frac{1}{4}$	$\frac{5}{8}$	2
$\frac{5}{8}$	1810	15.7	1	8	10	5	$\frac{5}{16}$	$\frac{1}{2}$	2	$\frac{7}{8}$	1 $\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{4}$	2
$\frac{3}{4}$	2710	16.9	1	8	10	5	$\frac{11}{16}$	$\frac{1}{2}$	2	1 $\frac{1}{2}$	1 $\frac{7}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	2 $\frac{1}{2}$
$\frac{7}{8}$	3770	18.1	1	8	10	5	$\frac{11}{16}$	$\frac{1}{2}$	3	1 $\frac{1}{2}$	2	$\frac{3}{4}$	1	2 $\frac{1}{2}$
1	4960	36.9	2	8	12	6	$\frac{13}{16}$	$\frac{3}{4}$	3	1 $\frac{1}{2}$	2 $\frac{1}{2}$	$\frac{1}{2}$	1 $\frac{1}{8}$	3
1 $\frac{1}{4}$	8000	40.9	2	8	12	6	$\frac{15}{16}$	$\frac{3}{4}$	3	2	2 $\frac{1}{2}$	$\frac{3}{4}$	1 $\frac{1}{8}$	4
1 $\frac{1}{2}$	11630	59.8	2	8	12	6	1 $\frac{1}{8}$	1	4	2 $\frac{1}{2}$	3	$\frac{3}{4}$	1 $\frac{1}{8}$	5
1 $\frac{3}{4}$	15700	93.6	2	10	14	7	1 $\frac{1}{8}$	1 $\frac{1}{4}$	5	2 $\frac{3}{4}$	3 $\frac{1}{2}$	$\frac{1}{2}$	1 $\frac{1}{8}$	5
2	20700	100.0	2	10	14	7	1 $\frac{1}{8}$	1 $\frac{1}{4}$	5	3 $\frac{1}{4}$	3 $\frac{1}{2}$	$\frac{1}{2}$	2 $\frac{1}{4}$	6

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

# Grinnell

## concrete attachments

### concrete rod attachment plate fig. 52



**SIZE RANGE:** for use with rod sizes  $\frac{3}{8}$  through 1 inch.

**MATERIAL:** Carbon steel.

**FINISH:** Black.

**SERVICE:** Structural attachment to concrete ceiling where vertical adjustment is desired. Normally used with threaded rod and nut.

**ORDERING:** Specify rod size, figure number and name.

#### loads • weights

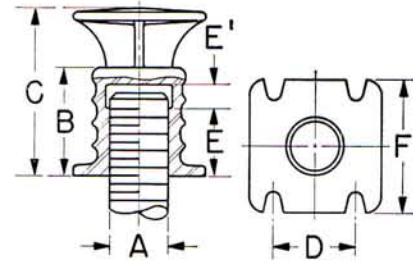
rod size (inches)	maximum recommended load, lbs	wgt (approx) lbs each
$\frac{3}{8}$	610	11.6
$\frac{1}{2}$	1130	11.6
$\frac{5}{8}$	1810	15.1
$\frac{3}{4}$	2710	16.1
$\frac{7}{8}$	3770	16.7
1	4960	34.9

#### dimensions (inches)

sizes	A	B	C	D	E	F	G	W
$\frac{3}{8}$	1	8	10	5	$2\frac{1}{4}$	$\frac{9}{16}$	$\frac{3}{8}$	2
$\frac{1}{2}$	1	8	10	5	$2\frac{1}{8}$	$\frac{9}{16}$	$\frac{3}{8}$	2
$\frac{5}{8}$	1	8	10	5	$2\frac{1}{4}$	$\frac{9}{16}$	$\frac{1}{2}$	2
$\frac{3}{4}$	1	8	10	5	$2\frac{1}{4}$	$\frac{11}{16}$	$\frac{1}{2}$	$2\frac{1}{2}$
$\frac{7}{8}$	1	8	10	5	$3\frac{1}{8}$	$\frac{11}{16}$	$\frac{1}{2}$	$2\frac{1}{2}$
1	2	8	12	6	$3\frac{1}{2}$	$\frac{13}{16}$	$\frac{1}{2}$	3

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

### screw concrete insert fig. 152



**SIZE RANGE:** For use with up to 12 inch pipe.

**MATERIAL:** Malleable iron.

**FINISH:** Black.

**SERVICE:** Upper attachment for suspending pipe from a concrete ceiling where no lateral adjustment is required.

**APPROVALS:** Underwriters Laboratories listed and Factory Mutual approved for maximum pipe sizes indicated below.

#### FEATURES:

- Eliminates the necessity of drilling holes in wooden forms.
- Reduced overall-height and four slots for nail attachment gives stability to the insert while the concrete is being poured.

**ORDERING:** Specify rod size, figure number, name.

#### loads • weights

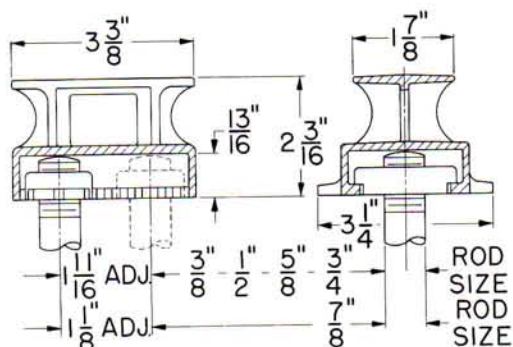
rod size A	max pipe size	maximum recom load, lbs	weight (approx) lbs each
$\frac{3}{8}$	2	610	.31
$\frac{1}{2}$	$3\frac{1}{2}$	1130	.32
$\frac{5}{8}$	5	1260	.37
$\frac{3}{4}$	6	2500	.64
$\frac{7}{8}$	12	2500	.71

#### dimensions (inches)

rod size A	B	C	D	E	E'	F
$\frac{3}{8}$	$\frac{11}{32}$	$2\frac{1}{4}$	1	$\frac{1}{2}$	$\frac{3}{8}$	$1\frac{5}{8}$
$\frac{1}{2}$	$\frac{11}{32}$	$2\frac{1}{4}$	1	$\frac{1}{2}$	$\frac{3}{8}$	$1\frac{5}{8}$
$\frac{5}{8}$	$\frac{17}{32}$	$2\frac{1}{4}$	1	$\frac{5}{8}$	$\frac{3}{8}$	$1\frac{5}{8}$
$\frac{3}{4}$	$1\frac{1}{8}$	$2\frac{1}{2}$	$1\frac{1}{4}$	$\frac{15}{16}$	$\frac{7}{16}$	2
$\frac{7}{8}$	$1\frac{1}{8}$	$2\frac{1}{2}$	$1\frac{1}{4}$	1	$\frac{3}{8}$	2

■ Based on insert only. Rating is subject to the condition that the concrete used is of sufficient strength to hold the insert.

**CB — universal concrete insert**  
fig. 282



### loads • weights

	nut size	maximum recommended load, lb■	weight (approx) lbs each
insert complete with nut	3/8	610	1.5
	1/2	1130	1.5
	5/8	1140	1.5
	3/4	1140	1.5
	7/8	1140	1.5
insert only	...	...	1.3
nut only	3/8	...	.20
	1/2	...	.21
	5/8	...	.20
	3/4	...	.22
	7/8	...	.21

■ Based on insert and nut only. Rating is subject to the condition that the concrete used is of sufficient strength to hold the insert.

**MATERIAL:** Malleable iron body and nut.

**FINISH:** Black or galvanized.

**SERVICE:** Upper attachment for suspending pipe, shafting, motors and similar equipment from a concrete ceiling; especially suitable where rod sizes cannot be readily determined in advance.

**APPROVALS:** The 3/8 inch rod size is Underwriters Laboratories listed and Factory Mutual approved for use with up to 4 inch size pipe while the 1/2 through 7/8 inch rod sizes are listed/approved for use with up to 8 inch size pipe. Complies with Federal Specification WW-H-171E (Type 18) and Manufacturers Standardization Society SP-69 (Type 18).

### INSTALLATION:

- (1) Nail insert to wooden forms.
- (2) Where convenient, reinforcing rods may be placed in the opening through the top of the insert, or short lengths of reinforcing rod may be wired to the insert prior to pouring concrete. However, the specified load ratings and approvals are not dependent on the use of any reinforcing rods in contact with the insert.
- (3) After concrete is poured and wooden forms are removed, place nut in insert and screw rod through nut until rod is firmly against the top of the insert body. The rod should not be forced against the top of the recess thereby placing unnecessary stress at the opening of the insert by the nut.

### FEATURES:

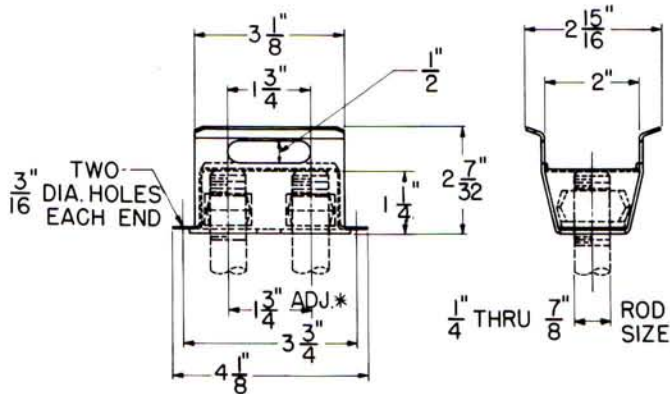
- Cast body prevents concrete seepage.
- Opening in top of insert provides for use of reinforcing rods up to 7/8 inch in diameter. Sides of insert are recessed for reinforcing rods up to 1 inch in diameter.
- Low height, broad flat bottom and widely separated nail slots minimize displacement during construction.
- The nut, held in place by V-type teeth on both insert and nut, can be raised and moved from side to side providing for lateral adjustment.
- Rod is locked in place by screwing it firmly against the top of the recess.
- One body size.

**ORDERING:** Specify figure number, name, size of nut tapping if nut is required.

# Grinnell

## concrete inserts

wedge type concrete insert  
fig. 281



**MATERIAL:** Carbon steel body; malleable iron nut.

**FINISH:** Black or galvanized.

**SERVICE:** Upper attachment for suspending pipe or conduit from concrete ceiling.

**APPROVALS:** The  $\frac{3}{8}$  inch rod size is Underwriters Laboratories listed and Factory Mutual approved for use with up to 4 inch size pipe while the  $\frac{1}{2}$  through  $\frac{3}{4}$  inch rod sizes are listed/approved for use with up to 8 inch size pipe. Complies with Federal Specification WW-H-171E (Type 19) and Manufacturers Standardization Society SP-69 (Type 18).

**INSTALLATION:**

- (1) Nail insert to wooden forms.
- (2) Where convenient, reinforcing rods may be placed in the opening through the top of the insert, or short lengths of reinforcing rod may be wired to the insert prior to pouring concrete. However, note that the specified load ratings and approvals are not dependent on the use of any reinforcing rods in contact with the insert.
- (3) After concrete is poured and wooden forms are removed, insert screw driver into slot in knockout plate and snap it out.
- (4) The nut may be put on the rod before inserting in the insert body. Then, turn rod so that elongated nut lies across the slot; screw rod through nut until rod is firmly against the top of the recess.

**FEATURES:**

- Nut may be put on hanger rod before insertion, avoiding need of locating nut in insert body prior to inserting rod.
- Insert nut, when located in position, wedges against the sloping sides of insert, providing greater support than if resting on lower edge of the insert body.
- Wedge-shaped body is so held by concrete in compression thus increasing load carrying capacity.
- Easily removed knockout plate.
- Rod can be adjusted along complete length of slot.
- One body for six sizes of rod.

**ORDERING:** Specify figure number, name, size of nut tapping if nut is required.

**loads • weights**

	nut size	maximum recommended load, lb■	weight (approx) lbs each
insert complete with nut	$\frac{1}{4}$	240	.82
	$\frac{3}{8}$	610	.82
	$\frac{1}{2}$	1130	.86
	$\frac{5}{8}$	1200	.89
	$\frac{3}{4}$	1200	.86
	$\frac{7}{8}$	1200	.93
insert only	...	...	.69
nut only	$\frac{1}{4}$	...	.13
	$\frac{3}{8}$	...	.13
	$\frac{1}{2}$	...	.17
	$\frac{5}{8}$	...	.20
	$\frac{3}{4}$	...	.17
	$\frac{7}{8}$	...	.24

■ Based on insert and nut only. Rating is subject to the condition that the concrete used is of sufficient strength to hold the insert.

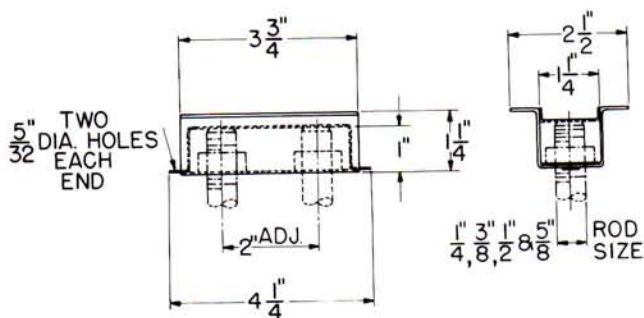
light weight concrete insert  
fig. 285



knockout seals out concrete during pouring



nut and rod in place



**MATERIAL:** Carbon steel.

**FINISH:** Black.

**SERVICE:** Upper attachment for suspending pipe or conduit from concrete ceiling.

**INSTALLATION:**

- (1) Nail insert to wooden forms.
- (2) Reinforcing rods may be located under the arched flanges at the top of the insert. However, note that the specified load ratings and approvals are not dependent on the use of any reinforcing rods in contact with the insert.
- (3) After concrete is poured and wooden forms are removed, remove knockout by tapping along edge with pointed instrument.
- (4) Slip nut into insert and screw rod through nut until rod is firmly against the top of insert body.

**APPROVALS:** The 3/8 inch thru 5/8 inch rod sizes are Underwriters Laboratories listed and Factory Mutual approved for use with maximum 4" size pipe. Complies with Federal Specification WW-H-171E (Type 19) and Manufacturers Standardization Society SP-69 (Type 18).

**FEATURES:**

- Suitable for use in concrete 2 inches thick due to low overall height.
- Highly competitive.
- Provides for 2 inches of lateral adjustment.
- Knockout prevents seepage of concrete from underneath the insert up into the insert body.
- One body size.
- Removable nut in four sizes.
- Rod can be rigidly locked in position.

**ORDERING:** Specify figure number, name, size of nut tapping if nut is required.

**loads • weights**

	nut size	maximum recommended load, lb	weight (approx) lbs each
insert complete	1/4	230	.46
with nut	3/8	400	.49
	1/2	400	.49
	5/8	400	.48
insert only	...	...	.41
nut only	1/4	...	.05
	3/8	...	.08
	1/2	...	.08
	5/8	...	.07

■ Based on insert and nut only. Rating is subject to the condition that the concrete used is of sufficient strength to hold the insert.

# Grinnell

## heavy-duty concrete insert

iron cross design

fig. 283



**MATERIAL:** Stainless steel body, fiberglass bars, polypropylene disc

**SIZE RANGE:** 3/4" - 1 1/2"

**SERVICE:** Upper attachment for suspending pipe or equipment from concrete ceiling.

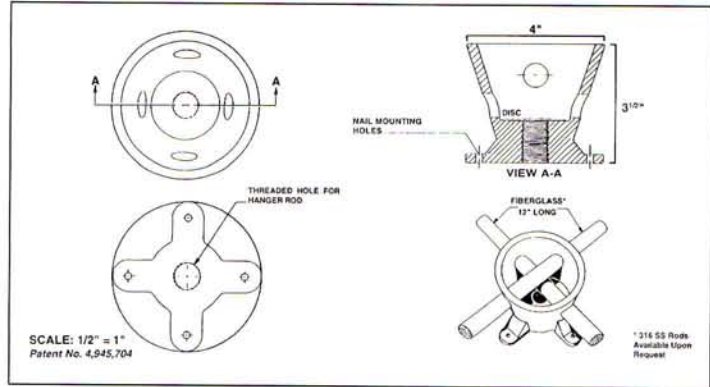
**INSTALLATION:**

- (1) Nail insert to wooden forms.
- (2) Where convenient, reinforcing rods may be placed in the opening through the top of the insert, or short lengths of reinforcing rod may be wired to the insert prior to pouring concrete. However, the specified load ratings and approvals are not dependent on the use of any reinforcing rods in contact with the insert.

**FEATURES:**

- Stainless steel body prevents corrosion.
- Cone shaped body.
- Exceptional pullout strength.
- Eliminates uncertainty of tying conventional inserts into bridge deck rebars.

**ORDERING:** Specify figure number, name, rod size.



Rod Size	Maximum Pipe Size	Maximum Load In Lbs
3/4 inch	6 inches	2710
7/8 inch	12 inches	3770
1 inch	16 inches	4960
1 1/4 inch	20 inches	8000
1 1/2 inch	24 inches	11630

## ceiling plates

plastic ceiling plate

fig. 127



**SIZE RANGE:** For use on 3/8 and 1/2 inch rod.

**MATERIAL:** Plastic.

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

**INSTALLATION:** Slide plate up rod until firm against ceiling.

**FEATURES:**

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

**ORDERING:** Specify rod size, figure number, name.

**weights • dimensions (inches)**

rod size	wgt (approx) lbs each	outside diam	depth
3/8	.01	1 13/16	1/2
1/2	.01	1 13/16	1/2

ceiling plate

fig. 395



**SIZE RANGE:** 1/2 to 8 inch pipe.

**MATERIAL:** Cast iron.

**FINISH:** Black or galvanized; furnished black unless otherwise specified.

**SERVICE:** Gives finished appearance where pipe enters ceiling.

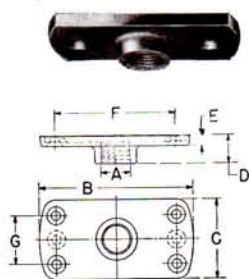
**INSTALLATION:** Sizes 1/2 to 4 inch furnished with one machine screw; sizes 5 to 8 inch, two machine screws.

**ORDERING:** Specify pipe size, figure number, name.

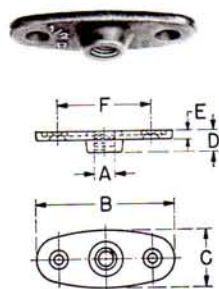
**weights**

pipe size in	weight (approx) lbs each	
	black	galv
1/2	.21	.22
3/4	.40	.41
1	.41	.42
1 1/4	.51	.52
1 1/2	.55	.56
2	.67	.69
2 1/2	.93	.95
3	1.1	1.1
3 1/2	1.2	1.3
4	1.4	1.4
5	2.5	2.5
6	3.1	3.1
8	3.3	3.3

**ceiling flange  
pipe threaded  
fig. 128**



**rod threaded  
fig. 128R**



**pipe threaded: fig. 128**

**loads • weights • packaging**

tapped pipe size A	maximum recommended load, lb	weight (approx) lbs each	number of pieces per carton
1/4	180	.20	25

**dimensions (inches)**

pipe tap A	B	C	D	E	F	G	screws	
							quantity	size no.
1/4	3 <sup>5</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>8</sub>	3/8	3/16	2 1/4	...	2	12

**MATERIAL:** Malleable iron

**FINISH:** Black or galvanized; furnished black unless otherwise specified (fig. 128/128R).

**SERVICE:** Recommended for attachment to wood beams or ceiling.

**ORDERING:** Specify rod or pipe tapping size, figure number, name.

**rod threaded: fig. 128R**

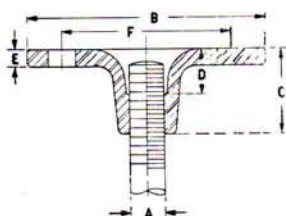
**loads • weights**

tapped rod size A	maximum recommended load, lb	weight (approx) lbs each
3/8	180	.16
1/2	180	.16

**dimensions (inches)**

rod size A	B	C	D	E	F	screws	
						quantity	size no.
3/8	3 <sup>5</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>8</sub>	1/2	3/16	2 1/4	2	12
1/2	3 <sup>5</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>8</sub>	1/2	3/16	2 1/4	2	12

**pipe hanger flange  
fig. 153**



**loads • weights**

rod size A	max recom load, lb	wgt (approx) lbs each	size screws
3/8	425	.42	1 1/2 no. 18
1/2	1050	.93	3/8 x 2
5/8	1220	1.5	1/2 x 2
3/4	1270	2.2	9/16 x 2

**dimensions (inches)**

rod size A	max. pipe size	B	C	D	E	screw circle diam, F
3/8	2	2 <sup>7</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>8</sub>	7/8	3/16	2
1/2	3 1/2	4	1 1/2	15/16	1/4	2 <sup>7</sup> / <sub>8</sub>
5/8	5	4 <sup>3</sup> / <sub>4</sub>	1 <sup>5</sup> / <sub>8</sub>	1	5/16	3 <sup>3</sup> / <sub>8</sub>
3/4	6	5 1/4	1 <sup>7</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>16</sub>	3/8	3 <sup>5</sup> / <sub>8</sub>

**MAXIMUM RECOMMENDED LOAD:** 1,270 lbs., suitable for use with up to 6 inch pipe.

**MATERIAL:** Malleable iron.

**FINISH:** Black.

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

**APPROVALS:** Underwriters' Laboratories listed and Factory Mutual approved for maximum pipe sizes indicated in table.

**INSTALLATION:**

Flange size 3/8 inch has two holes for wood screws; sizes 1/2, 5/8 and 3/4 inch have three holes for coach screws.

**FEATURES:**

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

**ORDERING:** Specify rod size, figure number, name.

# Grinnell

## trapeze

### universal trapeze assembly

fig. 46

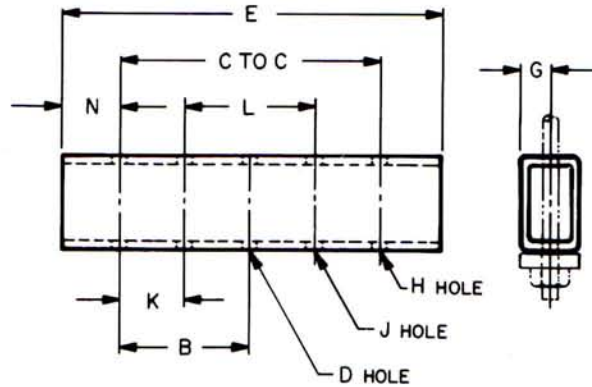


**MATERIAL:** Carbon Steel.

**FINISH:** Black.

**SERVICE:** Trapeze assembly is to be suspended by two rods with fig. 60 washer plates designed for top loading exclusively.

**ORDERING:** Specify size number, figure number, name, C to C dimension and hole size "H". If holes "J" or hole "D" are required, also specify hole size and dimensions "K" and "L" or "B".



### weights • dimensions (inches)

nom size	size of structural tubing	wgt per ft ↑ (lbs)	max hole dia H, J and D	G	N	C to C = span in inches															
						12	14	16	18	20	22	24	26	28	30	36	42	48	54	60	
						E Dimensions															
1	¼ x 2 x 2	5.40	1⅞	1	1½	15	17	19	21	23	25	27	29	31	33	39	...	...	...	...	
2	¼ x 3 x 2	7.10	1	1	1½	15	17	19	21	23	25	27	29	31	33	39	...	...	...	...	
3	¾/16 x 4 x 3	8.14	1⅝	1½	2½	17	19	21	23	25	27	29	31	33	35	41	47	53	59	65	
4	¼ x 4 x 4	12.00	1⅞	2	2⅝	17¼	19¼	21¼	23¼	25¼	27¼	29¼	31¼	33¼	35¼	41¼	47¼	53¼	59¼	65¼	
5	¼ x 6 x 4	15.42	2⅜	2	3⅜	18¾	20¾	22¾	24¾	26¾	28¾	30¾	32¾	34¾	36¾	42¾	48¾	54¾	60¾	66¾	
6	¼ x 8 x 4	18.80	2⅞	2	4	20	22	24	26	28	30	32	34	36	38	44	50	56	62	68	

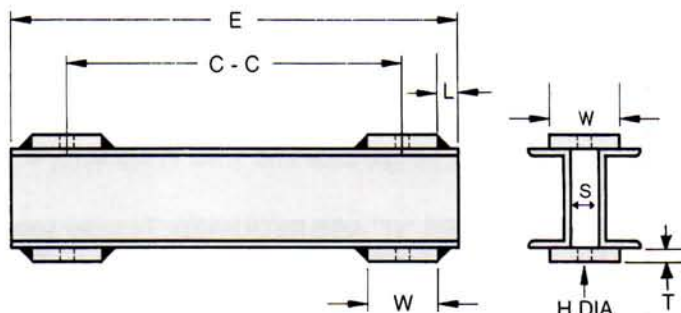
### loads

nom size	maximum recommended load (lbs) based on C to C dimension ■															
	12	14	16	18	20	22	24	26	28	30	36	42	48	54	60	
1	2600	2300	1900	1700	1500	1400	1300	1200	1100	1000	880	...	...	...	...	
2	6700	5700	5000	4500	4000	3600	3300	3100	2800	2700	2200	...	...	...	...	
3	8800	7500	6600	5800	5200	4800	4400	3900	3600	3500	2900	2500	2200	1900	1700	
4	15200	13100	11400	10200	9100	8300	7500	7000	6500	6100	5100	4300	3800	3300	3000	
5	23700	20600	18000	16000	14400	13100	12000	11100	10300	9600	8000	6800	6000	5300	4800	
6	40000	34300	30000	26600	24000	21800	20000	18400	17100	16000	13300	11400	10000	8800	8000	

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



## channel assembly fig. 45



### To Order Specify:

Figure 45 Channel Assembly, (Channel Size), (Rod Size), (C to C),

$$E = C \text{ to } C + 2L + W$$

Channel Mat'l.— ASTM A-36 CS

Washer Plate Mat'l.— ASTM A-36 or  
A-515 GR 65-70 CS

**FINISH:** Black, galvanized.

### Standard Dimensions (Inches)

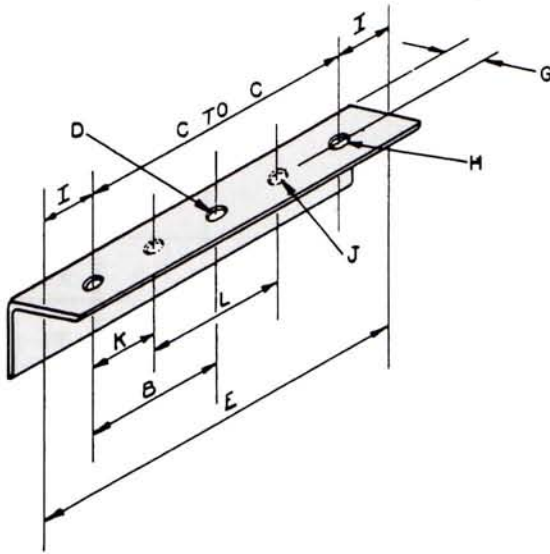
ROD DIA.	3/8	1/2	5/8	3/4	7/8	1	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2	2 3/4	3	3 1/4	3 1/2
H HOLE	1/2	5/8	3/4	7/8	1	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2	2 3/4	3	3 1/4	3 1/2	3 3/4
S	9/16	1 1/16	1 3/16	1 5/16	1 11/16	1 3/8	1 5/8	1 7/8	2 1/4	2 1/2	2 3/4	3	3 1/4	3 1/2	3 3/4	4
W	3	3	3	4	4	4	5	5	5	5	6	6	6	6	6	7
T	1/4	1/4	3/8	3/8	1/2	1/2	1/2	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4
L	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	3/8	1/2	1/2

### Safe Load Table

NOM. SIZE	WT. PER FT. 2 C's	C TO C = SPAN IN INCHES														
		12	14	16	18	20	22	24	26	28	30	36	42	48	54	60
3	8.2	8.8	7.5	6.6	5.8	5.2	4.8	4.4	3.9	3.6	3.5	2.9	2.5	2.2	1.9	1.7
4	10.8	15.2	13.10	11.4	10.2	9.1	8.3	7.5	7.0	6.5	6.1	5.1	4.3	3.8	3.3	3.0
5	13.4	24.0	20.6	18.0	16.0	14.4	13.1	12.0	11.1	10.3	9.6	8.0	6.8	6.0	5.3	4.8
6	21.0	40.0	34.3	30.0	26.6	24.0	21.8	20.0	18.4	17.1	16.0	13.3	11.4	10.0	8.8	8.0
8	23.0	64.8	55.5	48.6	43.2	38.8	35.3	32.3	29.8	27.7	25.8	21.5	18.5	16.1	14.3	12.9
10	30.6	107.2	91.7	80.3	71.4	64.2	58.4	53.5	49.4	45.8	42.8	35.7	30.6	26.7	23.8	21.4
12	41.4	171	147	128	114	103	93.4	85.6	79	73.3	68.4	57	48.9	42.8	38	34.2
15	67.8	333	286	250	222	200	182	167	154	143	133	111	95.3	83.4	74.1	66.7

# Grinnell

## equal leg angle for trapeze assembly fig. 50



**FINISH:** Black, galvanized.

**ORDERING:**

**IF SINGLE HOLE "H" IS REQUIRED:** To order specify: Fig. 50 Angle, (Angle Size and Total Weight), (E, G, H, I Dimensions).

**IF TWO HOLES "H" ARE REQUIRED:** To order specify: Fig. 50 Angle, (Angle Size and Total Weight), (C to C, E, G, H Dimensions).

**IF TWO HOLES "H" AND HOLE "D" ARE REQUIRED:** To order specify: Fig. 50 Angle, (Angle Size and Total Weight), (B, C to C, D, E, G, H Dimensions).

**IF TWO HOLES "H" AND TWO HOLES "J" ARE REQUIRED:** To order specify: Fig. 50 Angle, (Angle Size and Total Weight), (C to C, E, G, H, J, K, L Dimensions).

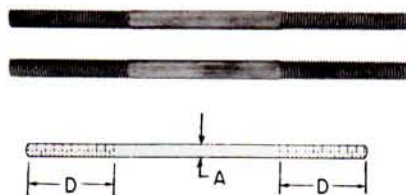
**MATERIAL:** ASTM A-36 Carbon Steel

### Safe Load Table

NOM. SIZE	WT. PER FT.	G IN.	I LAP IN.	MAX. ROD IN.	C TO C = SPAN IN INCHES										
					8	10	12	14	16	18	20	22	24	28	30
					MAXIMUM SAFE LOAD IN POUNDS										
1½ x ¼	2.34	⅞	1¼	½	780	624	520	446	390	346	312	284	260	223	208
2 x ¼	3.19	1⅞	1½	⅝	1500	1200	1000	856	750	667	600	545	500	428	400
2 x ⅜	4.7	1⅞	1½	¾	2100	1680	1400	1200	1050	933	840	763	700	600	560
2½ x ⅜	5.9	1⅞	1½	1	3420	2736	2280	1954	1710	1520	1368	1244	1140	977	912
3 x ⅜	7.2	1¾	1¾	1¼	4980	3984	3320	2846	2490	2130	1992	1810	1660	1423	1328
3 x ½	9.4	1¾	1¾	1¼	6600	5280	4400	3772	3300	2933	2640	2400	2200	1886	1760
4 x ½	12.8	2½	2	2	12000	9600	8000	6858	6000	5333	4800	4364	4000	3429	3200

## hanger rods

machine threaded rods  
 threaded both ends  
 right-hand threads: fig. 140  
 right- and left-hand threads: fig. 253



**MATERIAL:** Carbon steel.

**MAXIMUM TEMPERATURE:** 650°F.

**ORDERING:** Specify rod size, figure number, name, rod length. Specify thread length if other than standard.

**FINISH:** Black or electro-galvanized.

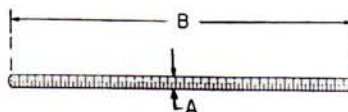
### loads • standard thread lengths

rod size A	maximum recommended load, lb		standard rod thread length D, in
	650°F	750°F	
3/8	610	540	2 1/2
1/2	1130	1010	2 1/2
5/8	1810	1610	2 1/2
3/4	2710	2420	3
7/8	3770	3360	3 1/2
1	4960	4420	4
1 1/4	8000	7140	5
1 1/2	11630	10370	6
1 3/4	15700	14000	7
2	20700	18460	8
2 1/4	27200	24260	9
2 1/2	33500	29880	10
2 3/4	41580	37066	11
3	50580	45085	12
3 1/4 •	60480	53906	13
3 1/2 •	71280	63493	14
3 3/4 •	82890	73855	15

• 3/8, 1/2 and 5/8 inch fig. 140 rod in lengths of 24 inch or shorter will be furnished as continuous thread rod unless order states that all thread rod is not acceptable.

• Furnished with 8 UN threads.

### continuous thread: 146



**SIZE RANGE:** 1/4 through 1 1/2 inch diameter.

Stocked in six, ten and twelve foot lengths. Other even foot lengths can be furnished to order.

**MATERIAL:** Carbon steel; rod threaded complete length.

**FINISH:** Black or electro-galvanized.

**MAXIMUM TEMPERATURE:** 650°F.

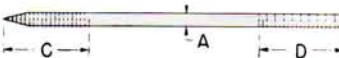
**ORDERING:** Specify rod diameter and length, figure number, name.

### loads • weights

rod size A	max recom load, lb	weight (approx) lbs ft
	650°F	
1/4	240	.12
3/8	610	.30
1/2	1130	.53
5/8	1810	.84
3/4	2710	1.2
7/8	3770	1.7
1	4960	2.3
1 1/4	8000	3.6
1 1/2	11630	5.1

### coach screw rods

machine threaded on opposite end:  
 fig. 142



**MATERIAL:** Carbon steel.

**ORDERING:** Specify rod size, figure number, name, rod length.

### standard thread lengths • loads

rod size	standard rod lengths	coach screw thread L, in	std rod thd D, in	max recom load, lb
3/8	3 1/2	2	3/4	390
3/8	8	2	2 1/2	390
1/2	3 1/2	2 7/16	3/4	640
1/2	8	2 7/16	2 1/2	640

# Grinnell

## hanger rods

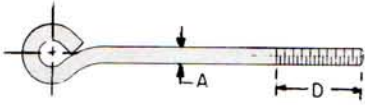
### eye rods



### not welded

right-hand threads: fig. 248

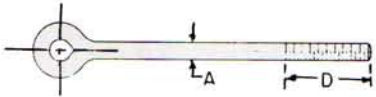
left-hand threads: fig. 248L



### welded

right-hand thread: fig. 278

left-hand thread: fig. 278L



**MATERIAL:** Carbon steel.

**FINISH:** Black or electro-galvanized.

**FEATURES:** Through 1½ inch, inside diameter of eye will accommodate a bolt diameter ⅛ inch larger than rod diameter; 1¾ inch and larger, inside diameter of eye will take a bolt diameter ¼ inch larger than rod diameter.

**MAXIMUM TEMPERATURE:** 650°F for Fig. 248; 750°F for Fig. 278.

**ORDERING:** Specify rod diameter, figure number, name, rod length. Specify thread length if other than standard.

## standard thread lengths • loads

rod size A	standard rod thread length D, in	L (minimum)	max. recom. load, lb		
			fig. 248		fig. 278
			650°F	650°F	750°F
⅜	2½	4¼	240	610	540
½	2½	4¼	240	1130	1010
⅝	2½	4¼	705	1810	1610
¾	3	5½	1050	2710	2420
⅞	3½	6½	1470	3770	3360
1	4	7½	1940	4960	4420
1¼	5	8½	3120	8000	7140
1½	6	10	4650	11630	10370
1¾	7	12	6380	15700	14000
2	8	14	8280	20700	18460
2¼	9	15½	10900	27200	24260
2½	10	17	13400	33500	29880

## linked eye rods

not welded: fig. 248X

welded: fig. 278X



**SERVICE:** The use of linked eye rods in a hanger assembly allows universal movement of the piping without bending and possible fracture of a straight rod.

**ORDERING:** Specify the length and size of each eye rod by figure number.

*example:*

- 1 — ⅞" fig. 278X linked welded eye rod consisting of:
- 1 — ⅞" fig. 278 welded eye rod 1 ft., 2½ inches long, center to end.
- 1 — ⅞" fig. 278 welded eye rod 1 ft., 2½ inches long, center to end.

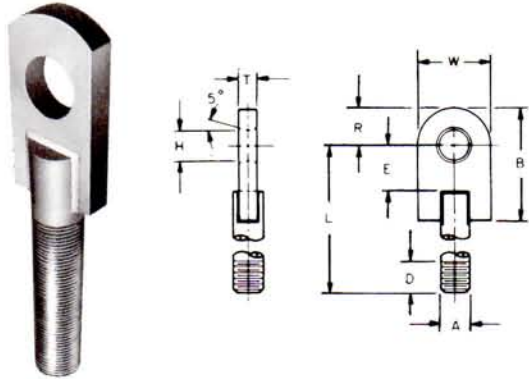
## loads

rod size A	maximum recommended load, lb	
	fig. 248X	fig. 278X
⅜	240	610
½	440	1130
⅝	705	1810
¾	1050	2710
⅞	1470	3770
1	1940	4960
1¼	3120	8000
1½	4650	11630
1¾	6380	15700
2	8280	20700
2¼	10900	27200
2½	13400	33500

■ maximum temperature 650°F.

hanger rods • pin

rod with eye end  
fig. 148



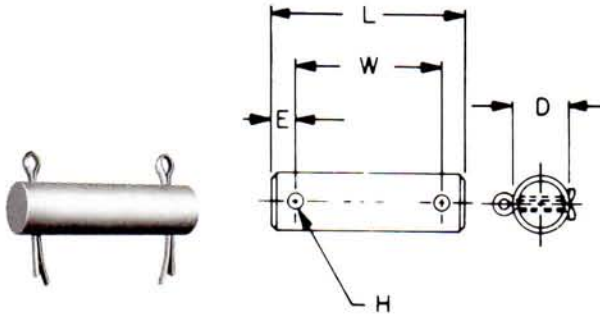
**SIZE RANGE:** Rod sizes 2¾ through 5 inch.  
**MATERIAL:** Carbon Steel.  
**FINISH:** Black.  
**SERVICE:** A large diameter rod with eye end for load ratings from 41,580 to 154,000 pounds.  
**ORDERING:** Specify rod size, figure number, name and "L" dimension. Indicate if desired thread length is other than standard.

loads • weights • dimensions (inches)

rod size A	maximum recom load (lb)*	wgt (approx) lbs each at min. lgth.	wgt. (approx.) lbs. per ft. of additional lgth.	B	D	E	H	with std thread L (min)	R	T	W
2¾	41580	35.9	20	9 <sup>5</sup> / <sub>8</sub>	12	3¾	3 <sup>1</sup> / <sub>8</sub>	19	3 <sup>5</sup> / <sub>8</sub>	1½	6
3	50580	42.9	24	11	12	4	3 <sup>3</sup> / <sub>8</sub>	20	4	1½	6
3¼*	60480	54.7	28	12 <sup>1</sup> / <sub>4</sub>	12	4	3 <sup>3</sup> / <sub>8</sub>	21	4 <sup>1</sup> / <sub>4</sub>	1½	7
3½*	71280	67.3	33	12 <sup>1</sup> / <sub>2</sub>	15	4¾	3 <sup>3</sup> / <sub>8</sub>	24	4 <sup>1</sup> / <sub>2</sub>	2	7
3¾*	82890	80.0	37	13 <sup>7</sup> / <sub>8</sub>	15	5	4 <sup>1</sup> / <sub>8</sub>	25	4 <sup>7</sup> / <sub>8</sub>	2	7½
4*	90069	97.0	43	15 <sup>1</sup> / <sub>8</sub>	15	5	4 <sup>3</sup> / <sub>8</sub>	26	5 <sup>1</sup> / <sub>8</sub>	2	8½
4¼*	95217	127.0	48	16 <sup>1</sup> / <sub>4</sub>	18	5¼	4 <sup>5</sup> / <sub>8</sub>	30	5 <sup>1</sup> / <sub>2</sub>	2	9½
4½*	123000	131.0	54	16	18	5¾	4 <sup>7</sup> / <sub>8</sub>	30	5 <sup>3</sup> / <sub>4</sub>	2½	8½
4¾*	138000	154.0	60	17	18	5¾	5 <sup>1</sup> / <sub>8</sub>	31	6	2½	9½
5*	154000	175.0	67	17 <sup>7</sup> / <sub>8</sub>	18	6¼	5¾	32	6 <sup>3</sup> / <sub>8</sub>	2½	10

◆ Weight calculated with minimum "L" for standard thread  
 ■ Based on the allowable stresses shown in the ASME Code for Pressure Piping.  
 • Furnished with 8 UN series threads.

clevis pin with cotters  
fig. 291



**SIZE RANGE:** ½ through 4 inch.  
**MATERIAL:** Carbon steel.  
**FINISH:** Black or galvanized.  
**SERVICE:** for use with type C variable spring hanger, type C constant support (Fig. 81-H only) and Fig. 66 welded beam attachment.  
**ORDERING:** Specify pin diameter, figure number and name.

loads • weights • dimensions (inches)

pin diameter D	max recom load (lbs)*	wgt (approx) lb each	L	W	E	H	cotter pin size
½	610	.12	2 <sup>7</sup> / <sub>8</sub>	2 <sup>1</sup> / <sub>8</sub>	¾		
5/8	1130	.18	3 <sup>1</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>8</sub>	¾	5/32	1/8 x 1¼
¾	1810	.29	2 <sup>15</sup> / <sub>16</sub>	2 <sup>3</sup> / <sub>16</sub>	¾		3/16 x 1½
7/8	2710	.47	3 <sup>7</sup> / <sub>8</sub>	3½	¾		
1	3770	.67	4	3¼	¾	7/32	3/16 x 2
1½	4960	1.0	4¼	4	¾		
1¼	6230	1.7	4 <sup>7</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>8</sub>	¾		
1¾	8000	2.1	5 <sup>3</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>8</sub>	½	9/32	¼ x 2
1⅝	11630	3.3	6	5	½		
1⅞	15700	4.8	7 <sup>1</sup> / <sub>8</sub>	5 <sup>7</sup> / <sub>8</sub>	5/8		¾ x 3
2¼	20700	7.2	7 <sup>1</sup> / <sub>8</sub>	5 <sup>7</sup> / <sub>8</sub>	5/8	3/8	¾ x 3¼
2½	27200	9.3	7 <sup>5</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>	5/8		¾ x 3¾
2¾	33500	12.5	7 <sup>7</sup> / <sub>8</sub>	6 <sup>5</sup> / <sub>8</sub>	5/8		¾ x 4
3	41580	16.6	8¼	6¾	¾		
3¼	50580	20.0	8½	7	¾	½	½ x 5
3½	60480	23.9	8¾	7¼	¾		
3¾	71280	25.1	9½	8	¾		
4	82890	34.8	9¾	8¼	¾		½ x 6

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

# Grinnell

## bolts

### machine bolts



American Standard hexagon head bolts with American Standard hexagon nuts are stocked for immediate shipment in sizes  $\frac{3}{8}$ ,  $\frac{1}{2}$ ,  $\frac{5}{8}$ ,  $\frac{3}{4}$ ,  $\frac{7}{8}$ , 1 and  $1\frac{1}{8}$  inch.

UNC thread series.

Lengths of bolts are measured from under head to extreme point.

**ORDERING:** Specify bolt size, name, length.

### hexagon nuts

American Standard hexagon nuts — sizes  $\frac{1}{4}$  thru  $1\frac{1}{2}$  inch.

American Standard heavy hexagon flat nuts — sizes  $1\frac{3}{4}$  thru  $3\frac{3}{4}$  inch.

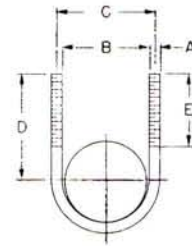
**ORDERING:** Specify bolt size, name.

### dimensions (inches)

bolt size	width	thickness
$\frac{1}{4}$	$\frac{7}{16}$	$\frac{15}{64}$
$\frac{3}{8}$	$\frac{9}{16}$	$\frac{11}{32}$
$\frac{1}{2}$	$\frac{3}{4}$	$\frac{29}{64}$
$\frac{5}{8}$	$\frac{15}{16}$	$\frac{9}{16}$
$\frac{3}{4}$	$1\frac{1}{8}$	$\frac{43}{64}$
$\frac{7}{8}$	$1\frac{5}{16}$	$\frac{25}{32}$
1	$1\frac{1}{2}$	$\frac{57}{64}$
$1\frac{1}{4}$	$1\frac{7}{8}$	$\frac{13}{32}$
$1\frac{3}{8}$	$2\frac{1}{16}$	$\frac{113}{64}$
$1\frac{1}{2}$	$2\frac{1}{4}$	$\frac{15}{16}$
$1\frac{3}{4}$	$2\frac{3}{4}$	$\frac{125}{32}$
2	$3\frac{1}{8}$	$\frac{21}{32}$
$2\frac{1}{4}$	$3\frac{1}{2}$	$\frac{219}{64}$
$2\frac{1}{2}$	$3\frac{7}{8}$	$\frac{235}{64}$
$2\frac{3}{4}$	$4\frac{1}{4}$	$\frac{213}{16}$
3	$4\frac{5}{8}$	$\frac{31}{16}$
$3\frac{1}{4}$ ■	5	$\frac{35}{16}$
$3\frac{1}{2}$ ■	$5\frac{3}{8}$	$\frac{39}{16}$
$3\frac{3}{4}$ ■	$5\frac{3}{4}$	$\frac{313}{16}$

■ Furnished with 8 UN series threads.

### light weight U-bolt fig. 120



**SIZE RANGE:**  $\frac{1}{2}$  to 10 inch pipe and conduit.

**MATERIAL:** Carbon steel.

**FINISH:** Black or electro-galvanized; furnished black unless otherwise specified.

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

**MAXIMUM TEMPERATURE:** 650°F.

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

### loads • weights • dimensions (inches)

pipe size	max recom load, lb	wgt app'x lbs each	rod size A	B	C	D	E
$\frac{1}{2}$	485	.06	$\frac{1}{4}$	$\frac{15}{16}$	$\frac{13}{16}$	$\frac{115}{16}$	$\frac{13}{4}$
$\frac{3}{4}$	485	.07	$\frac{1}{4}$	$1\frac{1}{8}$	$1\frac{3}{8}$	$2\frac{1}{16}$	$1\frac{3}{4}$
1	485	.07	$\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{5}{8}$	$2\frac{3}{16}$	$1\frac{3}{4}$
$1\frac{1}{4}$	485	.08	$\frac{1}{4}$	$1\frac{11}{16}$	$1\frac{15}{16}$	$2\frac{3}{8}$	$1\frac{3}{4}$
$1\frac{1}{2}$	485	.09	$\frac{1}{4}$	2	$2\frac{1}{4}$	$2\frac{7}{16}$	$1\frac{3}{4}$
2	485	.10	$\frac{1}{4}$	$2\frac{7}{16}$	$2\frac{11}{16}$	$2\frac{11}{16}$	$1\frac{3}{4}$
$2\frac{1}{2}$	1220	.28	$\frac{3}{8}$	$2\frac{15}{16}$	$3\frac{5}{16}$	$3\frac{1}{16}$	2
3	1220	.31	$\frac{3}{8}$	$3\frac{9}{16}$	$3\frac{15}{16}$	$3\frac{3}{8}$	2
$3\frac{1}{2}$	1220	.35	$\frac{3}{8}$	$4\frac{1}{16}$	$4\frac{7}{16}$	$3\frac{5}{8}$	2
4	1220	.38	$\frac{3}{8}$	$4\frac{9}{16}$	$4\frac{15}{16}$	$3\frac{7}{8}$	2
5	1220	.45	$\frac{3}{8}$	$5\frac{5}{8}$	6	$4\frac{9}{16}$	$2\frac{1}{4}$
6	2260	.95	$\frac{1}{2}$	$6\frac{3}{4}$	$7\frac{1}{4}$	$5\frac{1}{16}$	$2\frac{1}{4}$
8	2260	1.2	$\frac{1}{2}$	$8\frac{3}{4}$	$9\frac{1}{4}$	$6\frac{1}{16}$	$2\frac{1}{4}$
10	3620	2.3	$\frac{5}{8}$	$10\frac{7}{8}$	$11\frac{1}{2}$	$7\frac{1}{4}$	$2\frac{1}{2}$

### standard U-bolt

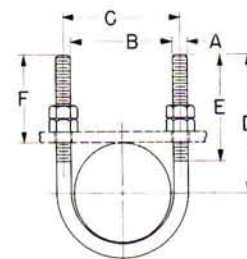
fig. 137

### special U-bolt (non-standard)

fig. 137S\*

### plastic coated

fig. 137C



**SIZE RANGE:** 1/2 through 36 inch pipe.

**MATERIAL:** Carbon steel U-bolt and four finished hex nuts.

**FINISH:** Black or galvanized.

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

**MAXIMUM TEMPERATURE:** 750°F.

**APPROVALS:** Complies with Federal Specification WW-H-171E (Type 24) and Manufacturers Standardization Society SP-69 (Type 24).

**ORDERING FIG. 137:** Specify rod size x pipe size (as 5/8 x 6), figure number, name. U-bolt will be furnished with longer tangents D or with longer threads E if so required and ordered. If hex nuts are not required, specify "without hex nuts."

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

**SPECIAL NOTE:** When furnished hot-dip galvanized, oversize hex nuts must be used.

### fig. 137C coated U-bolt

**SIZE RANGE:** 1/2 to 8 inch pipe.

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

**SERVICE:** Recommended for support, anchor or guide for glass, copper, brass and aluminum pipe.

**MAXIMUM TEMPERATURE:** 225°F.

**ORDERING:** Specify rod size x pipe size (as 3/8 x 2), figure number, name. If hex nuts are not required, specify "without hex nuts."

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

$$\frac{P_t}{P_{tA}} + \frac{P_s}{P_{sA}} \leq 1$$

Where:  $P_t$  = the actual applied normal load  
 $P_{tA}$  = the allowable normal load for the Fig. 137  
 $P_s$  = the actual applied side load  
 $P_{sA}$  = the allowable side load for the Fig. 137

### load • weights • packaging • dimensions (inches)

pipe size	rod size A	maximum recommended load, lb*		650°F maximum side load, lb*	weight with nuts (approx) lbs each	B	C	D	E	F
		650°F	750°F							
1/2	1/4	485	435	63	.11	15/16	13/16	23/4	21/8	25/16
3/4	1/4	485	435	63	.12	1 1/8	1 3/8	2 3/4	2 1/8	2 7/32
1	1/4	485	435	63	.12	1 3/8	1 5/8	2 3/4	2 1/8	2 3/32
1 1/4	3/8	1220	1090	194	.28	1 11/16	2 1/16	2 7/8	2 1/8	2 1/32
1 1/2	3/8	1220	1090	194	.30	2	2 3/8	3	2 1/2	2 1/16
2	3/8	1220	1090	194	.33	2 7/16	2 13/16	3 1/4	2 1/2	2 1/16
2 1/2	1/2	2260	2020	184	.73	2 15/16	3 7/16	3 3/4	3	2 5/16
3	1/2	2260	2020	184	.78	3 9/16	4 1/16	4	3	2 1/4
3 1/2	1/2	2260	2020	184	.84	4 1/16	4 9/16	4 1/4	3	2 1/4
4	1/2	2260	2020	184	.90	4 9/16	5 1/16	4 1/2	3	2 1/4
5	1/2	2260	2020	184	1.0	5 5/8	6 1/8	5	3	2 7/32
6	5/8	3620	3230	277	2.0	6 3/4	7 3/8	6 1/8	3 3/4	2 13/16
8	5/8	3620	3230	277	2.3	8 3/4	9 3/8	7 1/8	3 3/4	2 13/16
10	3/4	5420	4830	400	4.9	10 7/8	11 5/8	8 3/8	4	3
12	7/8	7540	6730	422	7.7	12 7/8	13 3/4	9 5/8	4 1/4	3 1/4
14	7/8	7540	6730	422	8.3	14 1/8	15	10 1/4	4 1/4	3 1/4
16	7/8	7540	6730	422	9.2	16 1/8	17	11 1/4	4 1/4	3 1/4
18	1	9920	8850	...	13.5	18 1/8	19 1/8	12 5/8	4 3/4	3 5/8
20	1	9920	8850	...	14.6	20 1/8	21 1/8	13 5/8	4 3/4	3 5/8
24	1	9920	8850	...	16.9	24 1/8	25 1/8	15 5/8	4 3/4	3 5/8
28	1	9920	8850	...	18.0	28 1/8	29 1/8	17 5/8	4 3/4	3 5/8
30	1	9920	8850	...	19.1	30 1/8	31 1/8	18 5/8	4 3/4	3 5/8
36	1	9920	8850	...	23.2	36 1/8	37 1/8	21 5/8	4 3/4	3 5/8

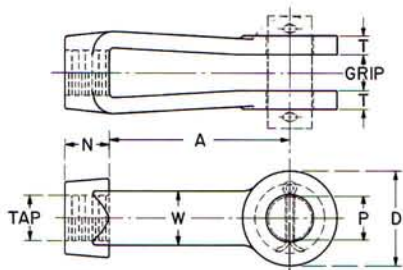
\* Loads, weights and dimensions shown do not apply for Fig. 137S.

# Grinnell

## rod attachments

### forged steel clevis

fig. 299



**MATERIAL:** Forged steel.

**FINISH:** Black or galvanized.

**SERVICE:** For use on high temperature piping installation.

**APPROVALS:** Complies with Federal Specification WW-H-171E (Type 14) and Manufacturers Standardization Society SP-69 (Type 14).

**FEATURES:**

- Complies fully with the code for pressure piping.
- Supports loads equal to the full limitation of the hanger rod.
- Available with pin and cotter pins, if required.

**ORDERING:** Specify rod size, figure number, name. If pin and cotter pins are required, specify "with pin." If other than standard combination of clevis size and rod tapping size is required, specify clevis number, special rod tapping size, pin size, grip.

**CAUTION:** Order by rod size.

**FINISH:** Black or galvanized.

### loads • weights • dimensions (inches)

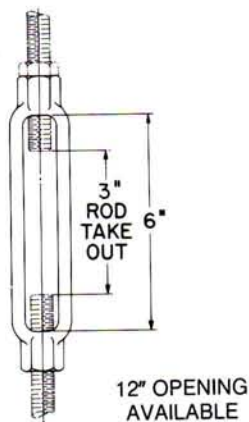
rod size	max recommended load, lbs		weight (approx) lbs each		rod take out A	D	N	pin size P	T	W	grip	size no.
	650°F	750°F	without pin	with pin								
3/8	610	540	.9	1.0				1/2			1/2	
1/2	1130	1010	.7	.9	3 11/16	1 7/16	5/8	5/8	5/16	1 1/16	1/2	2
5/8	1810	1610	.7	.9				3/4			5/8	
3/4	2710	2420	2.5	3.0	5	2	7/8	7/8	3/8	1 1/4	3/4	2 1/2
7/8	3770	3360	2.5	3.4				1			7/8	
1	4960	4420	4.0	5.1	5	3	1 5/16	1 1/8	1/2	1 1/2	1	3
1 1/4	8000	7140	3.8	5.5				1 3/8			1 1/4	
1 1/2	11630	10370	6.0	8.5	6	3 1/2	1 5/8	1 5/8	1/2	1 3/4	1 1/2	3 1/2
1 3/4	15700	14000	8.0	12.9	6	4	1 3/4	1 7/8	1/2	2	1 1/2	4
2	20700	18460	16.0	23.3	7	5	2 1/4	2 1/4	5/8	2 1/2	2 1/2	5
2 1/4	27200	24260	26.0	35.1	8	6	2 3/4	2 1/2	3/4	3	2 1/2	6
2 1/2	33500	29880	25.5	36.0				2 3/4			2 1/2	
2 3/4	41580	37066	36.0	50.0	9	7	3	3	7/8	3 1/2	2 1/2	7
3	50580	45085	35.0	51.5				3 1/4			2 1/2	
3 1/4 ♦	60480	53906	90.0	116.0				3 1/2			4	
3 1/2 ♦	71280	63493	88.0	118.0	10	8	4	3 3/4	1 1/2	4	4	8
3 3/4 ♦	82890	73855	86.0	120.0				4			4	
4 ♦	95400	85001	84.0	122.0				4 1/4			4	

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

♦ Furnished with 8 UN series threads.



**turnbuckle**  
**fig. 230**



**MATERIAL:** Forged steel.

**FINISH:** Black or galvanized.

**SERVICE:** Provides adjustment up to 12 inches for heavy loads.

**APPROVALS:** Complies with Federal Specification WW-H-171E (Type 13) and Manufacturers Standardization Society SP-69 (Type 13).

**ORDERING:** Specify rod size, figure number, name. Stub ends furnished only upon request.

**loads • weights**

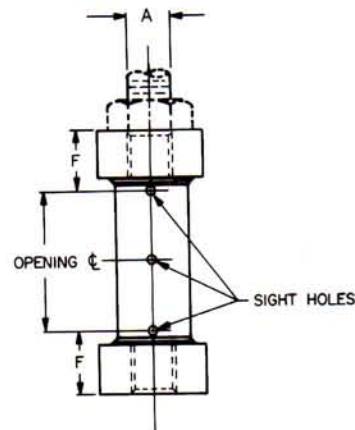
• rod size	max recom load, lb		6" opening wgt (approx) lbs each	12" opening wgt (approx) lbs each
	650°F	750°F		
3/8	610	540	.42	—
1/2	1130	1010	.65	1.2
5/8	1810	1610	.98	1.58
3/4	2710	2420	1.5	2.35
7/8	3770	3360	1.9	4.05
1	4960	4420	2.6	4.02
1 1/4	8000	7140	4.5	—
1 1/2	11630	10370	6.4	—
1 3/4	15700	14000	11.0	—
2	20700	18460	14.9	—
2 1/4	27200	24260	19.6	—
2 1/2	33500	29880	26.9	—

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

• Tapped right hand and left hand thread

**rod attachments**

**turnbuckle**  
**fig. 233**



**SIZE RANGE:** For use with rod sizes 1 1/4 through 5 inch.

**MATERIAL:** Carbon Steel.

**FINISH:** Black.

**SERVICES:** Provides adjustments up to 24 inches with loads from 8,000 to 154,000 pounds.

**ORDERING:** Specify rod size, figure number, name and opening dimension.

**loads • weights • dimensions (inches)**

▲ rod size (inches) A	maximum recom load (lb)■	weight (approx) lbs each				F
		Opening				
		6"	12"	18"	24"	
1 1/4	8000	...	9.0	10.8	12.6	2 1/8
1 1/2	11630	...	12.4	14.9	17.4	2 3/8
1 3/4	15700	...	11.7	14.2	16.7	2 3/8
2	20700	...	20.9	24.7	28.5	3 3/16
2 1/4	27200	...	29.5	34.6	39.7	3 1/4
2 1/2	33500	...	28.3	33.4	38.5	3 1/4
2 3/4	41580	35.6	41.8	48.1	54.3	3 1/2
3	50580	41.6	49.1	56.6	64.1	3 3/16
3 1/4 *	60480	39.6	47.0	54.5	62.0	3 3/16
3 1/2 *	71280	72.5	82.9	93.3	103.7	4 7/16
3 3/4 *	82890	69.6	80.0	90.4	107.3	4 7/16
4 *	95400	110.7	125.1	139.4	153.6	5
4 1/4 *	109000	107.1	121.5	135.7	150.0	5
4 1/2 *	123000	233.5	255.2	276.9	298.6	6 13/16
4 3/4 *	138000	227.6	249.3	271.0	292.7	6 13/16
5 *	154000	221.4	243.1	264.8	286.5	6 13/16

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

\*Furnished with 8 UN series threads.

▲ Tapped right hand and left hand thread

# Grinnell

## rod attachments

### rod coupling

straight: fig. 136

reducing: fig. 136R



**MATERIAL:** Malleable iron.

**FINISH:** Black or galvanized.

**SERVICE:** For connecting rod lengths within limitation.

**APPROVALS:** The Figure 136 is Underwriters' Laboratories listed and Factory Mutual approved for maximum pipe sizes, as indicated below.

#### FEATURES:

- Available in reducing sizes.
- Provides visual inspection.
- Uniform strength; good appearance.

**ORDERING:** Specify rod tapping size, figure number, name. Furnished with right-hand UNC threads only.

#### loads • weights • packaging • dimensions (inches)

rod tapping	maximum recommended load, lb	weight (approx) lbs each	overall length
-------------	------------------------------	--------------------------	----------------

#### straight: fig. 136

1/4	230	.06	1 3/8
3/8	610	.10	1 5/8
1/2	1130	.20	2 1/8
5/8	1810	.33	2 1/2
3/4	2710	.44	2 5/8
7/8	3770	.96	2 3/16
1	4960	.94	2 3/4

#### reducing: fig. 136R

3/8 x 1/4	230	.10	1 5/8
1/2 x 3/8	610	.21	2 1/8

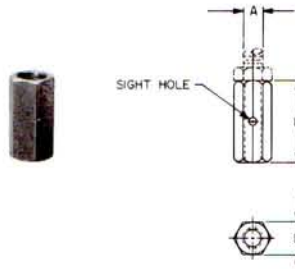
rod size	max pipe size
3/8	2
1/2	3 1/2
5/8	5
3/4	6
7/8	8

## steel rod coupling

straight with sight-hole: fig. 135

straight less sight-hole: fig. 135E

reducing: fig. 135R



**MATERIAL:** Carbon steel.

**FINISH:** Black.

**SERVICE:** For connecting rods to accommodate up to 1 inch diameter and support up to 4960 pounds.

**ORDERING:** Specify rod size, figure number and name.

rod size	maximum recommended load, lb	weight (approx) lbs each	D	L
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#### fig. 135

1/2	1130	.12	3/4	1 1/2
5/8	1810	.24	15/16	1 7/8
3/4	2710	.42	1 1/8	2 1/4
7/8	3770	.66	1 5/16	2 5/8
1	4960	1.0	1 1/2	3

#### fig. 135E

1/4	240	.03	3/8	7/8
3/8	610	.09	5/8	1 3/4
1/2	1130	.14	11/16	1 3/4
5/8	1810	.26	13/16	2 1/4
3/4	2710	.34	1	2 1/4

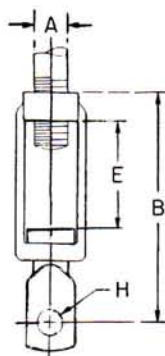
#### fig. 135R

3/8 x 1/4	240	.13	5/8	1 3/4
1/2 x 3/8	610	.13	11/16	1 3/4
5/8 x 1/2	1130	.19	13/16	2 1/8
3/4 x 5/8	1810	.32	1	2 1/4
7/8 x 3/4	2710	.41	1 1/4	2 1/2

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

## rod attachments

**turnbuckle adjuster**  
fig. 114



**MATERIAL:** Malleable iron.

**FINISH:** Black.

**INSTALLATION:** Normally used with split pipe ring, fig. 108.

**APPROVALS:** Complies with Federal Specification WW-H-171 E (Type 15) and Manufacturers Standardization Society SP-69 (Type 15).

**FEATURES:**

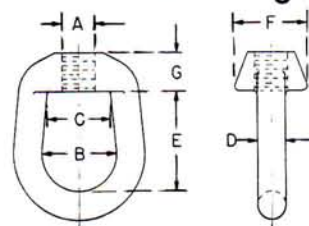
- An economical and simple means of obtaining vertical adjustment and flexibility at the pipe connection.
- Permits adjustment after pipe is in place.

**ORDERING:** Specify rod tapping size, figure number, name.

**loads • weights • packaging • dimensions (inches)**

rod tapping size, A	pipe size	max recom load, lb*	wgt (app'x) lb each	no. of pieces per carton	B	E	H
1/4	3/8	230	.09	...	2 1/2	1 1/4	7/32
3/8	1/2 to 2	610	.28	50	3 13/16	1 7/8	13/32
1/2	2 1/2 to 3 1/2	725	.31	50	3 13/16	1 13/16	13/32
5/8	4 to 5	710	.72	25	4 7/8	2 5/16	1/2
3/4	6	860	.70	25	4 15/16	2 5/16	9/16

**weldless eye nut**  
right-hand thread: fig. 290  
left-hand thread: fig. 290L



**MAXIMUM RECOMMENDED LOAD:** 33,500 lbs.

**MATERIAL:** Forged steel.

**FINISH:** Black or galvanized.

**SERVICE:** For use on high temperature piping installations.

**APPROVALS:** Complies with Federal Specification WW-H-171E (Type 17) and Manufacturers Standardization Society SP-69 (Type 17).

**FEATURES:**

- Supports loads equal to the full limitation of the hanger rod.
- Provides flexible connection when used with straight thread rod.

**ORDERING:** Specify rod size, figure number, name. If other than standard combination of eye nut and rod size, specify eye nut size and special rod tapping size.

**loads • weights**

rod size A	max recom load, lb*		wgt (approx) lbs each
	650 F	750 F	
3/8	610	540	.63
1/2	1130	1010	.63
5/8	1810	1610	.62
3/4	2710	2420	.60
7/8	3770	3360	1.7
1	4960	4420	1.7
1 1/4	8000	7140	3.6
1 1/2	11630	10370	3.5
1 3/4	15700	14000	16.4
2	20700	18460	15.9
2 1/4	27200	24260	15.4
2 1/2	33500	29880	14.9

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

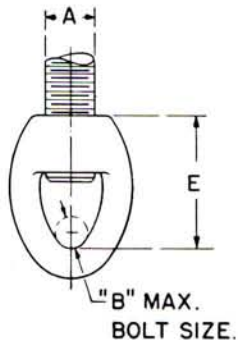
**dimensions (inches)**

rod size A	B	C	D	rod take out E	F	G	size no.
3/8							
1/2	1 1/2	1 3/16	1/2	2	1 3/8	1 11/16	1
5/8							
3/4							
7/8	2	1 11/16	3/4	2 5/8	1 15/16	1	2
1							
1 1/4	2 1/2	1 13/16	1	3 3/8	2 3/8	1 1/4	3
1 1/2							
1 3/4							
2	4	4	1 1/2	6 1/4	4	2 1/4	4
2 1/4							
2 1/2							

# Grinnell

## rod attachments

socket  
rod threaded: fig. 110R



**MATERIAL:** Malleable iron.

**FINISH:** black.

**SERVICE:** For attaching hanger rod to various types of building attachments.

**APPROVALS:** Underwriters' Laboratories listed and Factory Mutual approved for rod tapping sizes  $\frac{3}{8}$  to  $\frac{7}{8}$  inch. Complies with Federal Specification WW-H-171E (Type 16) and Manufacturers Standardization Society SP-69 (Type 16).

**INSTALLATION:** Normally used with the split pipe ring fig. 108, page ph-7.

**ORDERING:** Specify rod tapping size, figure number, name.

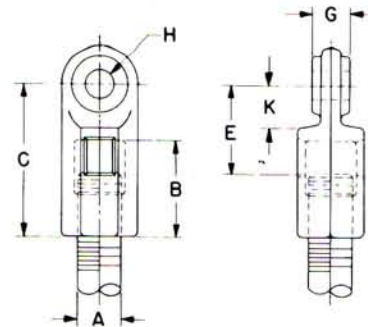
### loads • weights • dimensions (inches)

rod tapping size, A	max pipe size	max recom load, lb■	weight (approx) lbs each	B	E
$\frac{1}{4}$	*	650	.05	$\frac{1}{4}$	$1\frac{1}{8}$
$\frac{3}{8}$	4	800	.07	$\frac{1}{4}$	$1\frac{11}{32}$
$\frac{1}{2}$	8	1000	.13	$\frac{1}{4}$	$1\frac{17}{32}$
$\frac{5}{8}$	10	1400	.19	$\frac{3}{8}$	$1\frac{13}{16}$
$\frac{3}{4}$	12	2200	.31	$\frac{1}{2}$	$2\frac{5}{32}$
$\frac{7}{8}$	12	2300	.44	$\frac{1}{2}$	$2\frac{11}{32}$

\*Not Applicable.

■ Maximum temperature of 450°F.

extension piece  
fig. 157



**MATERIAL:** Malleable iron.

**FINISH:** Black or galvanized.

**SERVICE:** For attaching hanger rod to various types of building attachments.

**APPROVALS:** Underwriters' Laboratories listed and Factory Mutual approved for rod tapping sizes  $\frac{3}{8}$  to  $\frac{7}{8}$  inch.

**INSTALLATION:** May be used to form an integral part of malleable iron clamps figs. 218 and 225.

**FEATURES:** Provides for one inch adjustment of rod.

**ORDERING:** Specify rod tapping size, figure number, name.

### loads • weights

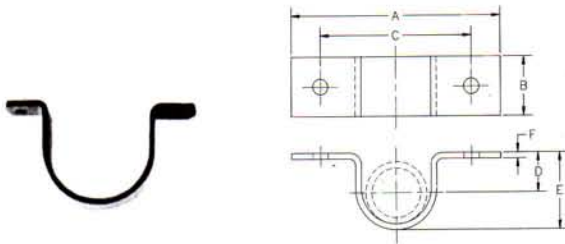
rod tapping size, A	max recom load, lb■	wgt (approx) lbs each
$\frac{3}{8}$	610	.20
$\frac{1}{2}$	1130	.40
$\frac{5}{8}$	1550	.44
$\frac{3}{4}$	2100	.65
$\frac{7}{8}$	2350	.78

■ Maximum temperature of 450°F.

### dimensions (inches)

rod tapping size, A	pipe size	B	C	rod take-out E	G	H	K
$\frac{3}{8}$	2	$1\frac{1}{4}$	$2\frac{1}{16}$	$1\frac{1}{4}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{9}{16}$
$\frac{1}{2}$	$3\frac{1}{2}$	$1\frac{3}{8}$	$2\frac{5}{16}$	$1\frac{3}{8}$	$\frac{5}{8}$	$\frac{1}{2}$	$1\frac{11}{16}$
$\frac{5}{8}$	5	$1\frac{1}{2}$	$2\frac{7}{16}$	$1\frac{7}{16}$	$\frac{5}{8}$	$\frac{1}{2}$	$\frac{3}{4}$
$\frac{3}{4}$	6	$1\frac{3}{4}$	$2\frac{7}{8}$	$1\frac{11}{16}$	$\frac{5}{8}$	$\frac{1}{2}$	$\frac{7}{8}$
$\frac{7}{8}$	12	$1\frac{7}{8}$	3	$1\frac{3}{4}$	$\frac{3}{4}$	$\frac{9}{16}$	$\frac{7}{8}$

### strap short: fig. 262



**SIZE RANGE:** ½ to 4 inch pipe.

**MATERIAL:** Carbon Steel.

**MAXIMUM TEMPERATURE:** 650°F.

**APPROVALS:** Complies with Federal Specification WW-H-17E (Type 26) and Manufacturers Standardization Society SP-69 (type 26).

**ORDERING:** Specify pipe size, figure number, name.

**FINISH:** Black.

#### loads • weights

pipe size	max recom load, lb		weight (approx) lbs each	size screws
	with lag screws	with bolts to steel		
½	300	410	.20	two no. 18 x 2 steel wood screws or two ¼ inch bolts to steel
¾	300	410	.23	
1	300	410	.26	
1¼	300	410	.36	
1½	300	410	.54	
2	300	410	.60	two no. 18 x 3 steel wood screws or two ¼ inch bolts to steel
2½	450	610	1.4	
3	450	610	1.6	
3½	450	610	1.8	
4	450	610	1.9	

#### dimensions (inches)

pipe size	A	B	C	D	E	F
½	3 <sup>15</sup> / <sub>16</sub>	1¼	2 <sup>11</sup> / <sub>16</sub>	½	1⅞	⅞
¾	4¼	1¼	3	11 <sup>1</sup> / <sub>16</sub>	1 <sup>7</sup> / <sub>16</sub>	⅞
1	4½	1¼	3¼	¾	1 <sup>5</sup> / <sub>8</sub>	⅞
1¼	4 <sup>15</sup> / <sub>16</sub>	1¼	3 <sup>11</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	2⅞	⅞
1½	5 <sup>7</sup> / <sub>16</sub>	1¼	4 <sup>3</sup> / <sub>16</sub>	1¼	2 <sup>7</sup> / <sub>16</sub>	⅞
2	6	1¼	4¾	1 <sup>3</sup> / <sub>8</sub>	2 <sup>13</sup> / <sub>16</sub>	⅞
2½	6½	1½	5¼	1¾	3 <sup>9</sup> / <sub>16</sub>	¼
3	7⅞	1½	5⅞	1 <sup>7</sup> / <sub>8</sub>	4	¼
3½	7 <sup>5</sup> / <sub>8</sub>	1½	6 <sup>3</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>16</sub>	4 <sup>9</sup> / <sub>16</sub>	¼
4	8¼	1½	7	2 <sup>7</sup> / <sub>16</sub>	5 <sup>1</sup> / <sub>16</sub>	¼

### one-hole clamp fig. 126



**SIZE RANGE:** ¾ to 4 inch pipe.

**MATERIAL:** Malleable iron.

**FINISH:** Black plated.

**SERVICE:** For support of standard conduit, cable or wrought iron and steel pipe on walls or sides of beams. Not recommended for use horizontally on ceilings, bottoms of beams and similar installations since the factor of safety is greatly reduced when so used.

**MAXIMUM TEMPERATURE:** 450°F.

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

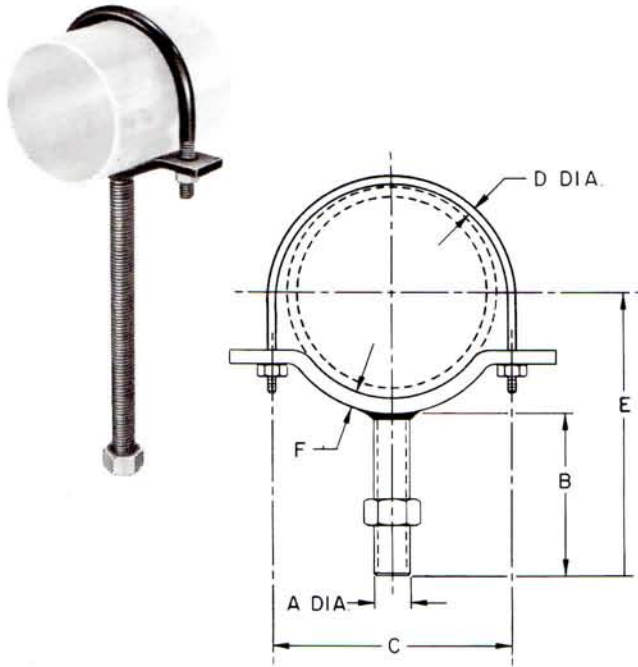
#### weights • dimensions (inches)

nom pipe size	cable size or outside diam of conduit	wgt (approx) lbs each	diam of screw hole	size expansion case or screw anchor
¾	.67	.03	¼	3 <sup>1</sup> / <sub>16</sub> x 1
½	.84	.03	5 <sup>1</sup> / <sub>16</sub>	¼ x 1½
¾	1.05	.05	5 <sup>1</sup> / <sub>16</sub>	¼ x 1½
1	1.31	.09	5 <sup>1</sup> / <sub>16</sub>	¼ x 1½
1¼	1.66	.12	¾	¼ x 1½
1½	1.90	.16	7 <sup>1</sup> / <sub>16</sub>	¾ x 2
2	2.37	.25	7 <sup>1</sup> / <sub>16</sub>	¾ x 2
2½	2.87	.49	11 <sup>1</sup> / <sub>16</sub>	5 <sup>1</sup> / <sub>8</sub> x 3
3	3.50	.82	11 <sup>1</sup> / <sub>16</sub>	5 <sup>1</sup> / <sub>8</sub> x 3
4	4.50	1.3	¾	5 <sup>1</sup> / <sub>8</sub> x 3½

# Grinnell

## pipe supports

### adjustable pipe stanchion saddle w/ u-bolt fig. 191



**SIZE RANGE:** 2 through 12.

**MATERIAL:** Carbon steel.

**FINISH:** Black or galvanized.

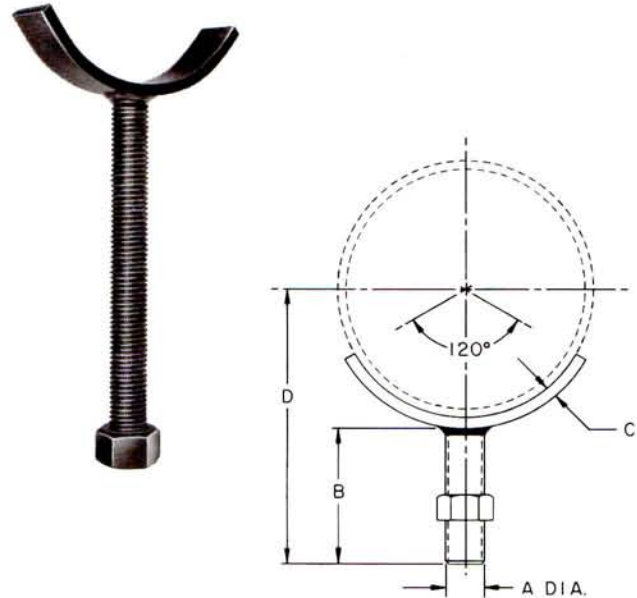
**SERVICE:** Stanchion type support where vertical adjustment is required, plus the additional stability provided by u-bolt attachment to pipe.

**ORDERING:** Specify pipe size to be supported, figure number, name.

#### weights • dimensions (inches)

pipe size	A	B	C	D	E	F	weight approx. lb. ea.
2	5/8	8	2 1/16	1/4	9 7/16	1/4 x 1	1.2
2 1/2	5/8	8	3 5/16	3/8	9 11/16	1/4 x 1	1.4
3	5/8	8	3 15/16	3/8	10	1/4 x 1	1.6
3 1/2	5/8	8	4 7/16	3/8	10 1/4	1/4 x 1	2.6
4	7/8	8	5 1/4	1/2	10 1/2	1/4 x 1 1/4	3.0
5	7/8	8	6 1/8	1/2	11	1/4 x 1 1/4	3.2
6	1	8	7 1/4	5/8	11 11/16	3/8 x 1 1/2	4.9
8	1	8	9 3/8	5/8	12 11/16	3/8 x 1 1/2	6.2
10	1 1/4	8	11 1/2	5/8	13 3/8	1/2 x 2	10.5
12	1 1/4	8	13 1/2	5/8	14 7/8	1/2 x 2	11.8

### adjustable pipe saddle support fig. 192



**SIZE RANGE:** 2 through 12.

**MATERIAL:** Carbon steel.

**FINISH:** Black or galvanized.

**SERVICE:** Stanchion type support where vertical adjustment is required.

**ORDERING:** Specify pipe size to be supported, figure number, name.

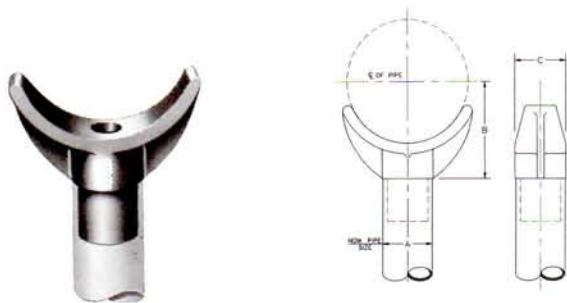
**MAXIMUM TEMPERATURE:** 650°F

#### weights • dimensions (inches)

pipe size	A	B	C	D	weight approx. lb. ea.
2	5/8	8	1/4 x 1	9 1/2	1.0
2 1/2	5/8	8	1/4 x 1	9 3/4	1.1
3	5/8	8	1/4 x 1	10 1/16	1.1
3 1/2	5/8	8	1/4 x 1	10 9/16	1.6
4	7/8	8	1/4 x 1 1/4	10 9/16	2.0
5	7/8	8	1/4 x 1 1/4	11 1/16	2.1
6	1	8	3/8 x 1 1/2	11 3/4	3.3
8	1	8	3/8 x 1 1/2	12 3/4	3.6
10	1 1/4	8	1/2 x 2	13 15/16	6.8
12	1 1/4	8	1/2 x 2	14 15/16	7.4

## pipe supports

**pipe saddle support  
fig. 258**



**SIZE RANGE:** 4 through 36 inch pipe.

**MATERIAL:** Cast iron saddle thru 12 inch, 14 inch thru 36 inch carbon steel saddle. 4 inch thru 12 inch steel saddle available on special request.

**FINISH:** Black or galvanized.

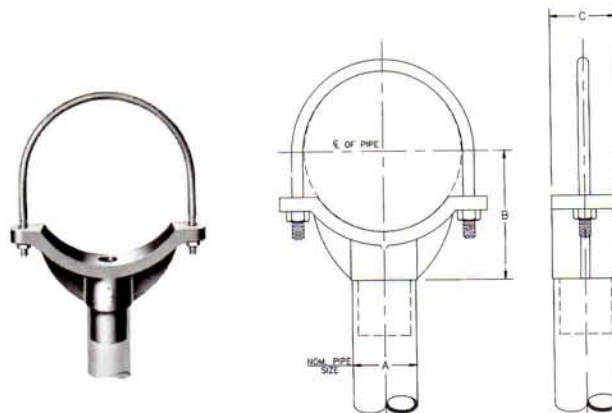
**APPROVALS:** Complies with Federal Specification WW-H-171E (Type 37) or when used with pipe and flange (Type 36) and Manufacturers Standardization Society SP-69 (Type 36) or when used with pipe and flange (Type 38).

**INSTALLATION:** Slip saddle base into riser pipe.

**ORDERING:** Specify pipe size to be supported, figure number, name and material.

pipe size	wgt (approx) lbs each	A	B	width C
4	9.1	3	4 <sup>3</sup> / <sub>16</sub>	3 <sup>5</sup> / <sub>8</sub>
5	10.8	3	4 <sup>13</sup> / <sub>16</sub>	3 <sup>5</sup> / <sub>8</sub>
6	11.8	3	5 <sup>7</sup> / <sub>16</sub>	3 <sup>5</sup> / <sub>8</sub>
8	14.3	3	6 <sup>15</sup> / <sub>16</sub>	3 <sup>5</sup> / <sub>8</sub>
10	19.3	3	8 <sup>7</sup> / <sub>16</sub>	3 <sup>5</sup> / <sub>8</sub>
12	23.1	3	9 <sup>15</sup> / <sub>16</sub>	3 <sup>5</sup> / <sub>8</sub>
14	15	3	10 <sup>1</sup> / <sub>2</sub>	4
16	16	3	11 <sup>1</sup> / <sub>2</sub>	4
18	23	4	13 <sup>1</sup> / <sub>2</sub>	5
20	24	4	14 <sup>1</sup> / <sub>2</sub>	5
22	26	4	15 <sup>1</sup> / <sub>2</sub>	5
24	30	4	17 <sup>1</sup> / <sub>2</sub>	5
26	32	4	18 <sup>1</sup> / <sub>2</sub>	5
30	41	4	20 <sup>5</sup> / <sub>8</sub>	5
32	42	4	21 <sup>5</sup> / <sub>8</sub>	5
36	46	4	23 <sup>5</sup> / <sub>8</sub>	8 <sup>3</sup> / <sub>4</sub>

**pipe stanchion saddle  
fig. 259**



**SIZE RANGE:** 4 through 36 inch pipe.

**MATERIAL:** Cast iron stanchion saddle with steel yoke and nuts. 14 thru 36 inch carbon steel saddle with steel yoke. 4 thru 12 inch steel saddles available on special request.

**FINISH:** Black or galvanized.

**APPROVALS:** Complies with Federal Specification WW-H-171E (Type 38) and Manufacturers Standardization Society SP-69 (Type 37).

**INSTALLATION:** Same as pipe saddle support fig. 258, except that yoke is attached to saddle after pipe is in place.

**FEATURES:** U-bolt yoke provides stability.

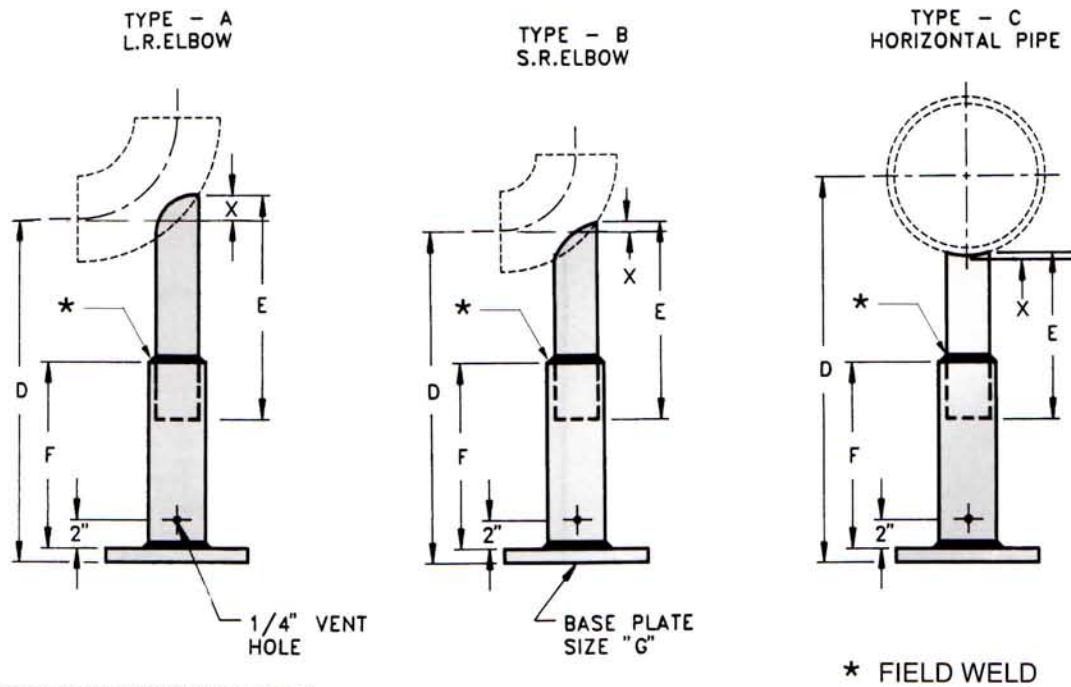
**ORDERING:** Specify pipe size to be supported, figure number, name and material.

**FINISH:** Black.

pipe size	wgt (approx) lbs each	A	B	width C
4	10.8	3	4 <sup>3</sup> / <sub>16</sub>	3 <sup>5</sup> / <sub>8</sub>
5	12.1	3	4 <sup>13</sup> / <sub>16</sub>	3 <sup>5</sup> / <sub>8</sub>
6	12.7	3	5 <sup>7</sup> / <sub>16</sub>	3 <sup>5</sup> / <sub>8</sub>
8	21.3	3	6 <sup>15</sup> / <sub>16</sub>	3 <sup>5</sup> / <sub>8</sub>
10	25.7	3	8 <sup>7</sup> / <sub>16</sub>	3 <sup>5</sup> / <sub>8</sub>
12	31.2	3	9 <sup>15</sup> / <sub>16</sub>	3 <sup>5</sup> / <sub>8</sub>
14	28	3	10 <sup>1</sup> / <sub>2</sub>	3 <sup>5</sup> / <sub>8</sub>
16	31	3	11 <sup>1</sup> / <sub>2</sub>	3 <sup>5</sup> / <sub>8</sub>
18	40	4	13 <sup>1</sup> / <sub>2</sub>	3 <sup>5</sup> / <sub>8</sub>
20	43	4	14 <sup>1</sup> / <sub>2</sub>	6
22	46	4	15 <sup>1</sup> / <sub>2</sub>	6
24	52	4	17 <sup>1</sup> / <sub>2</sub>	6
26	55	4	18 <sup>1</sup> / <sub>2</sub>	6
30	69	4	20 <sup>5</sup> / <sub>8</sub>	6
32	73	4	21 <sup>5</sup> / <sub>8</sub>	6
36	81	4	23 <sup>5</sup> / <sub>8</sub>	6

# Grinnell

## adjustable pipe stanchion fig. 62



### STANDARD X DIMENSION (inches)

NOM. PIPE OR ELL SIZE	TYPE-A				TYPE-B				TYPE-C			
	TOP STANCHION SCH. 40 NOM. PIPE SIZE				TOP STANCHION SCH. 40 NOM. PIPE SIZE				TOP STANCHION SCH. 40 NOM. PIPE SIZE			
	1½	2½	4	5	1½	2½	4	5	1½	2½	4	5
2	1 <sup>11</sup> / <sub>16</sub>				7/8				7/16			
2½	1 <sup>9</sup> / <sub>16</sub>				9/16				5/16			
3	1 <sup>7</sup> / <sub>16</sub>	2 <sup>9</sup> / <sub>16</sub>			3/8	1 <sup>5</sup> / <sub>16</sub>			1/4	3/4		
4	1 <sup>9</sup> / <sub>16</sub>	2 <sup>7</sup> / <sub>16</sub>			3/16	1 <sup>5</sup> / <sub>16</sub>			1/4	9/16		
5		2 <sup>7</sup> / <sub>16</sub>	4¼		5/8	2 <sup>3</sup> / <sub>16</sub>			7/16	1 <sup>3</sup> / <sub>16</sub>		
6		2½	4	5 <sup>7</sup> / <sub>16</sub>	7/16	1 <sup>11</sup> / <sub>16</sub>	2 <sup>7</sup> / <sub>8</sub>		5/16	7/8	1½	
8			4 <sup>1</sup> / <sub>16</sub>	5 <sup>3</sup> / <sub>8</sub>		1 <sup>3</sup> / <sub>16</sub>	2 <sup>1</sup> / <sub>16</sub>			1 <sup>1</sup> / <sub>16</sub>	1	
10			4 <sup>3</sup> / <sub>16</sub>	5 <sup>1</sup> / <sub>16</sub>		¾	1 <sup>7</sup> / <sub>16</sub>			½	¾	
12				5¼			1 <sup>1</sup> / <sub>16</sub>			½	5/8	
14				6¼			1 <sup>3</sup> / <sub>8</sub>				9/16	
16				6½			1 <sup>7</sup> / <sub>16</sub>				½	
18				6¾			1 <sup>11</sup> / <sub>16</sub>				7/16	

E = 6" + X Dim. (All Types)

F = D - Base Plate Thickness - 3" (Types A&B)

F = D - Base Plate Thickness - ½ Pipe O.D. - 3" (Type C)

### DIMENSIONS (inches)

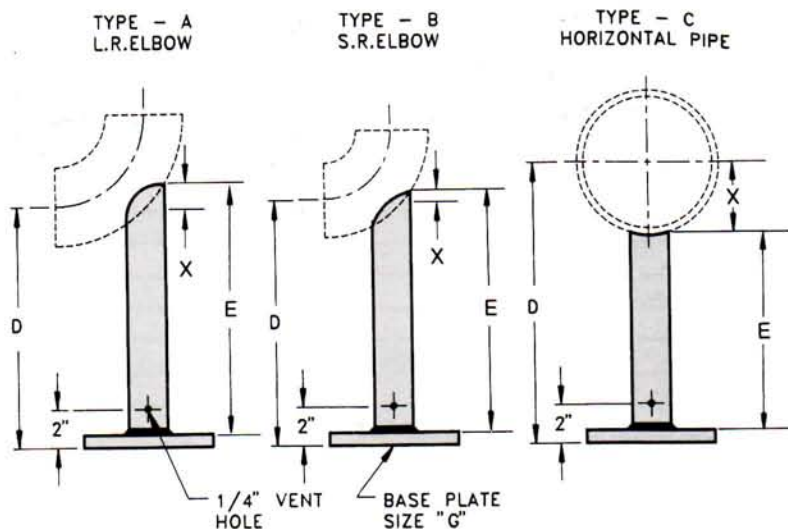
COMBINATION NO.	1	2	3	4
TOP STANCHION SIZE-E	1½ SCH. 40	2½ SCH. 40	4 SCH. 40	5 SCH. 40
BOTTOM STANCHION SIZE-F	2 SCH. 40	3 SCH. 40	5 SCH. 80	6 SCH. 80
BASE Plate SIZE-G	¾ x 6 x 6	¾ x 10 x 10	¾ x 10 x 10	¾ x 10 x 10

### TO ORDER SPECIFY:

- (1) **Complete:** Fig. 62 Adj. Pipe Stanchion, (Type), (Comb. No.), (Mat'l. Spec.), (Pipe or Ell Size), (E, F),
- (2) **Complete - Top Portion Alloy, Bottom Portion C.S.:** Fig. 62 Adj. Pipe Stanchion, (Type), (Comb. No.), (Top Mat'l. Spec.), (Bottom Mat'l. Spec.), (Pipe or Ell Size), (E, F, G Dim.),
- (3) **Top Portion only:** Fig. 62 Adj. Pipe Stanchion Top Portion only, (Type), (Comb. No.), (Mat'l. Spec.), (Pipe or Ell Size), (E Dim.),
- (4) **Bottom Portion w/Base Plate:** Fig. 62 Adj. Pipe Stanchion Bottom Portion only, (Comb. No.), (Mat'l. Spec.), (F, G Dim.),



## pipe stanchion fig. 63



### BASE PLATE DIMENSIONS (inches)

STANCHION NOMINAL PIPE SIZE	G
2	3/8 x 6 x 6
3	3/8 x 8 x 8
4	3/8 x 8 x 8
5	3/8 x 10 x 10
6	3/8 x 10 x 10
8	3/8 x 14 x 14
10	1/2 x 18 x 18
12	1/2 x 18 x 18
14	1/2 x 20 x 20
16	1/2 x 22 x 22
20	1/2 x 24 x 24
24	1/2 x 30 x 30

### TO ORDER SPECIFY:

Fig. 63 Pipe Stanchion, (Type), (Material Spec.), (Stanchion Size) for (Pipe or Elbow Size), (D, Dimensions).

### STANDARD X DIMENSION (inches)

### TYPE A

Nom. Pipe or ELL Size	Stanchion - Standard Weight Pipe Nominal Size													
	1 1/2	2	2 1/2	3	4	5	6	8	10	12	14	16	20	24
2 1/2	1 7/16	2 3/16												
3	1 7/16	1 15/16	2 9/16											
4	1 9/16	1 15/16	2 7/16	3 3/16										
5	1 9/16	2	2 7/16	3	4 1/4									
6			2 1/2	3	4	5 7/16								
8				3 1/4	4 1/16	5 1/16	6 3/8							
10					4 3/16	5 1/16	6 1/16	8 7/16						
12						5 1/4	6 3/16	8 3/16	11 1/16					
14						6 1/4	7 1/8	9	11 5/8	15 1/16				
16						6 1/2	7 9/16	9 1/16	11 5/16	13 15/16	13 1/16			
18							7 5/8	9 1/4	11 1/4	13 1/2	13 3/16	18 9/16		
20								9 7/16	11 5/16	13 3/8	14 13/16	17 1/2		
22								9 11/16	11 7/16	13 3/8	14 11/16	17	23 3/8	
24								9 15/16	11 5/8	13 7/16	14 3/16	16 13/16	22 1/4	
26									11 15/16	13 5/8	14 3/4	16 3/4	21 5/8	
28									12 1/8	13 13/16	14 7/8	16 3/4	21 1/4	27 3/16
30										14	15	16 7/8	21	26 1/4
32										14 1/4	15 1/4	17	20 15/16	25 3/4
34										14 1/2	15 1/2	17 3/16	20 15/16	25 7/16
36										14 13/16	15 3/4	17 7/16	21	25 1/4
42											16 9/16	18 1/8	21 1/2	25 3/16

## pipe stanchion fig. 63

### STANDARD X DIMENSION (inches)

### TYPE B

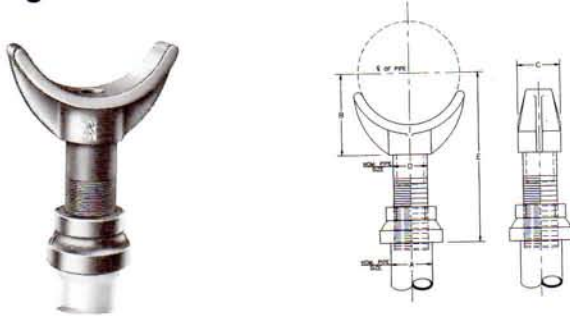
Nom. Pipe or ELL Size	Stanchion - Standard Weight Pipe Nominal Size													
	1½	2	2½	3	4	5	6	8	10	12	14	16	20	24
2½	9/16	1½												
3	3/8	3/4	15/16											
4	3/16	½	15/16	19/16										
5	1/16	5/16	5/8	1½	23/16									
6			7/16	7/8	111/16	27/8								
8			¼	½	13/16	21/16	3/8							
10					¾	17/16	25/16	43/8						
12						17/16	17/8	37/8	6					
14						13/8	21/8	33/4	515/16	815/16				
16						11/16	13/4	31/4	51/16	73/16	91/8			
18							17/16	23/4	41/2	67/16	713/16	103/4		
20								27/16	4	511/16	615/16	91/4		
22								21/16	39/16	53/16	61/4	81/4	1315/16	
24								13/4	33/16	411/16	511/16	71/2	123/16	
26									27/8	41/4	51/4	67/8	11	
28									21/2	37/8	43/4	63/8	101/8	153/16
30										31/2	43/8	57/8	93/8	1313/16
32										33/16	4	51/2	83/4	1213/16
34										213/16	311/16	51/16	83/16	1115/16
36										21/2	35/16	33/4	73/4	111/4
42 (Radius = 42)											27/16	311/16	67/16	99/16
42 (Radius = 48)											65/16	711/16	105/8	1315/16

### STANDARD X DIMENSION (inches)

### TYPE C

Nom. Pipe or ELL Size	Stanchion - Standard Weight Pipe Nominal Size													
	1½	2	2½	3	4	5	6	8	10	12	14	16	20	24
2½	11/16	13/16												
3	17/16	15/16	1¼											
4	21/8	17/8	13/4	13/8										
5	25/8	21/2	23/8	23/16	15/8									
6			3	213/16	27/16	113/16								
8				315/16	35/8	33/16	23/4							
10					47/8	45/8	41/4	31/4						
12					57/8	53/4	57/16	411/16	37/16					
14						67/16	63/16	51/2	47/16	27/8				
16						71/2	71/4	63/4	515/16	413/16	37/8			
18							85/16	77/8	71/4	63/8	55/8	41/8		
20								9	87/16	711/16	71/8	6		
22								103/16	99/16	815/16	81/2	79/16	49/16	
24								113/16	103/4	101/8	93/4	815/16	65/8	
26									1113/16	115/16	1015/16	101/4	85/16	
28									1215/16	125/8	121/8	111/2	913/16	71/4
30										139/16	131/4	1211/16	111/16	9
32										145/8	143/8	1313/16	121/2	109/16
34										153/4	151/2	15	133/4	121/16
36										1613/16	169/16	161/8	15	137/16
42											1913/16	197/16	181/2	171/4

## adjustable pipe saddle support fig. 264



**SIZE RANGE:** 2½ through 36 inch pipe.

**MATERIAL:** Cast iron saddle, locknut nipple and special cast iron reducer, ♦ assembled.

**FINISH:** Black or galvanized.

**SERVICES:** Stanchion type support where vertical adjustment of steel pipe is required.

**APPROVALS:** Complies with Federal Specification WW-H-171E (Type 39) and Manufacturers Standardization Society SP-69 (Type 38).

**INSTALLATION:** Adjustment is obtained by turning the locknut nipple. The lower end of the nipple is staked, upsetting the threads to prevent separation of nipple and coupling during adjustment.

### FEATURES:

- Vertical adjustment of approximately 4½ inches.
- Saddle supports a broad range of pipe sizes.

**ORDERING:** Specify pipe size to be supported, figure number, name.

**FINISH:** Black.

### weights • dimensions (inches)

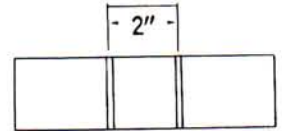
pipe size	wgt (approx) lbs each		A	B	D	E		width C
	complete	saddle only				min	max	
2½	9.0	4.8	2½	3½	1½	8	13	3
3	9.2	5.0	2½	3¾	1½	8¼	13¼	3
3½	9.4	5.2	2½	4	1½	8½	13½	3
4	15.0	7.6	3	4¼	2½	9¼	14	3½
5	16.7	8.3	3	4⅞	2½	10	14¾	3½
6	17.7	10.3	3	5½	2½	10½	15¼	3½
8	20.2	12.8	3	6⅞	2½	11¾	16½	3½
10	25.2	17.8	3	8½	2½	13½	18¼	3½
12	29.0	21.6	3	9½	2½	15	19¾	3½
14	40.2	38.0	4	10½	3	16¼	20¾	4½
16	53.2	42.0	4	12¾	3	17¾	22¼	4½
18	70.8	51.0	6	13⅞	3½	19½	24	4½
20	104.8	85.0	6	15¾	3½	21	25½	6¾
24	137.0	110.0	6	17½	4	23¾	28¼	6¾
30	170.0	150.0	6	21½	4	27	31½	6¾
32	181.0	161.1	6	22½	4	28¼	32¾	8¾
36	249.0	229.0	6	24½	4	30¼	34¾	8¾

♦ The special cast iron reducer may be furnished with a hex-shaped smaller end.

## shield

## pipe supports

### rib-lok shield fig. 168



**SIZE RANGE:** For use with ½ through 6 inch pipe with insulation thickness of ½, ¾, 1, 1½, or 2 inches.

**MATERIAL:** Carbon steel.

**FINISH:** Galvanized.

**SERVICE:** To be used with fig. 65 or fig. 260 clevis. Designed to prevent damage to insulation by hanger. Ribs keep shield centered on hanger.

**HOW TO SIZE:** Refer to shield size selection table below.

**ORDERING:** Specify size, figure number, name.

shield size #	max O.D. of insulation	stock sizes	weight (approx) lb each
1	2¾	18 ga. x 8	.44
2	2⅞	18 ga. x 8	.52
3	3½	18 ga. x 8	.63
4	4	18 ga. x 8	.71
5	4½	18 ga. x 8	.81
6	5	18 ga. x 8	.90
7	5½	18 ga. x 8	1.01
8	6½	18 ga. x 8	1.20
9	7½	18 ga. x 12	2.04
10	8½	18 ga. x 12	2.29
11	9½	18 ga. x 12	2.20
12	10¾	18 ga. x 12	2.86
13	11¾	18 ga. x 12	3.2
14	12¾	18 ga. x 12	3.5

### shield size selection table

pipe size	insulation thickness (inches)				
	½	¾	1	1½	2
½	1	1	...	...	...
¾	1	1	2	4	6
1	1	2	3	5	7
1¼	2	3	3	6	7
1½	2	3	4	6	7
2	3	4	5	7	8
2½	4	5	6	7	8
3	5	6	7	8	9
3½	...	...	8	9	10
4	...	...	8	9	10
5	...	...	9	10	11
6	...	...	10	11	12
8	...	...	12	13	14

For sizes of fig. 65 or fig. 260 clevis for use with shields outside of insulation use table for fig. 167 on page ph-80.

## insulation shield

### insulation protection shield fig. 167



**SIZE RANGE:** For use with 1/2" through 24" pipe with insulation thicknesses of 1/2", 3/4", 1", 1 1/2" and 2".

**MATERIAL:** Carbon steel.

**FINISH:** Galvanized.

**SERVICE:** Recommended for outside of foam or fiber glass insulation to preclude crushing of insulation without breaking the vapor barrier.

**APPROVALS:** Complies with Federal Specification WW-H-171E (Type 41) and Manufacturers Standardization Society SP-69 (Type 40).

**HOW TO SIZE:** Refer to "Shield Size Selection Table" below.

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

#### shield size selection table

pipe size	insulation thickness (inches)				
	1/2	3/4	1	1 1/2	2
1/2	1A■	1A	...	...	...
3/4	1A	2A	3A	4A	6A
1	1A	2A	3A	5A	7A
1 1/4	2A	3A	4A	6A	7A
1 1/2	2A	3A	4A	6A	8A
2	3A	4A	5A	7A	8A
2 1/2	4A	5A	6A	8A	9A
3	5A	6A	7A	8A	9A
3 1/2	...	...	8A	9A	10A
4	...	...	8A	9A	10A
5	...	...	9B	10B	11B
6	...	...	10B	11B	12B
8	...	...	12B	13C	14C
10	...	...	14C	15C	16C
12	...	...	16C	17C	18C
14	...	...	17C	18C	19C
16	...	...	19C	20C	21C
18	...	...	21C	22C	23C
20	...	...	23C	24C	25C
24	...	...	26C	27C	28C

■ For unarco foam specify X1A.

#### weights • dimensions (inches)

shield size	wgt (approx) lbs each	stock size	shield length	R
X1A	.54	18 Ga.	12	.95
1A	.69	18 Ga.	12	1.19
2A	.84	18 Ga.	12	1.44
3A	.99	18 Ga.	12	1.75
4A	1.1	18 Ga.	12	2.00
5A	1.3	18 Ga.	12	2.25
6A	1.4	18 Ga.	12	2.50
7A	1.6	18 Ga.	12	2.78
8A	1.9	16 Ga.	12	3.32
9A	2.7	16 Ga.	12	3.82
10A	3.1	16 Ga.	12	4.32
9B	4.0	16 Ga.	18	3.82
10B	4.6	16 Ga.	18	4.32
11B	5.1	16 Ga.	18	4.82
12B	5.6	16 Ga.	18	5.38
13C	10.2	14 Ga.	24	5.88
14C	11.1	14 Ga.	24	6.38
15C	12.3	14 Ga.	24	7.00
16C	12.7	14 Ga.	24	7.50
17C	13.6	14 Ga.	24	8.00
18C	14.5	14 Ga.	24	8.50
19C	21.2	12 Ga.	24	9.00
20C	22.4	12 Ga.	24	9.50
21C	23.6	12 Ga.	24	10.00
22C	24.8	12 Ga.	24	10.50
23C	25.9	12 Ga.	24	11.00
24C	27.1	12 Ga.	24	11.50
25C	28.3	12 Ga.	24	12.00
26C	31.0	12 Ga.	24	13.00
27C	31.8	12 Ga.	24	13.50
28C	33.0	12 Ga.	24	14.00

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

#### sizes of fig. 65 or fig. 260 clevis for use with shields outside of insulation

pipe size	insulation thickness (inches)				
	1/2	3/4	1	1 1/2	2
1/2	2	2	...	...	...
3/4	2	2 1/2	3	3 1/2	5
1	2	2 1/2	3	4	5
1 1/4	2 1/2	3	3 1/2	5	5
1 1/2	2 1/2	3	3 1/2	5	6
2	3	3 1/2	4	5	6
2 1/2	3 1/2	4	5	6	8
3	4	5	5	6	8
3 1/2	...	...	6	8	8
4	...	...	6	8	8
5	...	...	8	8	10
6	...	...	8	10	10
8	...	...	10	12	12
10	...	...	12	14	16
12	...	...	16	16	18
14	...	...	16	18	18
16	...	...	18	20	20
18	...	...	20	...	...
20	...	...	...	24	24
24	...	...	...	...	...

## protection saddles

### pipe covering protection saddle

for nominal thickness of covering:

1 inch: fig. 160

1½ inch: fig. 161

2 inch: fig. 162

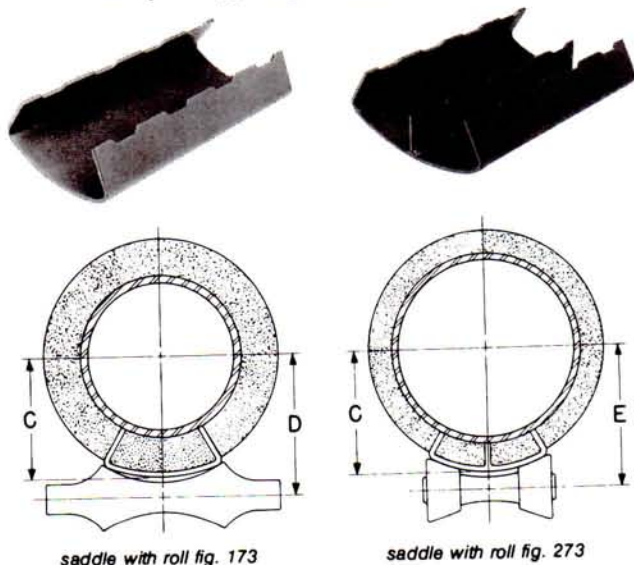
2½ inch: fig. 163

3 inch: fig. 164

4 inch: fig. 165

4 inch (Alloy): fig. 165A

5½ inch (Alloy): fig. 166A



**SIZE RANGE:** For use with ¾ to 36 inch pipe.

**MATERIAL:** Figs. 160, 161, 162, 163, 164 and 165 are curved carbon steel plate. Figs. 165A and 166A are alloy steel manufactured from ASTM A-387 Grade 22 Chrome Molybdenum steel plate. Figs. 165A and 166A have a welded-in center plate in all sizes. All other saddles have a welded-in center plate for pipe sizes 12 inch and larger. All saddles are 12 inches long with side edges turned up.

**SERVICE:** Designed for high temperature service or where heat losses are to be kept at a minimum and to protect insulation against damage.

**MAXIMUM TEMPERATURE:** 650°F Carbon Steel, 950°F Alloy Steel.

**APPROVALS:** Complies with Federal Specification WW-H-171E (Type 40A or Type 40B) and Manufacturers Standardization Society SP-69 (Type 39A or Type 39B).

**FEATURES:** Permits finished, weathertight covering at all points of pipe support.

**ORDERING:** Specify pipe size, figure number, name. Data for 42 inch size available on request.

**FINISH:** Black.

### loads • weights • dimensions (inches)

pipe size	fig. no.	max recom load, lbs	wgt (approx) lbs each	actual thickness of covering	size of pipe roll			center line of pipe to outside of saddle C	center line of pipe to center line of roll		
					figs. 171, 175 177	figs. 174, 181	figs. 271-277		D		E
									figs. 171, 175 177	figs. 174, 181	
¾	160*	1200	1.4	7/8	2	2½	2-3½	1½	2¹/₁₆	2½	2¼
	161*	1200	2.1	17/₁₆	3	3½	2-3½	2³/₁₆	2¾	2¾	27/8
	162*	1200	2.8	17/8	4	5	2-3½	2¹¹/₁₆	3⁵/₁₆	3⁵/₁₆	3¾
1	160*	1200	1.4	1¹/₁₆	2½	3	2-3½	1¹³/₁₆	2⁵/₁₆	2¼	27/₁₆
	161*	1200	2.1	19/₁₆	3	4	2-3½	2⁵/₁₆	27/8	27/8	3
	162*	1200	2.8	2½	4	5	2-3½	27/8	3½	3½	3½
1¼	160	1200	1.4	7/8	2½	3	2-3½	1¹⁵/₁₆	2½	27/₁₆	29/₁₆
	161*	1200	2.1	1¾	3½	5	2-3½	29/₁₆	3¹/₁₆	3¹/₁₆	3³/₁₆
	162*	1200	2.8	1¹⁵/₁₆	4	5	2-3½	3	3¾	3¾	3¹¹/₁₆
163*	1200	3.6	27/₁₆	5	6	4-6	3¾	4¾	4¾	4¾	
	160	1200	1.5	1	3	3½	2-3½	2½	2½	2½	2¹¹/₁₆
	161*	1200	2.1	1½	3½	5	2-3½	2½	3¼	3¼	3⁵/₁₆
1½	162*	1800	3.2	2⁵/₁₆	5	6	4-6	3⁵/₁₆	4	4	37/8
	163*	1800	3.6	2¹³/₁₆	6	8	4-6	37/8	4½	4½	4½
	160	1200	1.7	1¹/₁₆	3½	4	2-3½	2¾	3	2¹⁵/₁₆	3¹/₁₆
2	161*	1200	2.3	19/₁₆	4	5	2-3½	27/8	3½	3½	39/₁₆
	162*	1800	3.2	2½	5	6	4-6	39/₁₆	4¼	4¼	43/₁₆
	163*	1800	3.6	2¾	6	8	4-6	4¹/₁₆	4¾	4¹³/₁₆	4¾
164*	1800	4.5	3¾	8	8	4-6	49/₁₆	5¾	5¾	5¼	

continued next page

■ Maximum recommended loads are applicable only when saddle is used on a flat bearing surface and tack welded to pipe. When saddle is used with a pipe roll, the maximum load for the assembly is the smaller of the two loads.  
 • Saddles may require notching when used with a U-bolt.

# Grinnell

## protection saddle

loads • weights • dimensions (inches) (continued)

pipe size	fig. no.	max recom load, lb	wgt (approx) lbs each	actual thickness of covering	size of pipe roll			center line of pipe to outside of saddle, C	center line of pipe to center line of roll		
					figs. 171, 175 177	figs. 174, 181	figs. 271-277		D		E
									figs. 171, 175 177	figs. 174, 181	
2 1/2	160	1200	1.7	1 1/16	3 1/2	5	2- 3 1/2	2 1/16	3 1/4	3 1/4	3 5/16
	161•	1200	2.8	1 7/8	5	6	4- 6	3 5/16	4	4	3 15/16
	162•	1200	3.2	2 5/16	6	8	4- 6	3 7/8	4 1/2	4 5/8	4 1/2
	163•	1200	4.1	2 7/8	8	8	4- 6	4 1/4	5 1/8	5 1/8	5
	164•	1200	4.5	3 3/8	8	10	4- 6	4 7/8	5 5/8	5 3/4	5 1/2
3	160	1200	1.9	1	4	5	2- 3 1/2	2 5/16	3 1/2	3 1/2	3 9/16
	161	1200	2.8	1 9/16	5	6	4- 6	3 5/8	4 5/16	4 5/16	4 1/4
	162•	1200	3.6	2 1/16	6	8	4- 6	4 1/8	4 13/16	4 13/16	4 11/16
	163•	1200	4.1	2 9/16	8	8	4- 6	4 1 1/16	5 7/16	5 7/16	5 5/16
	164•	1200	4.9	3 1/16	8	10	8-10	5 1/16	6	6	6 1/16
3 1/2	160	1200	2.3	1 1/4	5	6	4- 6	3 5/16	4	4	3 5/16
	161	1200	3.2	1 13/16	6	8	4- 6	3 1 1/16	4 9/16	4 9/16	4 1/2
	162•	1200	3.6	2 1/4	8	8	4- 6	4 5/16	5 1/8	5 1/8	5
	163•	1200	4.5	2 3/4	8	10	8-10	4 1 1/16	5 5/8	5 5/8	5 1 1/16
	164•	1200	4.9	3 5/16	10	10	8-10	5 3/8	6 5/16	6 5/16	6 3/8
4	160	1200	2.3	1 1/16	5	6	4- 6	3 9/16	4 1/4	4 1/4	4 3/16
	161	1200	3.2	1 9/16	6	8	4- 6	4 1/16	4 7/8	4 7/8	4 3/4
	162	1200	3.6	2 1/16	8	8	4- 6	4 9/16	5 3/8	5 3/8	5 1/4
	163	1200	4.5	2 9/16	8	10	8-10	5	5 15/16	5 15/16	6
	164•	1200	4.9	3 1/16	10	10	8-10	5 5/8	6 9/16	6 9/16	6 5/8
	165•	1200	6.1	4 1/16	10	12	12-14	6 1/2	7 5/8	7 5/8	7 9/16
	165A•	7200	11.6	4 1/16	10	12	12-14	6 1/2	7 5/8	7 5/8	7 9/16
	166A•	7200	15.7	5 1 1/16	14	16	12-14	8 1/8	9 5/8	9 1/2	9 5/16
5	160	1200	2.3	1	6	8	4- 6	4 1/8	4 13/16	4 13/16	4 3/4
	161	1200	3.2	1 1/2	8	8	4- 6	4 1 1/16	5 1/2	5 1/2	5 3/8
	162	1200	3.6	2	8	10	8-10	5 3/16	6	6 1/16	6 1/8
	163	1200	4.5	2 9/16	10	10	8-10	5 5/8	6 9/16	6 9/16	6 5/8
	164	1200	4.9	3 1/16	10	12	8-10	6 3/16	7 1/8	7 1/4	7 1/4
	165•	1200	6.1	4 3/16	12	14	12-14	7 1/8	8 3/16	8 3/8	8 3 1/16
	165A•	7200	11.6	4 3/16	12	14	12-14	7 1/8	8 1/8	8 3/8	8 3 1/16
	166A•	7200	15.7	5 1 1/16	16	16	12-14	8 1 1/16	10 1 1/16	10 1 1/16	9 7/8
6	160	1800	3.8	1	8	8	4- 6	4 1/2	5 3/8	5 3/8	5 1/4
	161	1800	4.4	1 1/2	8	10	8-10	5 1/16	5 7/8	5 1 1/16	6
	162	1800	5.7	2	10	10	8-10	5 1/2	6 7/16	6 7/16	6 1/2
	163	1800	6.5	2 1/2	10	12	8-10	6 3/16	7 1/8	7 3/16	7 1/4
	164	1800	7.7	3	12	12	8-10	6 9/16	7 5/8	7 5/8	7 5/8
	165•	1800	10.2	4 1/8	14	16	12-14	7 9/16	9	9	8 3/4
	165A•	7200	12.9	4 1/8	14	16	12-14	7 5/8	9 1/8	9	8 13/16
166A•	7200	16.3	5 5/8	16	18	16-20	9 1/8	10 5/8	10 9/16	10 7/16	
8	161	1800	5.8	1 1/2	10	12	8-10	6	7 1/16	7 1/16	7 1/16
	162	1800	6.3	2	10	12	8-10	6 1/2	7 9/16	7 9/16	7 9/16
	163	1800	7.2	2 1 1/16	12	14	8-10	7 1/4	8 5/16	8 1/2	8 5/16
	164	1800	7.7	3 3/8	14	16	12-14	7 1 1/16	9	9	8 3/4
	165	1800	10.2	4 3/16	16	18	16-20	8 1 1/16	10 1/8	10 1/8	9 7/8
	165A	7200	16.9	4 3/16	16	18	16-20	8 1 1/16	10 1 1/16	10 1/8	9 7/8
166A•	7200	22.6	5 5/8	18	20	16-20	10 1/4	11 7/8	11 13/16	11 5/8	
10	161	1800	5.8	1 9/16	12	14	8-10	7 1/4	8 5/16	8 1/2	8 5/16
	162	1800	7.7	2 1/16	14	16	12-14	7 5/8	9 1/16	9	8 13/16
	163	1800	8.2	2 9/16	14	16	12-14	8 1/8	9 9/16	9 9/16	9 5/16
	164	1800	8.8	3 1/16	16	18	16-20	8 1 1/16	10 1/8	10 1/16	10
	165	1800	10.8	4 1/16	18	20	16-20	9 3/4	11 1/4	11 1/4	11 1/8
	165A	7200	18.9	4 1/16	18	20	16-20	9 1 1/16	11 5/16	11 1/4	11 1/8
166A•	7200	24.3	5 9/16	20	...	22-24	11 1/8	12 5/16	...	12 1/2	

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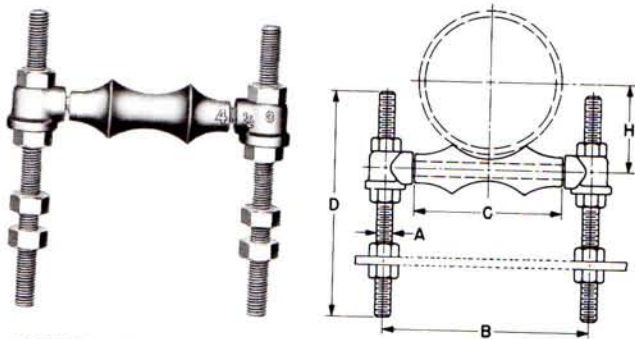
■ Maximum recommended loads are applicable only when saddle is used on a flat bearing surface and tack welded to pipe. When saddle is used with a pipe roll, the maximum load for the assembly is the smaller of the two loads.

• Saddles may require notching when used with a U-bolt.



## pipe rolls

### adjustable pipe roll support fig. 177



**FINISH:** Black.

**SIZE RANGE:** 1 through 30 inch.

**MATERIAL:** Cast iron roll and sockets, steel roll rod, continuous thread rods and hex nuts.

**SERVICE:** For support of pipe where horizontal movement due to expansion and contraction will occur and where vertical adjustment up to 6 inches may be necessary.

**INSTALLATION:** Normally used directly above steel beams, brackets, angles, etc.

**MAXIMUM TEMPERATURE:** 450°F at roller.

#### HOW TO SIZE:

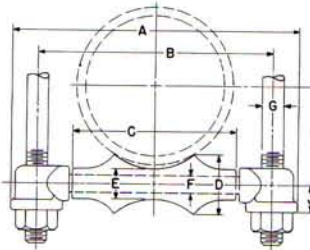
- (1) If roll is to support bare pipe, select the size directly from nominal pipe size (see below).
- (2) If used with pipe covering protection saddle, see pages ph-74, 75, 76 for size of pipe roll.
- (3) If roll is to support covered pipe, the O.D. of the covering should not be greater than the O.D. of the pipe for which the roll was designed.

**ORDERING:** Specify size of roll, figure number, name. Be certain to order oversized rolls where insulation makes this necessary.

#### weights • dimensions (inches)

pipe size	weight (approx) lbs each	A	B	C	D	H
1	1.1	3/8	3	1 1/2	12	1 1/16
1 1/4	1.2	3/8	3 3/8	1 7/8	12	1 1/4
1 1/2	1.2	3/8	3 5/8	2 1/8	12	1 3/8
2	1.3	3/8	4 1/8	2 5/8	12	1 5/8
2 1/2	2.3	1/2	4 7/8	3 3/8	12	1 15/16
3	2.4	1/2	5 1/2	3 3/4	12	2 1/4
3 1/2	2.7	1/2	6 1/8	4 1/4	12	2 9/16
4	3.8	3/4	6 3/4	4 3/4	12	2 13/16
5	4.7	3/4	8 1/16	5 13/16	12	3 7/16
6	7.6	3/4	9 9/16	6 7/8	12	4
8	11.0	3/4	11 15/16	8 7/8	12	5 1/8
10	13.7	3/4	14 1/16	11	12	6 3/8
12	19.4	3/4	15 13/16	12 1/2	12	7 7/16
14	31.2	1	17 3/4	14 1/4	12	8 3/8
16	42.5	1	19 3/4	16 1/4	18	9 7/16
18	46.6	1	21 7/8	18 1/4	18	10 1/2
20	66.2	1 1/4	24 1/4	20 1/4	18	11 5/8
24	102.5	1 1/2	28 5/8	24 1/4	24	14
30	186.8	1 1/2	35 1/2	30 1/4	24	17 7/16

### single pipe roll pipe roll complete: fig. 171 pipe roll only: fig. 173 adjustable socket only: fig. 171A



**FINISH:** Black or galvanized.

**MATERIAL:** Cast iron roll and sockets, steel roll rod.

**SERVICE:** For suspension of pipe from two rods where longitudinal movement due to expansion and contraction may occur.

**APPROVALS:** Complies with Federal Specification WW-H-171E (Type 42) and Manufacturers Standardization Society SP-69 (Type 41).

**ADJUSTMENT:** Adjustable socket permits vertical adjustment at the roll.

**MAXIMUM TEMPERATURE:** 450°F at roller.

#### HOW TO SIZE:

- (1) If the roll is to support non-insulated pipe, select the size directly from nominal pipe size (column 1) in table on page ph-78.
- (2) If used with pipe covering protection saddle, see pages ph-74, 75, 76 for size of pipe roll.

#### FEATURES:

- Provides for vertical adjustment; nut at bottom of hanger rod fits into the socket preventing loosening or turning due to vibration.
- Pipe roll is made hollow and has small surface contact with pipe or saddle.

#### ORDERING:

- (1) To order fig. 171 pipe roll complete, specify: pipe roll size.
- (2) To order fig. 173 pipe roll only, specify: pipe roll size.
- (3) To order fig. 171A adjustable socket only, specify: socket size.
- (4) Order should include figure number and name in all cases. Hanger rods and nuts to be ordered separately.
- (5) Be certain to order oversized rolls where insulation makes this necessary.

*(continued on next page)*



### single pipe roll: dimensions (inches) • loads • weights

nom pipe size	max O.D. covering	hanger rod size, G	adj socket no.	max recom safe load, lb	wgt (approx) lbs each			A	B	C	D	E	F	H	J
					fig. 171	fig. 173	fig. 171A								
1	2	3/8	1- 3/8	600	.45	.12	.13	4 1/8	3	1 1/2	1	3/4	3/8	1 1/16	9/16
1 1/4	2 1/2	3/8	1- 3/8	600	.48	.15	.13	4 1/2	3 3/8	1 7/8	1 1/16	3/4	3/8	1 1/4	9/16
1 1/2	2 3/4	3/8	1- 3/8	600	.51	.17	.13	4 3/4	3 5/8	2 1/8	1 1/8	3/4	3/8	1 3/8	9/16
2	3 1/4	3/8	1- 3/8	600	.57	.21	.13	5 1/4	4 1/8	2 5/8	1 3/16	3/4	3/8	1 5/8	9/16
2 1/2	3 3/4	1/2	2- 1/2	660	1.0	.35	.24	6 1/4	4 7/8	3 3/8	1 3/8	7/8	1/2	1 15/16	1 1/16
3	4 1/2	1/2	2- 1/2	700	1.1	.46	.24	6 7/8	5 1/2	3 3/4	1 7/16	7/8	1/2	2 1/4	1 1/16
3 1/2	5	1/2	2- 1/2	750	1.4	.51	.28	7 1/2	6 1/8	4 1/4	1 5/8	1	1/2	2 9/16	3/4
4	5 1/2	5/8	3- 1/2	750	1.7	.62	.35	8 1/4	6 3/4	4 3/4	1 3/4	1	1/2	2 13/16	3/4
5	7	5/8	3- 5/8	750	2.6	.96	.49	9 11/16	8 1/16	5 13/16	2	1 1/8	5/8	3 7/16	7/8
6	8 1/4	3/4	4- 3/4	1070	4.5	1.8	.77	11 7/16	9 9/16	6 7/8	2 5/16	1 1/4	3/4	4	1
8	10 1/2	3/4	5- 7/8	1350	7.2	2.9	1.2	14 1/16	11 15/16	8 7/8	2 13/16	1 1/2	7/8	5 5/8	1 1/8
10	12 3/4	7/8	5- 7/8	1730	9.5	4.8	1.2	16 3/16	14 1/16	11	3 3/8	1 3/4	7/8	6 3/8	1 1/8
12	14 3/4	7/8	5-1	2400	15.9	9.5	1.5	17 15/16	15 13/16	12 1/2	3 7/8	2	1	7 7/16	1 1/4
14	16 1/4	1	6-1 1/8	3130	24.3	15.4	2.1	20 7/8	17 3/4	14 1/4	4 5/8	2 1/2	1 1/8	8 3/8	1 3/8
16	18	1	6-1 1/4	3970	31.9	20.6	2.4	22 7/8	19 3/4	16 1/4	5	2 5/8	1 1/4	9 7/16	1 1/2
18	20 1/4	1	6-1 1/4	4200	35.5	22.8	2.8	24 1/2	21 7/8	18 1/4	5 7/16	2 3/4	1 1/4	10 1/2	1 1/2
20	22 1/2	1 1/4	8-1 1/4	4550	47.0	29.8	3.9	27 1/4	24 1/4	20 1/4	6	3	1 1/4	11 5/8	1 5/8
24	26 1/2	1 1/2	9-1 1/2	6160	76.3	52.3	5.3	32 5/8	28 5/8	24 1/4	7 3/16	3 5/8	1 1/2	14	1 3/4
30	32 1/2	1 1/2	9-1 1/4	7290	129.9	88.0	7.8	39	35 1/2	30 1/4	8 15/16	4 1/2	1 3/4	17 7/16	2 7/16

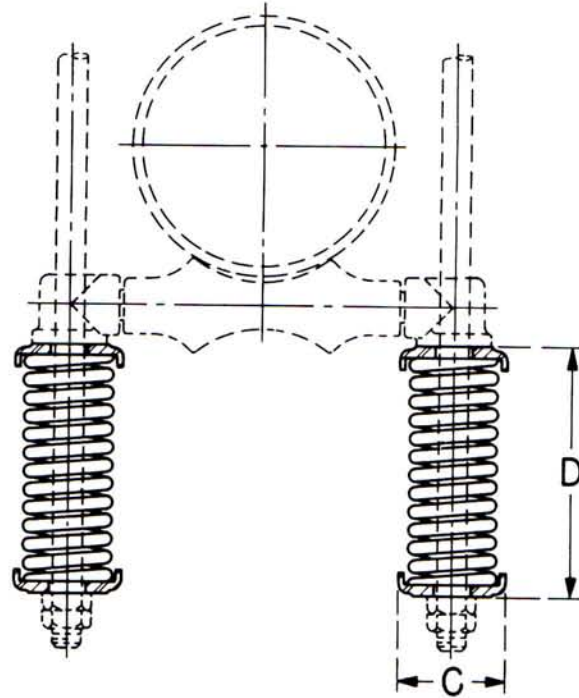
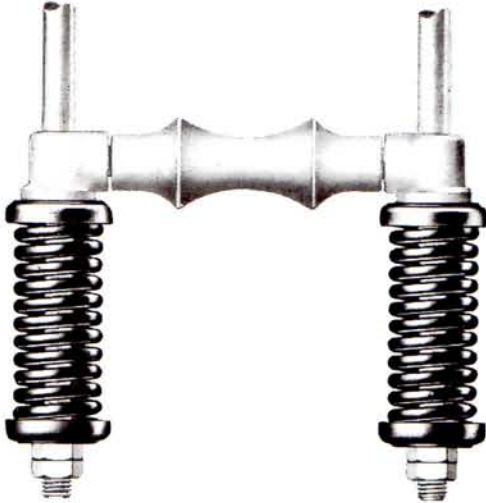
### ductile iron roll sizing

ductile iron pipe size	recommended fig. 171/173 roller size	ductile iron pipe size	recommended fig. 171/173 roller size
3	4	14	16
4	5	16	18
6	6	18	20
8	8	20	24
10	10	24	30
12	14	30	No Recommendation

# Grinnell

## spring

### spring cushion hanger fig. 178



**MATERIAL:** Spring cushion hanger fig. 178 consists of a set of two springs and four retainers only.

**SERVICE:** Generally used with fig. 171 single pipe roll as shown in above photo. Recommended for installations where the vertical movement does not exceed 1¼ inches.

**APPROVALS:** Complies with Federal Specification WW-H-171 E (Type 50) and Manufacturers Standardization Society SP-69 (Type 49).

**ORDERING:** Specify figure number, name, rod size. If used with fig. 171 single pipe roll, pipe roll must be ordered separately.

The retainers are cored to the dimensions as shown, but can be drilled or reamed larger to satisfy the hanger rod required.

### loads • weights • dimensions (inches)

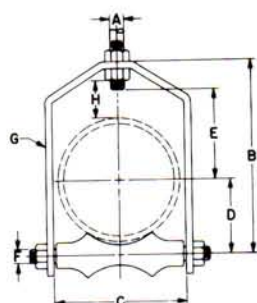
spring no.	max recom deflection ♦	load, lb at max recom deflection ■	deflection rate of hanger, lb per inch	weight (approx) lb, each	C	D	size of retainer core	for rod size	max* rod size
1	1¼	535	428	4.5	2 <sup>21</sup> / <sub>32</sub>	6 <sup>7</sup> / <sub>16</sub>	7/ <sub>16</sub>	¾	¾
2	1¼	1500	1200	14.0	4 <sup>1</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>16</sub>	9/ <sub>16</sub>	½	¾
3	1¼	3000	2400	22.0	4 <sup>1</sup> / <sub>8</sub>	9 <sup>1</sup> / <sub>16</sub>	15/ <sub>16</sub>	7/ <sub>8</sub>	1½

♦ At maximum recommended deflection, spring can be compressed on additional ¼ inch before becoming solid.

■ Maximum capacity of double spring hanger.

\* Can be drilled to max rod size.

**adjustable steel yoke pipe roll**  
fig. 181



**SIZE RANGE:** 2½ through 24 inch pipe.

**MATERIAL:** Cast iron roll; carbon steel yoke, roll rod and hex nuts.

**FINISH:** Black or galvanized.

**SERVICE:** For suspension of pipe from a single rod where horizontal movement may occur because of expansion or contraction.

**MAXIMUM TEMPERATURE:** 450°F at roller.

**APPROVALS:** Complies with Federal Specification WW-H-171E (Type 44) and Manufacturers Standardization Society SP-69 (Type 43).

**HOW TO SIZE:** If the roll is to support bare pipe, select the size directly from nominal pipe size (see below). If used with pipe covering protection saddle, see page ph-74, 75, 76 for size of pipe roll to be used.

**ORDERING:** Specify pipe roll size, figure number, name. Be certain to order oversized rolls where insulation makes this necessary.

**FINISH:** Black or galvanized.

**loads • weights**

pipe size	maximum O.D. of covering	max recom load, lb	wgt (approx) lbs each
2½	3	225	1.7
3	3½	310	2.2
3½	4½	390	2.5
4	4⅞	475	3.2
5	5¾	685	6.3
6	6¾	780	9.3
8	9	780	14.5
10	11	965	18.8
12	13	1200	27.7
14	14¾	1200	39.1
16	16¾	1200	49.1
18	18¾	1400	57.8
20	20¾	1600	75.9
24	24¾	1800	119.3

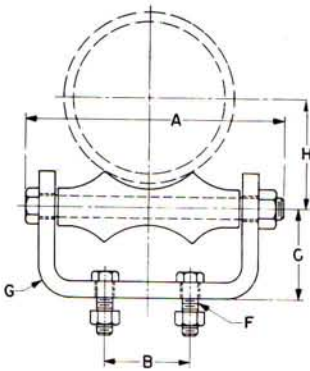
pipe size	rod take out							
	A	B	C	D	E	F	G	H
2½	½	5¼	¾	1⅞	2½	½	¾ x 1¼	1⅞
3	½	6¾	¾	2¼	3½	½	¾ x 1¼	1¾
3½	½	7	4¾	2⅞	3½	½	¼ x 1¼	1⅞
4	¾	7⅞	4⅞	2⅞	3¾	½	¼ x 1½	1¾
5	¾	9¾	6	3⅞	4½	¾	¾ x 1¾	1⅞
6	¾	10⅞	7¾	4	5	¾	¾ x 2	1¾
8	¾	12⅞	9¼	5½	6¾	¾	¾ x 2½	2
10	¾	15⅞	11¼	6¾	7¼	¾	¾ x 2½	2⅞
12	¾	17⅞	13¼	7⅞	8¾	1	½ x 2½	2¼
14	1	18¾	14½	8¾	8¾	1½	½ x 2½	2
16	1	20⅞	16½	9¾	9⅞	1¼	½ x 2½	1⅞
18	1	23¾	18½	10⅞	11⅞	1¼	½ x 3	2⅞
20	1¼	26	20½	11¾	12¼	1¼	¾ x 3	2½
24	1½	32⅞	24¾	13⅞	15¾	1½	¾ x 3	4¾

# Grinnell

## pipe rolls

### roller chair

fig. 175



**SIZE RANGE:** 2 through 30 inch pipe.

**MATERIAL:** Cast iron roll, steel chair, roll rod, bolts and hex nuts.

**FINISH:** Black or galvanized.

**SERVICE:** For support of pipe where horizontal movement due to expansion and contraction will occur but where no vertical adjustment is expected.

**MAXIMUM TEMPERATURE:** 450°F at roller.

**INSTALLATION:** Two bolts and nuts provide anchorage to floor or top of steel beam or bracket or chair may be welded to supporting steel.

**HOW TO SIZE:**

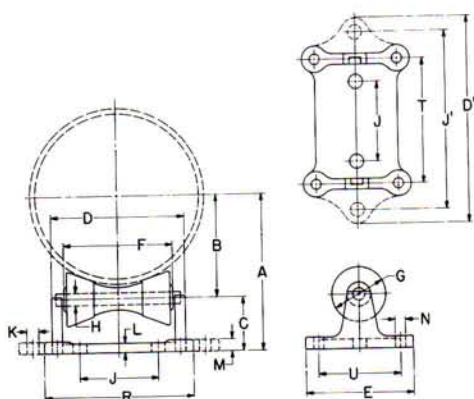
- (1) If roll is to support bare pipe, select the size directly from nominal pipe size (see below).
- (2) If used with pipe covering protection saddle, see pages ph-74, 75, 76 for size of pipe roll.
- (3) If roll is to support covered pipe, the O.D. of the covering should not be greater than the O.D. of the pipe for which the roll was designed.

**ORDERING:** Specify size of roll, figure number, name. Be certain to order oversized rolls where insulation makes this necessary.

**weights • dimensions (inches)**

pipe size	max recom load, lb	wgt (approx) lbs each	A	B	C	F	G	H
2	600	1.1	4	1¼	1½	¾ x 1½	¼ x 1¼	1½
2½	660	1.4	4½	1¼	1	¾ x 1½	¼ x 1¼	1½
3	700	1.6	5	2	1¼	¾ x 1½	¼ x 1¼	2¼
3½	750	2.6	6	2	2¼	¾ x 1½	¾ x 1½	2¼
4	750	2.9	6	2	2½	½ x 1½	¾ x 1½	2¼
5	750	3.9	7	3	2½	½ x 1½	¾ x 1½	3¼
6	1070	6.90	9	3	2	½ x 1½	¾ x 2	4
8	1350	6.0	11	3	3	¾ x 1½	¾ x 2	5
10	1730	9.0	14	5	3	¾ x 2	½ x 2	6
12	2400	18.9	16	5	4	¾ x 2	½ x 2	7
14	3130	28.07	18	6	4½	¾ x 2	½ x 2½	8
16	3970	34.93	21	8	5	¾ x 2½	½ x 3	9
18	4200	44.35	23	9	6	¾ x 2½	½ x 3	10
20	4550	56.34	24	10	6½	¾ x 2½	½ x 3	11
24	6160	87.52	29	12	7	¾ x 3½	¾ x 4	14
30	7290	151.25	34	15	8	¾ x 3½	¾ x 4	17

pipe roll stand  
complete: fig. 271  
pipe roll and rod: fig. 272  
pipe roll only: fig. 273



**SIZE RANGE:** 2 through 42 inch pipe.

**MATERIAL:** Cast iron roll and stand.

**FINISH:** Black or galvanized.

**SERVICE:** For support of pipe where longitudinal movement resulting from expansion and contraction may take place but vertical adjustment is unnecessary.

**MAXIMUM TEMPERATURE:** 450°F at roller.

**APPROVALS:** Complies with Federal Specification WW-H-171 E (Type 45) and Manufacturers Standardization Society SP-69 (Type 44).

**INSTALLATION:**

- (1) Two cored holes "K" for anchorage bolts are provided on all sizes for fastening stands to welded stands, to welded steel brackets, structural supports, piers, floors, etc.
- (2) In addition, cored holes "N" at the four corners of the stand are provided for anchorage purposes.
- (3) The two cored holes "K" on sizes 2 to 6 inch are on outside of stand (see dotted lines and dimension J').
- (4) On all other sizes, the holes "K" are inside of uprights (see dimension J).

**HOW TO SIZE:**

- (1) If roll is to support bare pipe, select the size directly from nominal pipe size (see below).
- (2) If used with pipe covering protection saddle, see pages ph-74-76 for size of pipe roll.

**ORDERING:** Specify pipe roll size, figure number, name. Be certain to order oversized rolls where insulation makes this necessary.

**NOTE:** Standard line of carbon steel base plates available.

**loads • weights**

pipe size	2 to 3½	4 to 6	8 to 10	12 to 14	16 to 20	24	30	36 to 42
max recom load, lb ■	390	950	2100	3075	4980	6100	7500	12000
complete, fig. 271: wgt (approx) lbs each	6.4	8.9	15.3	28.1	39.7	49.6	99.3	152.0
roll and rod, fig. 272: wgt (approx) lbs each	.9	13.5	5.3	10.1	15.7	19.5	33.9	59.0
roll only, fig. 273: wgt (approx) lbs each	.7	11.0	4.4	8.5	12.7	14.5	24.0	41.0

**dimensions (inches)**

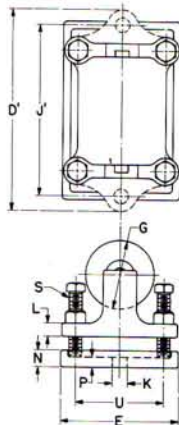
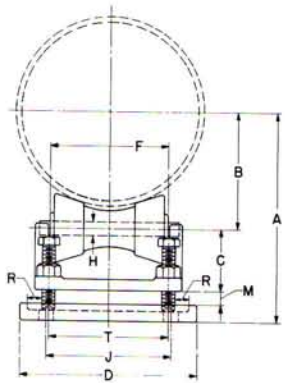
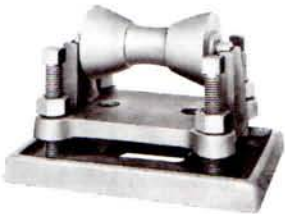
pipe size	A	B	C	D	D'	E	F	G	H	J	J'	K	L	M	N	R	T	U
2	3½	1¾																
2½	3⅞	2⅞																
3	4⅛	2¾	1¾	4	8¾	5¾	2¾	1⅞	½	...	6¾	1	9/16	11/16	½	...	37/16	4
3½	4¾	2⅝																
4	4 <sup>13</sup> / <sub>16</sub>	2¾																
5	5 <sup>7</sup> / <sub>16</sub>	3¾	2 <sup>1</sup> / <sub>16</sub>	5¾	9 <sup>7</sup> / <sub>8</sub>	5 <sup>5</sup> / <sub>8</sub>	3¾	2 <sup>1</sup> / <sub>16</sub>	½	...	7 <sup>7</sup> / <sub>8</sub>	1	¾	7/8	½	...	4 <sup>11</sup> / <sub>16</sub>	4¼
6	6 <sup>1</sup> / <sub>16</sub>	4																
8	8 <sup>11</sup> / <sub>16</sub>	5¼	3 <sup>7</sup> / <sub>16</sub>	7¾	...	6 <sup>5</sup> / <sub>8</sub>	6	3¼	¾	4	...	1	¾	7/8	5/8	8 <sup>5</sup> / <sub>8</sub>	7	5
10	9 <sup>13</sup> / <sub>16</sub>	6¾																
12	11¾	7½	3 <sup>7</sup> / <sub>8</sub>	9 <sup>7</sup> / <sub>8</sub>	...	7 <sup>7</sup> / <sub>8</sub>	8	4	7/8	5¾	...	1	¾	7/8	¾	10 <sup>15</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>16</sub>	6
14	12	8 <sup>1</sup> / <sub>8</sub>																
16	13 <sup>3</sup> / <sub>8</sub>	9¾																
18	14 <sup>5</sup> / <sub>8</sub>	10¾	4¼	11¼	...	8 <sup>5</sup> / <sub>8</sub>	9	4½	1⅞	6¾	...	1	7/8	1	1 <sup>3</sup> / <sub>16</sub>	12 <sup>3</sup> / <sub>8</sub>	10¼	6½
20	15 <sup>5</sup> / <sub>8</sub>	11¾																
24	17¾	13¾	4¾	12½	...	8 <sup>5</sup> / <sub>8</sub>	10	4 <sup>7</sup> / <sub>16</sub>	1¼	7½	...	1	1	1⅞	1 <sup>3</sup> / <sub>16</sub>	13½	11¾	6½
30	21 <sup>7</sup> / <sub>8</sub>	16¾	5⅞	15¾	...	10¾	12½	5½	1¾	10	...	1	1¼	1½	1 <sup>1</sup> / <sub>16</sub>	17	14¼	8
36	25¾	20	5¾	18¾	...	12	15	6¾	2	12	...	1	1½	1¾	1 <sup>5</sup> / <sub>16</sub>	20	17	9
42	28 <sup>7</sup> / <sub>8</sub>	23⅞																

■ Based on roll and stand only

# Grinnell

## pipe rolls

adjustable pipe roll stand  
with base plate: fig. 274  
without base plate: fig. 275  
base plate only: fig. 274P steel



### loads • weights

size, in.	max recom load, lb	weight (approx) lbs each		
		fig. 274	fig. 275	fig. 274P
2 to 3½	390	15.2	7.8	7.5
4 to 6	950	19.3	10.3	9.0
8 to 10	2100	32.1	18.1	14.0
12 to 14	3075	51.2	32.1	19.1
16 to 20	4980	71.3	45.3	26.0
24	6100	87.0	55.0	32.0
30	7500	166.2	109.2	57.0
36 to 42	12000	304.0	176.0	128.0

### dimensions (inches)

pipe size	A		B	C	D	D'	E	F	G	H	J	J'	K	L	M max	N	P	R	S	T	U	
	min	max																				
2	5½	5¾	1¾			8¾						6¾										
2½	5¾	5¾	2½			8¾						6¾										
3	5¾	6	2¾	1¾	6¾	8¾	5½	2¾	1¾	½	3¾	6¾	1	11/16	7/8	1	¾	1	5/8	37/16	4	
3½	6	6¼	2¾			8¾						6¾										
4	6½	7	2¾			9¾						7¾										
5	7	7½	3¾	2¹/16	8½	9¾	5¾	3¾	2¹/16	½	5½	7¾	1	7/8	1½	1	¾	1	5/8	4¹¹/16	4¼	
6	7¾	8½	4			9¾						7¾										
8	10¾	11¾	5¼	37/16	10½	...	6¾	6	3¼	¾	7¾	...	1	7/8	1¾	1½	13/16	1	¾	7	5	
10	11½	12¾	6¾			...						...										
12	13	14¼	7½	3¾	13	...	8	8	4	7/8	9½	...	1	7/8	1¾	1½	¾	1	7/8	9¹/16	6	
14	13¾	14¾	8½			...						...										
16	15¼	16¾	9¾			...	8½	9	4½	1½	11½	...	1	1	1¾	1¼	7/8	1³/16	1	10¼	6½	
18	16¾	17¾	10¾	4¼	14½	...						...										
20	17¾	18¾	11¾			...						...										
24	19¾	21	13¾	4¾	15¾	...	8½	10	47/16	1¼	12¼	...	1	1½	1¾	1¾	1	1³/16	1	11¾	6½	
30	24	26¾	16¾	5½	19¼	...	10½	12½	5½	1¾	15¾	...	1	1½	3¼	1½	1¼	1¾	1¼	14¼	8	
36	28¾	21¾	20	5¾	23	...	11	15	6¾	2	19	...	1½	1¾	4½	2	1½	2¼	1½	17	9	
42	31½	34¾	23½	5¾	23	...	11	15	6¾	2	19	...	1½	1¾	4½	2	1½	2¼	1½	17	9	

**SIZE RANGE:** 2 through 42 inch pipe.

**MATERIAL:** Cast iron base plate, stand roll; steel adjusting screws.

**FINISH:** Black or galvanized.

**SERVICE:** To support pipe lines where vertical and lateral adjustment during installation may be required in addition to provision for expansion and contraction.

**MAXIMUM TEMPERATURE:** 450°F at roller.

**APPROVALS:** Complies with Federal Specification WW-H-171 E (Type 47) and Manufacturers Standardization Society SP-69 (Type 46).

**INSTALLATION:** Base plate is provided with two cored holes for anchorage to floor, pier, structural support and similar constructions, as well as to welded steel brackets fig. 195 and fig. 199, page ph-44. Adjustable pipe roll stand *without base plate*, fig. 275, can be used for supporting tunnel piping, etc., by resting ends of adjusting screws on structural steel angles, channels, etc.

**ADJUSTMENT:** Vertical adjustment is obtained by use of the four adjusting screws located on corners of stand. Lateral adjustment is secured by stand sliding on each of adjusting screws.

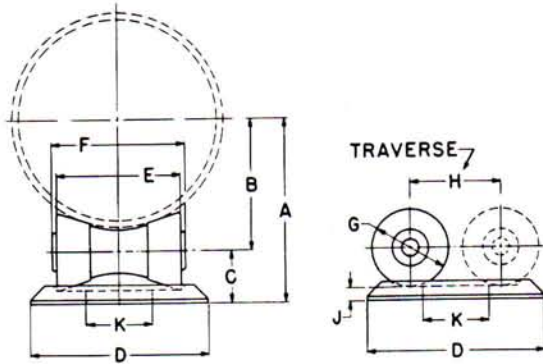
### HOW TO SIZE:

- (1) If roll is to support bare pipe, select the size directly from nominal pipe size (see below).
- (2) If used with pipe covering protection saddle, see pages ph-74-76, for size of pipe roll.

**ORDERING:** Specify pipe roll size, figure number, name. For further dimensions of stand, see fig. 271, page ph-82. Be certain to order oversized rolls where insulation makes this necessary.

**NOTE:** Standard line of carbon steel base plates available.

pipe roll and plate  
complete: fig. 277  
base plate only: fig. 277P steel



**SIZE RANGE:** 2 through 24 inch pipe.

**MATERIAL:** Cast iron roll and plate.

**FINISH:** Black or galvanized.

**SERVICE:** For support of pipe where small horizontal movement due to expansion and contraction may occur and where vertical adjustment is unnecessary.

**MAXIMUM TEMPERATURE:** 450°F at roller.

**APPROVALS:** Complies with Federal Specification WW-H-171 E (Type 46) and Manufacturers Standardization Society SP-69 (Type 45).

**INSTALLATION:** Consist of sitting the unit in place, weight of pipe and material hold unit in place.

**HOW TO SIZE:**

- (1) If roll is to support bare pipe, select the size directly from nominal pipe size (see below).
- (2) If used with pipe covering protection saddle, see pages ph-74-76, for size of pipe roll.

**FEATURES:** An economical, practical manner of supporting pipe with limited horizontal movement due to expansion and contraction.

**ORDERING:** Specify pipe roll size, figure number, name. Be certain to order oversized rolls where insulation makes this necessary.

**NOTE:** Standard line of fabricated carbon steel base plates available for extended travel.

**loads • weights • dimensions (inches)**

pipe size	max recom load, lb	wgt (approx) lbs each		A	B	C	D	E	F	G	H	J	K
		fig. 277	fig. 277P										
2	390	4.0	3.3	3/4	1 3/4	17/16	4 3/4	2 5/8	2 3/4	1 7/8	1 3/4	1/2	...
2 1/2				3 1/2	2 1/8								
3				3 13/16	2 3/8								
3 1/2				4 1/16	2 5/8								
4	950	5.6	4.5	4 5/16	2 3/4	1 9/16	5 3/4	3 5/8	3 3/4	2 1/16	2 5/8	1/2	1 1/2
5				4 15/16	3 3/8								
6				5 1/2	4								
8				7 9/16	5 1/4								
10	2100	15.3	10.9	8 11/16	6 3/8	2 5/16	8 1/4	5 5/8	6	3 3/4	4	1 1/16	2 1/2
12				10 1/4	7 1/2								
14				10 7/8	8 1/8								
16				12 3/8	9 3/8								
18	4980	43.7	31.0	13 1/2	10 3/8	3 1/8	12	8 1/2	9	4 1/2	6 3/8	7/8	5
20				14 1/2	11 3/8								
24				16 5/8	13 3/8								
24				16 5/8	13 3/8								

# Grinnell

## pipe straps

### pipe straps

fig. 242 A, 243 A, 244 A

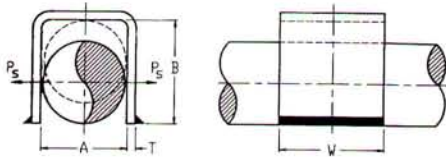


Fig. 242A

Pipe Size	A	B	T	W	Rated Load
1/2	1	3	1/4	2	125
3/4	1 3/16	3	1/4	2	125
1	1 7/16	3 1/4	1/4	2	125
1 1/4	1 3/4	3 1/2	3/8	3	300
1 1/2	2	4	3/8	3	300
2	2 1/2	4 1/2	3/8	3	300
2 1/2	3	5	1/2	3	450
3	3 9/16	5 1/2	1/2	4	450
4	4 9/16	6 1/2	1/2	4	450
6	6 3/4	8 1/2	1/2	6	500

**SIZE RANGE:** 1/2 to 6 inch pipe. Larger sizes available upon request..

**MATERIAL:** Carbon Steel.

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

**MAXIMUM TEMPERATURE:** 650°F.

**ORDERING:** Specify fig. number, name, and pipe size.

**FINISH:** Black.

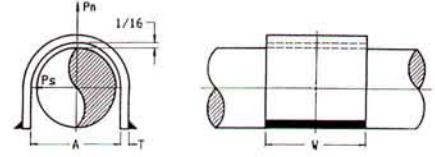


Fig. 244A

Pipe Size	Rated Load		A	T	W
	Ps	Pn			
1/2	250	1500	1	1/4	2
3/4	250	1500	1 3/16	1/4	2
1	250	1500	1 7/16	1/4	2
1 1/4	500	2000	1 3/4	3/8	3
1 1/2	500	2000	2	3/8	3
2	500	2000	2 1/2	3/8	3
2 1/2	650	2300	3	1/2	3
3	650	2300	3 9/16	1/2	4
4	650	2300	4 9/16	1/2	4
6	700	2300	6 3/4	1/2	6

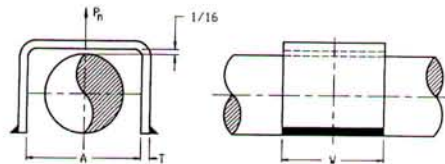


Fig. 243A

Pipe Size	A	T	W	Rated Load
1/2	3	1/4	2	600
3/4	3 1/2	1/4	2	600
1	4	1/4	2	600
1 1/4	4 1/2	3/8	3	1500
1 1/2	5	3/8	3	1500
2	5 1/2	3/8	3	1500
2 1/2	6	1/2	3	2500
3	6 1/2	1/2	4	2800
4	7 1/2	1/2	4	2800
6	9 3/4	1/2	6	3000



### pipe alignment guide spec. fig. 255



**SIZE RANGE:** 1 through 24 inch pipe and insulation thickness of 1 through 4 inch. (Also available in copper tube sizes).

**MATERIAL:** Carbon Steel.

**FINISH:** Black or galvanized.

**SERVICE:** For maintaining alignment of piping through its axial expansion and contraction cycles. Normally, two or more pipe alignment guides are used on a single piping run to avoid a pivoting effect within the piping system. It is recommended that the first guide be located a maximum of four pipe diameters from an expansion joint. Additional guides should be employed in accordance with the guide spacing data shown below. Supports are usually required between the intermediate guides to comply with standard support practice.

**MAXIMUM TEMPERATURE:** 650°F.

**INSTALLATION:**

- (1) Attach outer housing to structure by bolting or welding.
- (2) Remove upper section of housing to open position.
- (3) Attach spider clamp to pipe and completely insulate.
- (4) Set pipe and spider clamp into outer housing. Note: Spider attachments to pipe must be properly located during installation to insure that a minimum of one-half the spider width remains within the length of the outer housing for all conditions of operation. See table on opposite page for maximum recommended travels. If larger travels are required, special guides can be furnished to special order.

**HOW TO SIZE:** Size by nominal pipe size and insulation thickness in accordance with the selection table on the opposite page.

**ORDERING:** Specify size number, pipe size, insulation thickness and figure number.

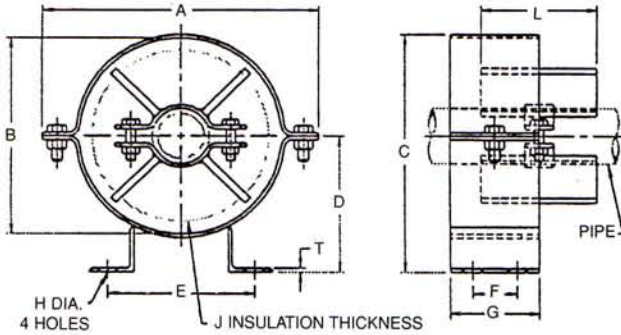
**NOTE:** Guides not designed to carry dead weight load.

nom. pipe size (in.)	maximum distance (feet) between intermediate guides for pressure (psig)									
	50	100	150	200	250	300	350	400	500	600
3	38	27	22	20	18	17	15	14	13	12
4	52	37	32	27	25	23	22	19	17	16
6	66	47	40	35	31	28	27	25	23	20
8	85	62	51	45	40	36	35	32	29	27
10	103	75	62	54	50	45	42	40	35	32
12	118	85	70	60	55	50	46	43	40	35
14	120	87	72	62	57	52	48	45	41	37
16	130	95	78	68	61	57	52	49	45	41
18	145	105	87	75	68	62	58	55	50	45
20	155	110	92	90	73	68	62	58	53	49
24	180	128	105	90	83	75	70	65	60	54

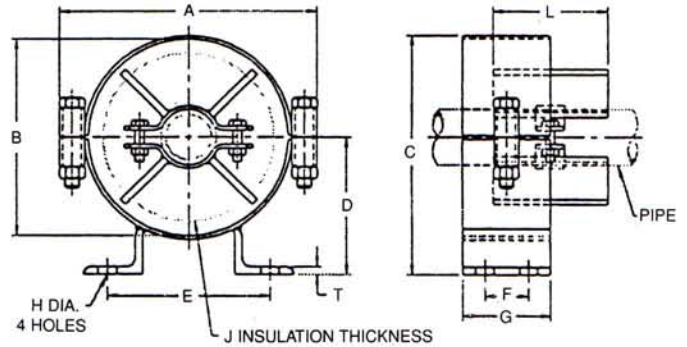
# Grinnell pipe guide

fig. 255

PIPE ALIGNMENT GUIDE, FIGURE 255, SIZE A & B



PIPE ALIGNMENT GUIDE, FIGURE 255, SIZE C THRU J



**GUIDE SIZE SELECTION TABLE:** Locate bare nominal pipe size in appropriate insulation thickness column and read guide size from "size no." column to the left.

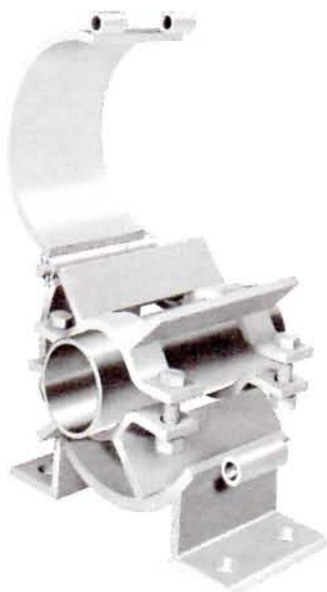
pipe size	L	maximum movement
1" to 6"	4	4
8" to 16"	6	6
18" to 24"	8	8

guide size no.	PIPE SIZE					
	insulation thickness (inches)					
	1	1½	2	2½	3	4
A	1-1½	1-1½	1-1½	-	-	-
B	2-3½	2-3½	2-3½	2 & 2½	-	-
C	4 & 5	4 & 5	4 & 5	1 & 4	1-2 & 4	1-2
D	6	6	6	3, 3½ & 6	2½-3½ & 6	2½-4
E	-	8	8	5 & 6	5 & 6	5 & 6
F	-	10 & 12	10 & 12	10 & 12	10 & 12	8 & 10
G	-	-	14 & 16	14 & 16	14 & 16	12 & 16
H	-	-	-	-	18 & 20	18 & 20
J	-	-	-	-	24	24

**dimensions (inches)**

guide size no.	A	B	C	D	E	F	G	H	T
A	8⅜	6¾	8	4¾	5¾	2	4	¾	¼
B	10⅜	8¾	10	5¾	7	2	4	¾	¼
C	13⅜	11¼	12⅜	6¾	7¾	2	4	¾	¼
D	15⅜	13¾	14⅜	7¾	9¾	2	4	¾	⅝
E	18	15½	17⅜	9¾	9¾	2	4	¾	⅝
F	22¼	19¾	21⅜	11	14¾	4	6	1	¾
G	28	25	25¼	13⅜	15⅜	4	6	1	¾
H	32¼	29¾	30¾	15¾	16¾	5½	8	1	¾
J	37¾	34¾	36¾	18¾	17¾	5½	8	1	¾

pipe alignment guide  
fig. 256



**FINISH:** Black or galvanized.

**SIZE RANGE:** 1 through 24 inch pipe and insulation thickness of 1 through 4 inch.

**MATERIAL:** Carbon steel.

**SERVICE:** For maintaining alignment of piping through its axial expansion and contraction cycles. Normally, two or more pipe alignment guides are used on a single piping run to avoid a pivoting effect within the piping system. It is recommended that the first guide be located a maximum of four pipe diameters from an expansion joint. Additional guides should be employed in accordance with the guide spacing data shown below. Supports are usually required between the intermediate guides to comply with standard support practice.

**MAXIMUM TEMPERATURE:** 750°F.

**INSTALLATION:**

- (1) Attach outer housing to structure by bolting or welding.
- (2) Swing upper section of housing to open position.
- (3) Attach spider clamp to pipe and completely insulate.
- (4) Set pipe and spider clamp into outer housing.

**Note:** Spider attachments to pipe must be properly located during installation to insure that a minimum of one-half the spider width remains within the length of the outer housing for all conditions of operation. See table on opposite page for maximum recommended travels. If larger travels are required, special guides can be furnished to special order.

**HOW TO SIZE:** Size by nominal pipe size and insulation thickness in accordance with the selection table on opposite page.

**ORDERING:** Specify size number, pipe size, insulation thickness and figure number.

**NOTE:** Guides not designed to carry dead weight load.

**recommended expansion joint guide spacing**

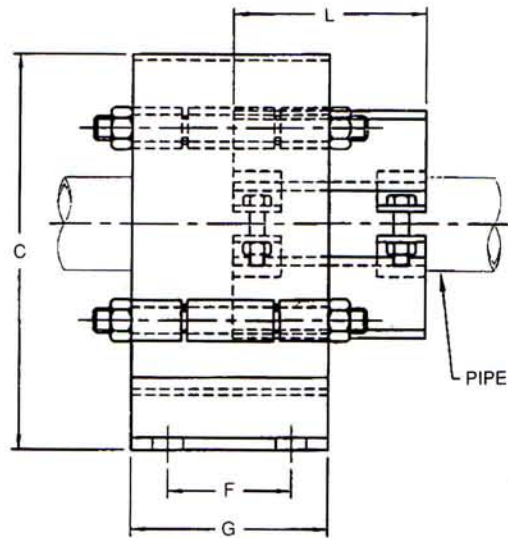
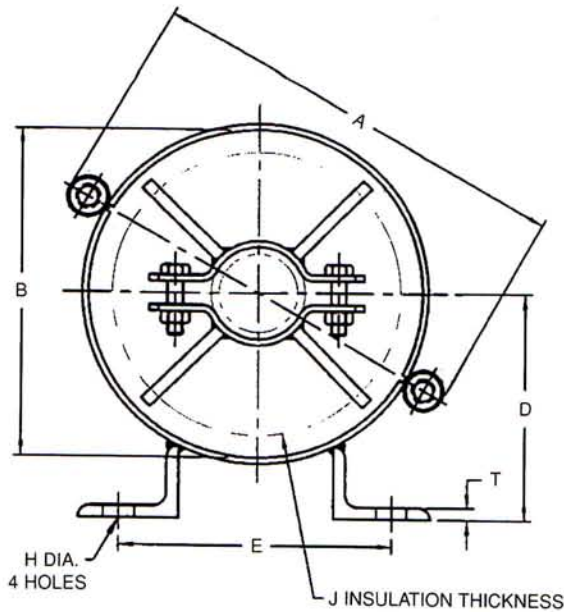
nom pipe size (in.)	maximum distance (feet) between intermediate guides for pressure (psig)									
	50	100	150	200	250	300	350	400	500	600
3	38	27	22	20	18	17	15	14	13	12
4	52	37	32	27	25	23	22	19	17	16
6	66	47	40	35	31	28	27	25	23	20
8	85	62	51	45	40	36	35	32	29	27
10	103	75	62	54	50	45	42	40	35	32
12	118	85	70	60	55	50	46	43	40	35
14	120	87	72	62	57	52	48	45	41	37
16	130	95	78	68	61	57	52	49	45	41
18	145	105	87	75	68	62	58	55	50	45
20	155	110	92	80	73	68	62	58	53	49
24	180	128	105	90	83	75	70	65	60	54

continued on next page

# Grinnell

## pipe guide

fig. 256



**GUIDE SIZE SELECTION TABLE:** Locate bare nominal pipe size in appropriate insulation thickness column and read guide size from "size no." column to the left.

pipe size	L	maximum movement
1" to 6"	6	6
8" to 16"	8	8
18" to 24"	10	10

guide size no.	PIPE SIZE					
	J insulation thickness (inches)					
	1	1½	2	2½	3	4
A	1-1½	1-1½	1-1½	-	-	-
B	2-3½	2-3½	2-3½	2 & 2½	-	-
C	4 & 5	4 & 5	4 & 5	1 & 4	1-2 & 4	1-2
D	6	6	6	3, 3½ & 6	2½-3½ & 6	2½-4
E	-	8	8	5 & 8	5 & 8	5 & 6
F	-	10 & 12	10 & 12	10 & 12	10 & 12	8 & 10
G	-	-	14 & 16	14 & 16	14 & 16	12-16
H	-	-	-	-	18 & 20	18 & 20
J	-	-	-	-	24	24

### dimensions (inches)

guide size no.	A	B	C	D	E	F	G	H	T
A	8 <sup>3</sup> / <sub>16</sub>	6 <sup>3</sup> / <sub>16</sub>	7 <sup>3</sup> / <sub>16</sub>	4 <sup>3</sup> / <sub>16</sub>	6 <sup>3</sup> / <sub>16</sub>	1½	4	¾	¼
B	10 <sup>3</sup> / <sub>16</sub>	8 <sup>3</sup> / <sub>16</sub>	9 <sup>3</sup> / <sub>16</sub>	5 <sup>3</sup> / <sub>16</sub>	7 <sup>3</sup> / <sub>16</sub>	1½	4	¾	¼
C	13 <sup>3</sup> / <sub>16</sub>	11 <sup>3</sup> / <sub>16</sub>	12 <sup>3</sup> / <sub>16</sub>	6 <sup>3</sup> / <sub>16</sub>	7 <sup>3</sup> / <sub>16</sub>	2	6	¾	¼
D	15 <sup>3</sup> / <sub>16</sub>	13 <sup>3</sup> / <sub>16</sub>	14 <sup>3</sup> / <sub>16</sub>	7 <sup>3</sup> / <sub>16</sub>	9 <sup>3</sup> / <sub>16</sub>	2	6	¾	5 <sup>3</sup> / <sub>16</sub>
E	18	15½	17 <sup>3</sup> / <sub>16</sub>	9 <sup>3</sup> / <sub>16</sub>	9 <sup>3</sup> / <sub>16</sub>	2	6	1	¾
F	22¼	19¼	21 <sup>3</sup> / <sub>16</sub>	11	14¼	4	8	1	¾
G	28	25	26¼	13 <sup>3</sup> / <sub>16</sub>	15¼	4	8	1	¾
H	32¼	29¼	30¼	15¼	16¼	5½	8	1	¾
J	37¼	34¼	36¼	18¼	17¼	5½	8	1	¾

## PTFE Pipe Slide Assemblies

### Application

Grinnell PTFE pipe slide assemblies are designed to support the pipe and provide for lateral and axial movement due to thermal expansion and contraction of the piping system.

Assemblies are fabricated using PTFE slide bearings to provide a low coefficient of friction, minimizing frictional stress on the pipe and support structure.

### Features

- Pre-engineered to save calculation and installation time.
- PTFE slide bearing pads are composed of 100% virgin tetrafluoroethylene polymer.
- Capable of supporting constant loads up to 2000 p.s.i. at 70°F.
- The low 0.2 friction factor for the PTFE slide assemblies permits a smooth, unrestrained movement of the pipe and reduces overturning moments on supporting structures.
- PTFE is chemically inert and resists attack by chemicals, humidity and other elements found in harsh environments provided that the steel supports are suitably protected.
- Self-lubricating, maintenance-free.
- Provides electrical resistance to galvanic corrosion between pipe and support structure.
- Maximum temperature: 400°F.

### Selection

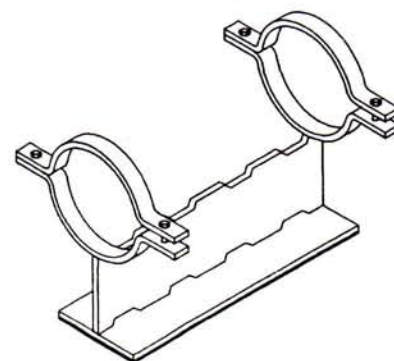
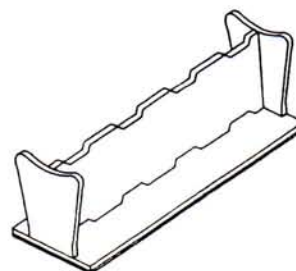
1. Determine the support location based on allowable span and loading conditions.
2. Calculate the load for each slide assembly location.
3. Determine the lateral and axial movement of the pipe and the direction of movement, cold to hot.
4. Select pipe slide or anchor figure number and attachment configuration, welded or bolted.
5. Select the method of slide plate attachment to support structure, welded or bolted.
6. Designate whether guided or non-guided slide plate is required.
7. Special designed slides and anchors available on request. Allows for up to 2½" insulation thickness as standard. Up to 4" insulation available on special request.
8. Maximum recommended loads shown for pipe slides and anchors are for vertical loading. Transitional loads for pipe anchors are to be determined by customer.

The maximum load on the pipe slides is based on using a PTFE width of 2" for the slide plate and a 70°F temperature. For a different temperature at the bearing surfaces, multiply the maximum load rating by the following factor.

Temperature °F	Factor
≤ 70	1.00
100	.85
200	.55
300	.40
400	.25

### Installation

1. Determine offset of pipe slide-slide plate interface to allow maximum pipe movement in direction of greatest thermal displacement.
2. Attach PTFE slide to pipe by welding or clamping with standard fig. 212 pipe clamp or fig. 432 special pipe clamp.
3. Attach slide plates to supporting structure by bolting or welding.
4. Verify setting to insure full bearing between the PTFE slide and slide base surfaces under all pipe movement conditions.



# Grinnell

## pipe slides

### pipe slide assembly, complete

fig. 257 - structural tee slide assembly

fig. 257A - structural tee anchor

fig. 436 - fabricated tee slide assembly

fig. 436A - fabricated tee anchor

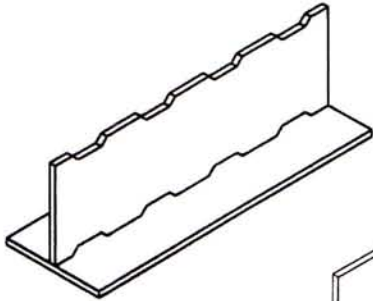


figure 436A

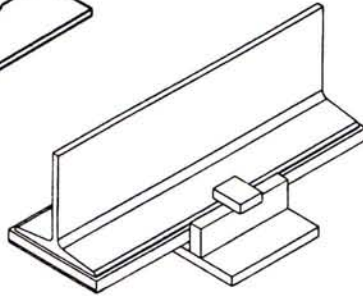


figure 257, type 3

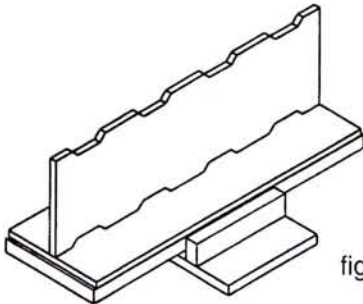


figure 436, type 2

**SIZE RANGE:** All sizes within maximum load rating.

**MATERIAL:** Carbon steel tee, PTFE bonded slide plates and carbon steel base.

**FINISH:** Black, painted or galvanized.

**SERVICE:** For the support of piping where horizontal movement resulting from expansion and contraction takes place and where a low coefficient of friction is desired.

**APPROVALS:** Complies with the requirements of MSS SP-58 and SP-69.

**MAXIMUM LOAD RATING:** 8000 lbs. at 70°F. See ph-91 for rating factor at higher temperatures.

**MAXIMUM OPERATING TEMPERATURE:** 750°F.

**TEMPERATURE RANGE AT PTFE:** -200°F to 400°F.

#### FEATURES:

- no lubrication required
- designed to minimize heat loss
- allows up to 3" of insulation
- allows up to 10" travel standard
- weld in place design

#### AVAILABLE OPTIONS:

- increased travels
- increased heights
- end plates
- clamps, fig. 212 or fig. 432
- base plate with mounting holes

**ORDERING:** Specify Figure Number, Type, Name and any other option desired.

#### Notes:

Types 1, 2 and 3 provide for longitudinal movement only.

Types 4, 5 and 6 provide for both longitudinal and transverse movement of piping.

#### Welded Bases

Type	H*	W	BL	TL	Weights
1	4.25	4.125	2	12	11.99
2	4.5	8	4	12	16.38
3	4.5	8	4	12	17.37
4	4.25	6.125	2	12	16.45
5	4.5	10.5	4	12	17.44
6	4.5	10.5	4	12	19.28

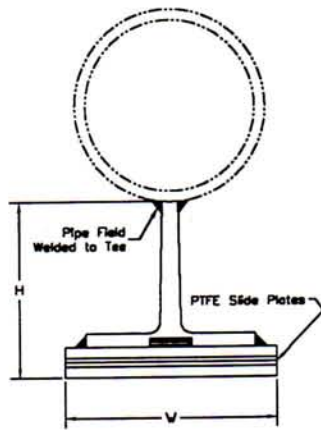
\*with clamps; add material thickness of a Figure 212

\*with continuous clamp add material thickness of Figure 432

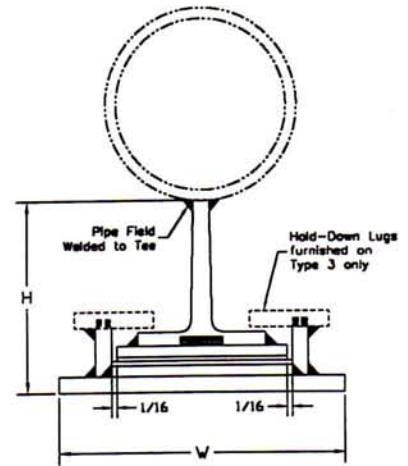
#### Bolted Bases\*

Type	H	W	BL	TL	Weights
1	4.5	8	4	12	16.38
2	4.5	8	4	12	16.38
3	4.5	8	4	12	17.37
4	4.5	10.5	4	12	17.44
5	4.5	10.5	4	12	17.44
6	4.5	10.5	4	12	19.28

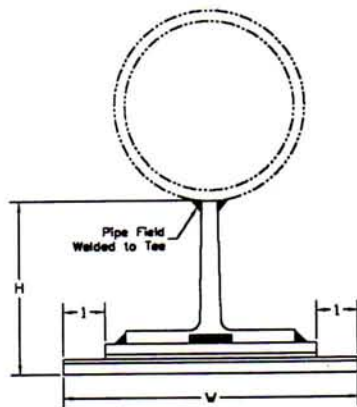
\*Hole locations are 1" smaller than W x BL (Ex: 7" x 3")



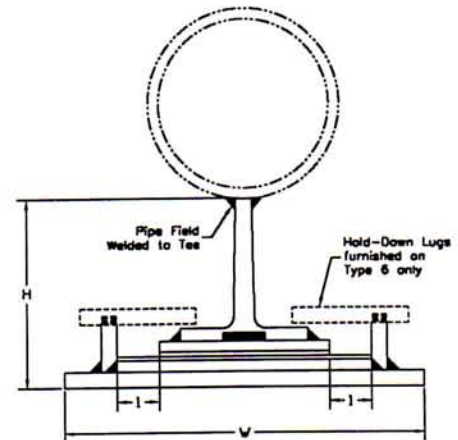
Type 1



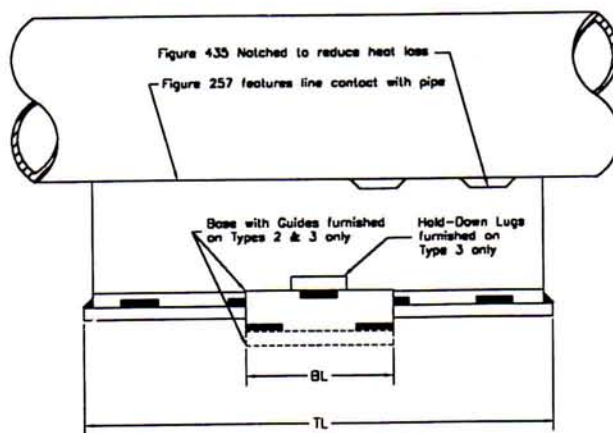
Type 2 & 3



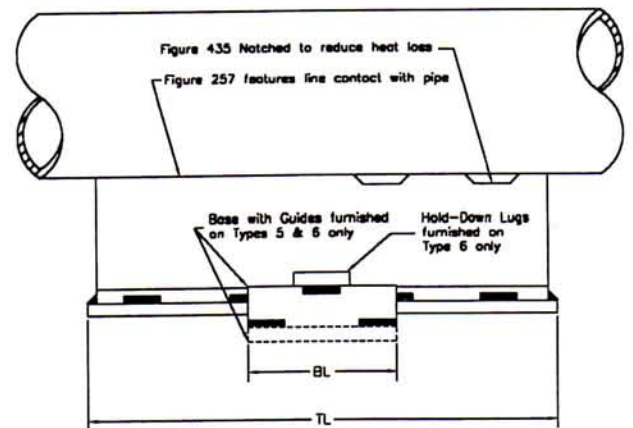
Type 4



Type 5 & 6



Type 1, 2 & 3



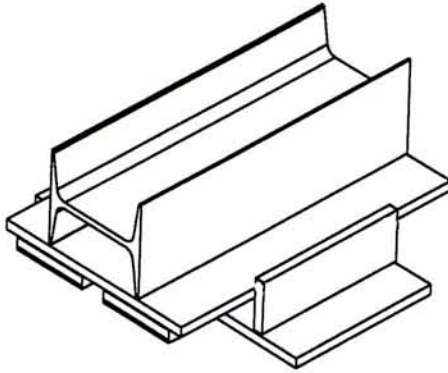
Type 4, 5 & 6

# Grinnell

## pipe slides

### pipe slide assembly, complete

fig. 439 - structural "H" slide assembly



#### Notes:

Types 1, 2 and 3 provide for longitudinal movement only.

Types 4 and 5 provide for both longitudinal and transverse movement of piping.

**SIZE RANGE:** 6 through 36 inch pipe.

**MATERIAL:** Carbon steel H section, PTFE bonded slide plates and carbon steel base.

**FINISH:** Black, painted or galvanized.

**SERVICE:** A heavy duty slide support where horizontal movement resulting from expansion and contraction takes place and where a low coefficient of friction is desired.

**APPROVALS:** Complies with the requirements of MSS SP-58 and SP-69.

**MAXIMUM LOAD RATING:** As indicated at 70°F. See ph-91 for rating factor at higher temperatures.

**MAXIMUM OPERATING TEMPERATURE:** 750°F.

**TEMPERATURE RANGE AT PTFE:** -200°F to 400°F.

#### FEATURES:

- no lubrication required
- allows up to 4" of insulation
- allows up to 10" travel standard
- weld in place design

#### AVAILABLE OPTIONS:

- increased travels
- increased heights
- clamps, fig. 212 or fig. 432
- base plate with mounting holes

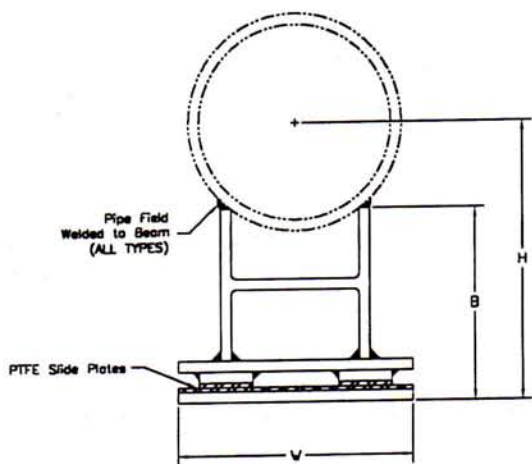
**ORDERING:** Specify Figure Number, Type, Name and any other option desired.

nominal pipe size	W				B			H*			TL	BL		max. load	approx. weight									
	1	TYPE 2 & 3		4	5	TYPE 1 & 4		2 & 5	3	TYPE 1 & 4		2 & 5	3		ALL	TYPE 1 & 4		2, 3 & 6	TYP 1	TYP 2	TYP 3	TYP 4	TYP 5	
6	6	10	8	12	5	5 <sup>1</sup> / <sub>4</sub>	5 <sup>5</sup> / <sub>16</sub>	7 <sup>3</sup> / <sub>4</sub>	8	8 <sup>1</sup> / <sub>16</sub>	12	2	6	12,000	19.3	27.8	29.8	19.7	29.5					
8	8	10	8	12	5	5 <sup>1</sup> / <sub>4</sub>	5 <sup>5</sup> / <sub>16</sub>	8 <sup>3</sup> / <sub>4</sub>	9	9 <sup>1</sup> / <sub>16</sub>	12	2	6	12,000	19.3	27.8	29.8	19.7	29.5					
10	8	12	10	14	5 <sup>1</sup> / <sub>8</sub>	5 <sup>3</sup> / <sub>8</sub>	5 <sup>7</sup> / <sub>16</sub>	9 <sup>5</sup> / <sub>8</sub>	9 <sup>7</sup> / <sub>8</sub>	9 <sup>15</sup> / <sub>16</sub>	12	2	6	16,000	24.7	34.5	36.4	25.1	36.1					
12	8	12	10	14	5 <sup>1</sup> / <sub>8</sub>	5 <sup>3</sup> / <sub>8</sub>	5 <sup>7</sup> / <sub>16</sub>	10 <sup>3</sup> / <sub>4</sub>	11	11 <sup>1</sup> / <sub>16</sub>	12	2	6	16,000	24.7	34.5	36.4	25.1	36.1					
14	10	14	12	16 <sup>1</sup> / <sub>2</sub>	5 <sup>1</sup> / <sub>8</sub>	5 <sup>3</sup> / <sub>8</sub>	5 <sup>7</sup> / <sub>16</sub>	10 <sup>7</sup> / <sub>8</sub>	11 <sup>1</sup> / <sub>8</sub>	11 <sup>3</sup> / <sub>16</sub>	12	2	6	16,000	28.1	39.1	41.6	28.6	41.0					
16	10	14	12	16 <sup>1</sup> / <sub>2</sub>	5 <sup>1</sup> / <sub>8</sub>	5 <sup>3</sup> / <sub>8</sub>	5 <sup>7</sup> / <sub>16</sub>	12 <sup>1</sup> / <sub>8</sub>	12 <sup>3</sup> / <sub>8</sub>	12 <sup>7</sup> / <sub>16</sub>	12	2	6	16,000	28.1	39.1	41.6	28.6	41.0					
18	12	16 <sup>1</sup> / <sub>2</sub>	14	16 <sup>1</sup> / <sub>2</sub>	5 <sup>1</sup> / <sub>8</sub>	5 <sup>3</sup> / <sub>8</sub>	5 <sup>7</sup> / <sub>16</sub>	12 <sup>5</sup> / <sub>8</sub>	12 <sup>7</sup> / <sub>8</sub>	12 <sup>15</sup> / <sub>16</sub>	12	2	6	16,000	32.6	45.0	47.5	33.0	46.6					
20	12	16 <sup>1</sup> / <sub>2</sub>	14	18 <sup>1</sup> / <sub>2</sub>	5 <sup>1</sup> / <sub>8</sub>	5 <sup>3</sup> / <sub>8</sub>	5 <sup>7</sup> / <sub>16</sub>	13 <sup>3</sup> / <sub>4</sub>	14	14 <sup>1</sup> / <sub>16</sub>	12	2	6	16,000	32.6	45.0	47.5	33.0	46.6					
24	14	18 <sup>1</sup> / <sub>2</sub>	16	21	5 <sup>1</sup> / <sub>4</sub>	5 <sup>1</sup> / <sub>2</sub>	5 <sup>9</sup> / <sub>16</sub>	15 <sup>5</sup> / <sub>8</sub>	15 <sup>7</sup> / <sub>8</sub>	15 <sup>15</sup> / <sub>16</sub>	12	2	6	24,000	41.0	54.6	59.2	41.4	68.8					
30	16	21	18	23	6 <sup>1</sup> / <sub>4</sub>	6 <sup>5</sup> / <sub>8</sub>	6 <sup>11</sup> / <sub>16</sub>	19 <sup>5</sup> / <sub>8</sub>	19 <sup>7</sup> / <sub>8</sub>	20 <sup>1</sup> / <sub>16</sub>	12	2	8	24,000	51.4	78.8	84.0	51.8	81.4					
36	18	23	20	25	6 <sup>7</sup> / <sub>16</sub>	6 <sup>13</sup> / <sub>16</sub>	6 <sup>3</sup> / <sub>4</sub>	23	23 <sup>1</sup> / <sub>4</sub>	23 <sup>7</sup> / <sub>16</sub>	12	2	8	24,000	55.8	85.4	90.6	56.3	87.7					

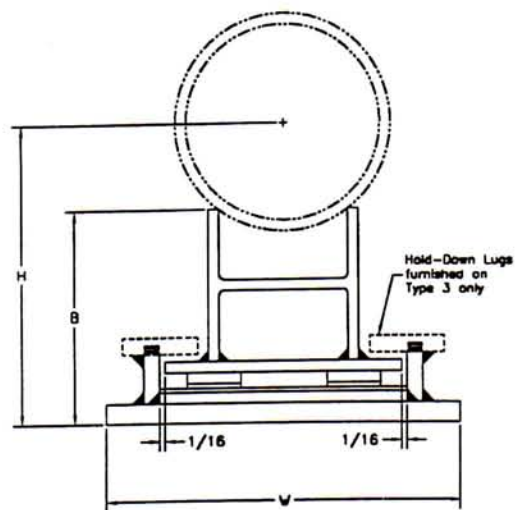
\*with clamps: add material thickness of a Figure 212

\*with continuous clamp: add material thickness of Figure 432

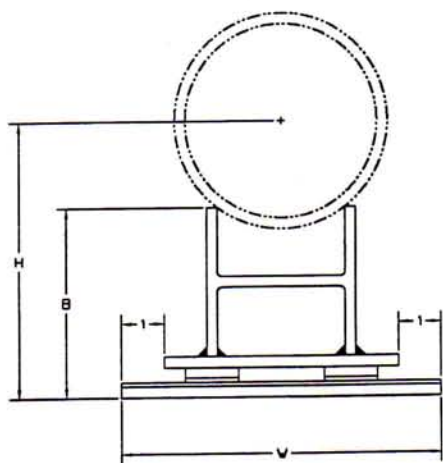




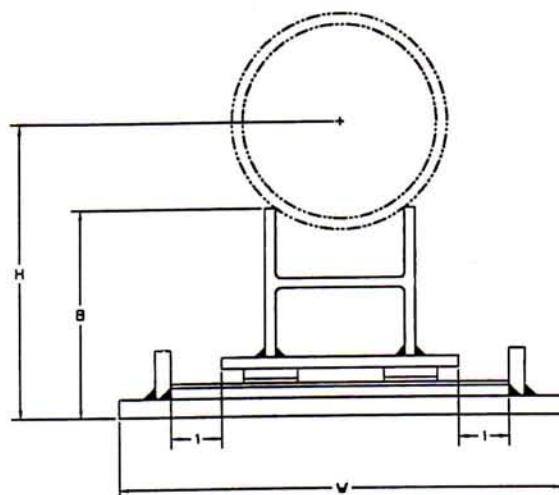
TYPE 1



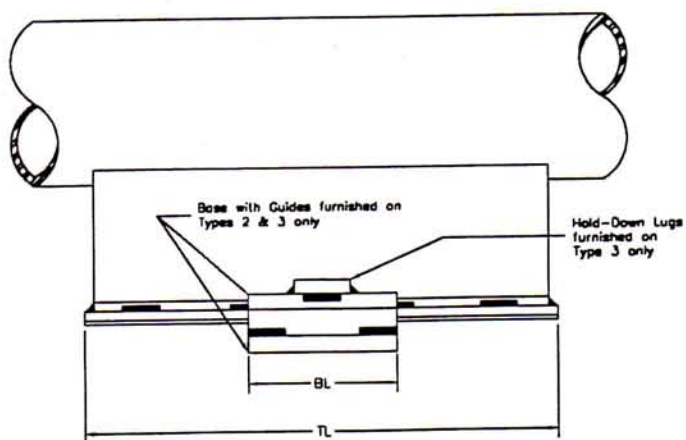
TYPE 2 & 3



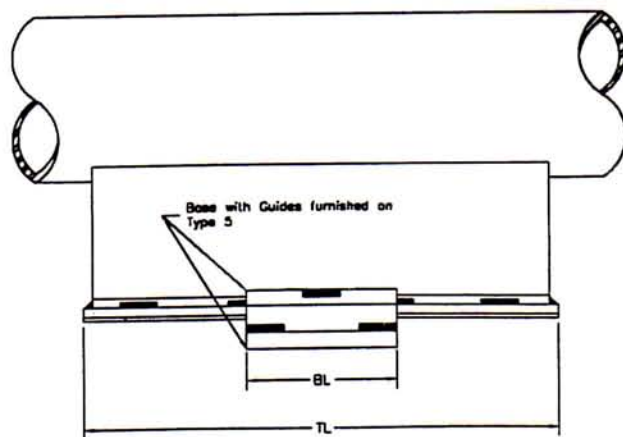
TYPE 4



TYPE 5

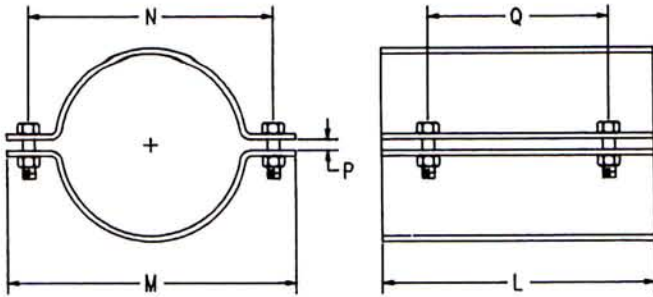


TYPE 1, 2 & 3



TYPE 4 & 5

**fig. 432**  
**special clamp**



**SIZE RANGE:** 2 through 24 inch pipe.

**MATERIAL:** Carbon Steel.

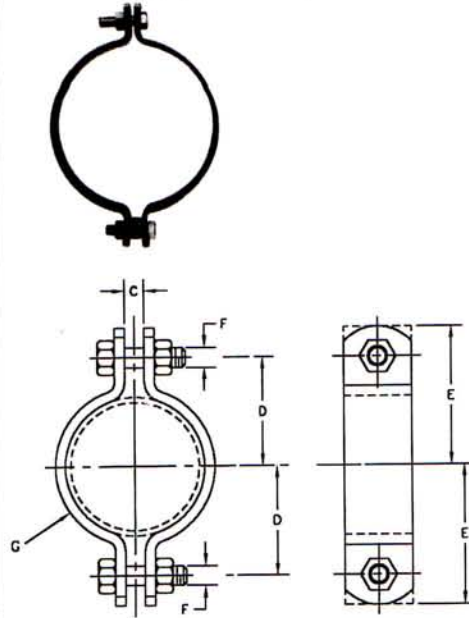
**FINISH:** Black, Painted, or Galvanized.

**SERVICE:** Used with and where pipe slides cannot be welded directly to pipe or copper tube. When used with figerglass, plastic, or aluminum pipe, a thin protective liner should be inserted between the pipe and the clamp. Clamp is designed for use with figure 280 and figure 435 slides and anchors. Figure 212 pipe clamp is the standard clamp used with figure numbers 280, 435, 436, and 437 slides and anchors.

**ORDERING:** Specify figure number, pipe size, finish.

pipe size	L	M	N	P	Q	stock thick.	approx. wt. each
2	6	4 <sup>3</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>4</sub>	1/4	4 <sup>1</sup> / <sub>2</sub>	1/8	2
2 <sup>1</sup> / <sub>2</sub>	6	5 <sup>1</sup> / <sub>4</sub>	4 <sup>1</sup> / <sub>4</sub>	1/4	4 <sup>1</sup> / <sub>2</sub>	1/8	3
3	6	5 <sup>7</sup> / <sub>8</sub>	5	1/4	4 <sup>1</sup> / <sub>2</sub>	1/8	3
3 <sup>1</sup> / <sub>2</sub>	6	6 <sup>3</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>2</sub>	1/4	4 <sup>1</sup> / <sub>2</sub>	1/8	4
4	6	6 <sup>15</sup> / <sub>16</sub>	6 <sup>1</sup> / <sub>16</sub>	1/4	4 <sup>1</sup> / <sub>2</sub>	1/8	4
5	6	8	7	1/4	4 <sup>1</sup> / <sub>2</sub>	1/8	5
6	9	9 <sup>1</sup> / <sub>2</sub>	8 <sup>3</sup> / <sub>8</sub>	3/8	6	3/16	12
8	9	11 <sup>1</sup> / <sub>2</sub>	10 <sup>3</sup> / <sub>8</sub>	3/8	6	3/16	15
10	9	13 <sup>5</sup> / <sub>8</sub>	12 <sup>1</sup> / <sub>2</sub>	1/2	6	3/16	18
12	9	15 <sup>11</sup> / <sub>16</sub>	14 <sup>9</sup> / <sub>16</sub>	1/2	6	3/16	21
14	12	17 <sup>7</sup> / <sub>16</sub>	16 <sup>1</sup> / <sub>16</sub>	1/2	8	1/4	41
16	12	19 <sup>7</sup> / <sub>16</sub>	18 <sup>1</sup> / <sub>16</sub>	1/2	8	1/4	46
18	12	21 <sup>7</sup> / <sub>16</sub>	20 <sup>1</sup> / <sub>16</sub>	1/2	8	1/4	52
20	12	23 <sup>7</sup> / <sub>16</sub>	22 <sup>1</sup> / <sub>16</sub>	5/8	8	1/4	57
24	12	27 <sup>1</sup> / <sub>2</sub>	26 <sup>1</sup> / <sub>4</sub>	5/8	8	1/4	67

**fig. 212**  
**medium pipe clamp**



**SIZE RANGE:** 2 through 30 inch.

**MATERIAL:** Carbon Steel.

**FINISH:** Black, Painted, or Galvanized.

**SERVICE:** Pipe clamp for figure numbers, 280, 435, 436 and 437 slides and anchors.

**ORDERING:** Specify pipe size, figure number, name and finish.

pipe size	C	D	E	F	G	net wt.
1/2	3/4	1 1/8	1 <sup>21</sup> / <sub>32</sub>	5/16	1/8 x 1	.29
3/4	3/4	1 <sup>3</sup> / <sub>16</sub>	1 <sup>23</sup> / <sub>32</sub>	5/16	1/8 x 1	.33
1	3/4	1 <sup>1</sup> / <sub>4</sub>	1 <sup>25</sup> / <sub>32</sub>	5/16	1/8 x 1	.35
1 1/4	3/4	1 <sup>5</sup> / <sub>16</sub>	1 <sup>27</sup> / <sub>32</sub>	5/16	1/8 x 1	.38
1 1/2	3/4	1 <sup>5</sup> / <sub>8</sub>	2 <sup>5</sup> / <sub>32</sub>	5/16	1/8 x 1	.43
2	3/4	2 <sup>1</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>4</sub>	1/2	1/4 x 1	1.1
2 1/2	3/4	2 <sup>5</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>4</sub>	1/2	1/4 x 1	1.2
3	3/4	2 <sup>15</sup> / <sub>16</sub>	3 <sup>9</sup> / <sub>16</sub>	1/2	1/4 x 1	1.4
3 1/2	3/4	3 <sup>3</sup> / <sub>16</sub>	3 <sup>13</sup> / <sub>16</sub>	1/2	1/4 x 1	1.5
4	3/4	3 <sup>3</sup> / <sub>8</sub>	4 <sup>3</sup> / <sub>8</sub>	5/8	1/4 x 1 1/4	2.3
5	3/4	4 <sup>3</sup> / <sub>16</sub>	4 <sup>15</sup> / <sub>16</sub>	5/8	1/4 x 1 1/4	2.6
6	1	5	5 <sup>7</sup> / <sub>8</sub>	3/4	3/8 x 1 1/2	5.4
8	1	6 <sup>1</sup> / <sub>8</sub>	7	3/4	3/8 x 1 1/2	6.5
10	1 1/4	7 <sup>7</sup> / <sub>16</sub>	8 <sup>9</sup> / <sub>16</sub>	7/8	1/2 x 2	13.6
12	1 1/4	8 <sup>7</sup> / <sub>16</sub>	9 <sup>9</sup> / <sub>16</sub>	7/8	1/2 x 2	15.2
14	1 1/4	9 <sup>1</sup> / <sub>4</sub>	10 <sup>5</sup> / <sub>8</sub>	7/8	1/2 x 2 1/2	20.5
16	1 1/4	10 <sup>1</sup> / <sub>4</sub>	11 <sup>5</sup> / <sub>8</sub>	7/8	1/2 x 2 1/2	22.3
18	1 1/4	11 <sup>5</sup> / <sub>8</sub>	13	1	5/8 x 2 1/2	31.6
20	1 1/2	12 <sup>3</sup> / <sub>4</sub>	14 <sup>1</sup> / <sub>8</sub>	1 1/8	5/8 x 2 1/2	35.8
24	1 1/2	15 <sup>1</sup> / <sub>4</sub>	16 <sup>7</sup> / <sub>8</sub>	1 1/4	5/8 x 3	53.1
30	2	19	21 <sup>1</sup> / <sub>8</sub>	1 3/4	3/4 x 4	113.9

**SLIDE CONFIGURATION**



FIGURE 257  
TYPE 1

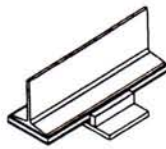


FIGURE 257  
TYPE 2

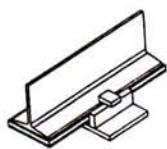


FIGURE 257  
TYPE 3



FIGURE 257  
TYPE 4

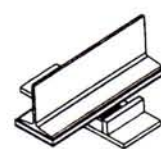


FIGURE 257  
TYPE 5

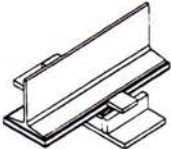


FIGURE 257  
TYPE 6



FIGURE 436  
TYPE 1

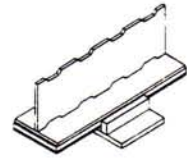


FIGURE 436  
TYPE 2

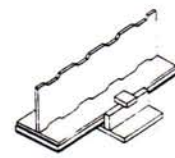


FIGURE 436  
TYPE 3



FIGURE 436  
TYPE 4

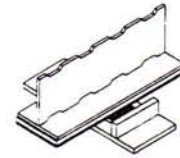


FIGURE 436  
TYPE 5

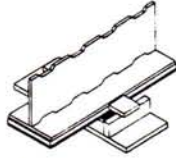


FIGURE 436  
TYPE 6

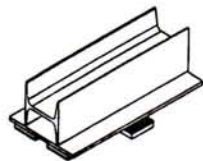


FIGURE 439  
TYPE 1

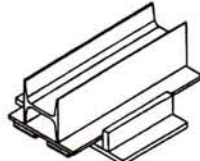


FIGURE 439  
TYPE 2

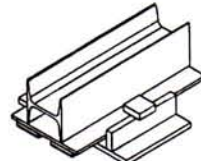


FIGURE 439  
TYPE 3

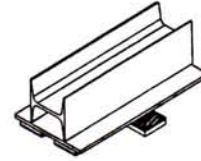


FIGURE 439  
TYPE 4

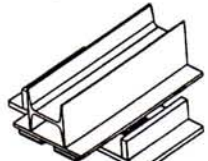


FIGURE 439  
TYPE 5

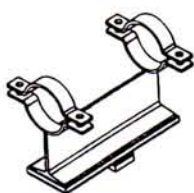


FIGURE 257 TYPES 1-6  
WITH 212 CLAMPS

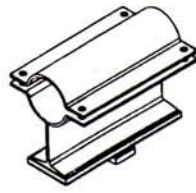


FIGURE 257 TYPES 1-6  
WITH 432 CLAMP

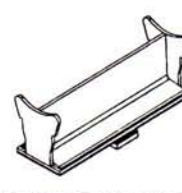


FIGURE 257 TYPES 1-6  
WITH ENDPLATES



FIGURE 257 TYPES 1-6  
WITH 212 CLAMP  
AND ENDPLATES

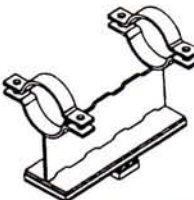


FIGURE 436 TYPES 1-6  
WITH 212 CLAMPS

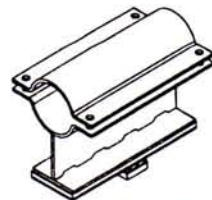


FIGURE 436 TYPES 1-6  
WITH 432 CLAMP

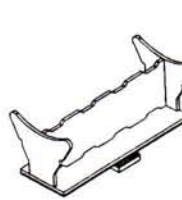


FIGURE 436 TYPES 1-6  
WITH ENDPLATES

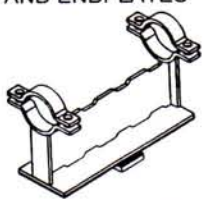


FIGURE 436 TYPES 1-6  
WITH 212 CLAMP  
AND ENDPLATES

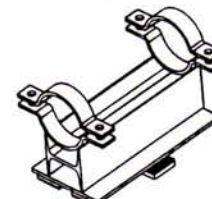


FIGURE 439 TYPES 1-5  
WITH 212 CLAMPS

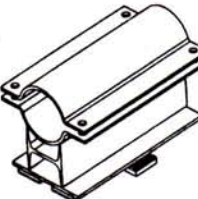


FIGURE 439 TYPES 1-5  
WITH 432 CLAMP

**ANCHOR CONFIGURATION**



FIGURE 257A



FIGURE 257A  
WITH 212 CLAMPS



FIGURE 257A  
WITH 432 CLAMP



FIGURE 257A  
WITH ENDPLATES

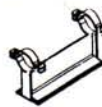


FIGURE 257A  
WITH ENDPLATES  
AND 212 CLAMPS



FIGURE 436A



FIGURE 436A  
WITH 212 CLAMPS

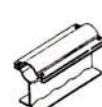


FIGURE 436A  
WITH 432 CLAMP



FIGURE 436A  
WITH ENDPLATES



FIGURE 436A  
WITH ENDPLATES  
AND 212 CLAMPS



FIGURE 439A



FIGURE 439A  
WITH 212 CLAMPS

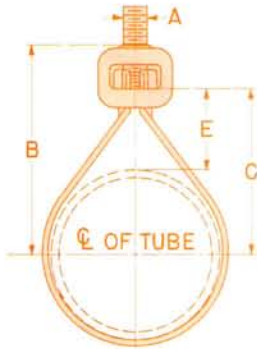


FIGURE 439A  
WITH 432 CLAMP

# Grinnell

## copper tubing hangers

### adjustable tubing ring fig. CT-99



plastic coated:  
fig. CT-99C

**SIZE RANGE:** 1/2 to 4 inch copper tubing.

**MATERIAL:** Carbon steel ring and malleable iron adjusting nut, with copper colored finish.

**APPROVALS:** Complies with Federal Specification WW-H-171E (Type 9) and Manufacturers Standardization Society SP-69 (Type 9).

**INSTALLATION:** Full load carrying capacity is reached when the rod is screwed to the bottom of the opening in the nut.

**FEATURES:**

- Large sight hole provides means of assuring thread engagement.
- Sized for copper tubing.
- Greater vertical adjustability.
- Nut may be attached to rod before pipe is picked up in band and snapped into position.
- Competitively priced.

**ORDERING:** Specify nominal tubing size, figure number, name.

### fig. CT-99C coated adjustable tubing ring

**SIZE RANGE:** 1/2 to 4 inch copper tubing.

**MATERIAL:** Carbon steel ring and malleable iron adjusting nut both with copper finish with steel band plastic coated.

**FEATURE:**

- Eliminates possibility of galvanic action between hanger and copper tubing.

**ORDERING:** Specify nominal tubing size, figure number, name.

loads • weights • dimensions (inches)

nominal tubing size	maximum recommended load, lb	weight (approx) lbs each	A	B	C	adjustment E
1/2	400	.14	3/8	2 1/2	1 3/4	1 7/16
3/4	400	.15	3/8	2 5/8	1 7/8	1 7/16
1	400	.15	3/8	2 3/4	2	1 7/16
1 1/4	400	.16	3/8	3	2 1/4	1 9/16
1 1/2	400	.17	3/8	3 1/8	2 3/8	1 9/16
2	400	.17	3/8	3 5/16	2 9/16	1 1/2
2 1/2	650	.33	1/2	3 3/8	3	1 11/16
3	650	.36	1/2	4 1/4	3 3/8	1 13/16
4	650	.41	1/2	5 1/16	4 3/16	2 1/8

copper finish

## split tubing ring ring only: fig. CT-109



**SIZE RANGE:** 1/2 to 3 inch copper tubing.

**MATERIAL:** Malleable iron with copper colored finish.

**APPROVALS:** Complies with Federal Specification WW-H-171E (Type II), and Manufacturers Standardization Society SP-69 (Type II).

**SERVICE:** The split tubing ring fig. CT-109 is used for suspension of tubing on many installations where it is necessary to specify universally adaptable parts. May be used with rod socket fig. 110R or turnbuckle adjuster fig. 114.

**ORDERING:** Specify nominal tubing size, figure number, name.

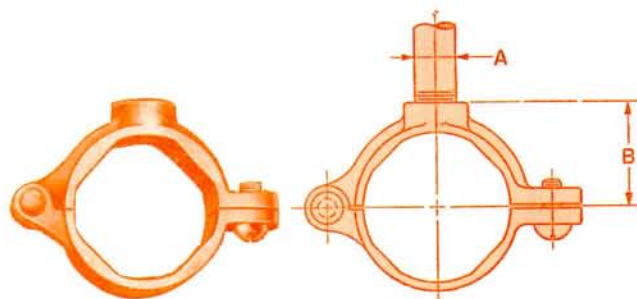
### loads • weights

nom tubing size	max recom load, lb	weight (approx) lbs each
1/2	200	.07
3/4	300	.09
1	300	.12
1 1/4	300	.13
1 1/2	300	.18
2	300	.24
2 1/2	450	.35
3	450	.46

### dimensions (inches)

nominal tubing size	C	bolt size
1/2	3/4	#10-32 x 3/4
3/4	7/8	1/4 x 1
1	1 1/8	1/4 x 1
1 1/4	1 1/4	1/4 x 1
1 1/2	1 3/8	1/4 x 1
2	1 11/16	1/4 x 1 1/4
2 1/2	1 15/16	1/4 x 1 1/4
3	2 1/4	1/4 x 1 1/4

## extension split tubing clamp rod threaded: fig. CT-138R



**SIZE RANGE:** 1/2 to 2 inch copper tubing.

**MATERIAL:** Malleable iron with copper colored finish.

**APPROVALS:** Complies with Federal Specification WW-H-171E (Type 25) and Manufacturers Standardization Society SP-69 (Type 12).

### INSTALLATION:

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

### FEATURES:

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

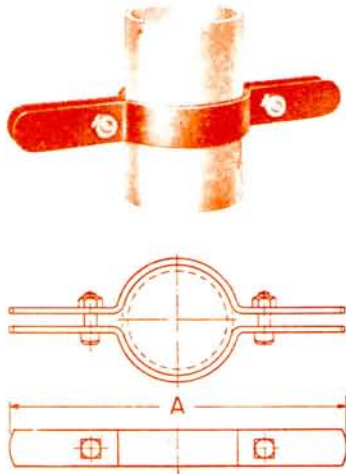
**ORDERING:** Specify nominal tubing size, figure number, name.

### loads • weights • dimensions (inches)

nom tubing size	max recom load, lb	weight (approx) lbs each	tapped for rod size A	B
1/2	180	.10	3/8	3/4
3/4	180	.12	3/8	7/8
1	180	.14	3/8	1
1 1/4	180	.18	3/8	1 1/8
1 1/2	180	.22	3/8	1 1/4
2	180	.36	3/8	1 9/16

# Grinnell

## copper tubing riser clamp fig. CT-121



**SIZE RANGE:** 1/2 to 4 inch copper tubing.

**MATERIAL:** Carbon steel with copper colored finish.

**APPROVALS:** Complies with Federal Specification WW-H-171E (Type 8) and Manufacturers Standardization Society SP-69 (Type 8).

**SERVICE:** For support and steadying of copper tubing risers.

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

**FEATURES:** Rounded ears provide greater safety for personnel.

**ORDERING:** Specify nominal tubing size, figure number, name.

## fig. CT-121C coated copper tubing riser clamp

**SIZE RANGE:** 1/2 to 4 inch copper tubing.

**MATERIAL:** Copper finished carbon steel with formed portion plastic coated.

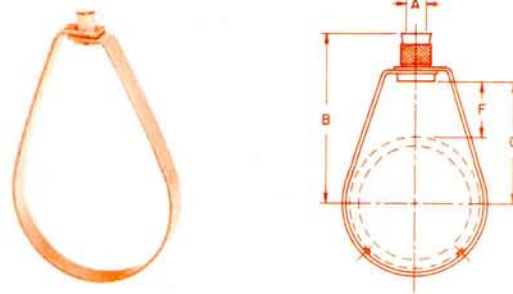
**FEATURES:** Eliminates possibility of galvanic action between hanger and copper tubing.

**ORDERING:** Specify nominal tubing size, figure number, name.

### loads • weights • dimensions (inches)

nom tubing size	max recom load, lb	weight (approx) lbs each	A	size stock	size bolts
1/2	75	.52	6 1/2	1/8 x 1	5/16 x 1
3/4	75	.56	7	1/8 x 1	5/16 x 1
1	120	.94	9 3/8	1/8 x 1 1/4	3/8 x 1 1/4
1 1/4	150	.98	9 5/8	1/8 x 1 1/4	3/8 x 1 1/4
1 1/2	150	1.5	10	3/16 x 1 1/4	3/8 x 1 1/2
2	150	1.5	10 3/8	3/16 x 1 1/4	3/8 x 1 1/2
2 1/2	300	1.7	11	3/16 x 1 1/4	3/8 x 1 1/2
3	300	1.8	11 1/2	3/16 x 1 1/4	3/8 x 1 1/2
3 1/2	300	1.9	12	3/16 x 1 1/4	3/8 x 1 1/2
4	300	2.6	13	3/16 x 1 1/2	1/2 x 1 1/2

## adjustable swivel ring fig. CT-69



**SIZE RANGE:** 1/2 to 4 inch.

**MATERIAL:** Steel with copper colored finish.

**APPROVALS:** Complies with Federal Specification WW-H-171E (Type 10) and Manufacturers Standardization Society SP-69 (Type 10).

### FEATURES:

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

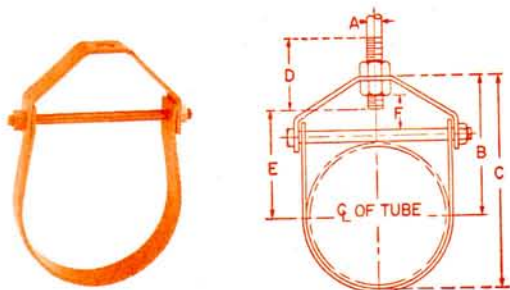
**ORDERING:** Specify nominal tubing size, figure number, name.

### loads • weights • dimensions (inches)

nom tubing size	max recom load, lb	weight (approx) lbs each	A	B	C	F
1/2	300	.09	3/8	2 7/16	1 1/2	1 3/16
3/4	300	.09	3/8	2 5/16	1 3/8	1 5/16
1	300	.10	3/8	2 5/16	1 7/16	1 5/16
1 1/4	300	.10	3/8	2 1/2	1 9/16	1 5/16
1 1/2	300	.10	3/8	2 11/16	1 13/16	1
2	300	.11	3/8	3 7/16	2 1/2	1 1/2
2 1/2	525	.25	1/2	3 13/16	2 15/16	1 11/16
3	525	.27	1/2	4 1/4	3 3/8	1 7/8
4	650	.48	1/2	4 3/8	3 1/2	1 1/2

## copper tubing hangers

### lightweight adjustable clevis fig. CT-65



See note on page 12.

**SIZE RANGE:** 1/2 to 4 inch copper tubing.

**MATERIAL:** Carbon steel with copper colored finish.

**APPROVALS:** Complies with Federal Specification WW-H-171 Latest Edition (Type 12).

**INSTALLATION:**

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

**FEATURES:** Provides for adjustment up to 1 7/8 inches.

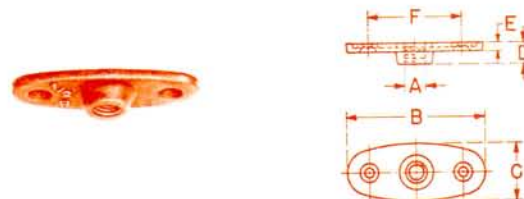
**ORDERING:** Specify nominal tubing size, figure number, name.

**loads-weights-dimensions**

nominal tube size	maximum recomd. load, lbs	weight (approx) lbs each	size of steel	
			upper	lower
1/2	150	0.09	#18 U.S. Gauge	#18 U.S. Gauge
3/4	150	0.1	X 5/8	X 5/8
1	250	0.17		
1 1/4	250	0.18	#14 U.S. Gauge	#16 U.S. Gauge
1 1/2	250	0.21	X 3/4	X 3/4
2	250	0.26		
2 1/2	350	0.48	#12 U.S. Gauge	#14 U.S. Gauge
3	350	0.55	X 1	X 1
4	400	0.6		

nominal tube size	A	B	C	D	rod take out E	adjustment F
1/2	3/8	1 1/2	1 27/32	1 7/16	1 1/16	5/16
3/4	3/8	1 11/16	2 2/32	1 9/16	1 1/4	7/16
1	3/8	1 7/8	2 13/32	1 5/8	1 7/16	1/2
1 1/4	3/8	2 5/32	2 13/16	1 3/4	1 11/16	5/8
1 1/2	3/8	2 17/32	3 3/8	1 15/16	2 1/16	13/16
2	3/8	3 11/32	4 17/32	2 5/16	2 7/8	1 3/16
2 1/2	1/2	3 27/32	5 5/32	2 3/4	3 1/4	1 5/16
3	1/2	4 15/32	6 7/32	3	3 7/8	1 3/8
4	1/2	4 31/32	6 31/32	3 1/4	4 3/8	1 7/8

### ceiling flange rod threaded fig. CT-128R



**MATERIAL:** Malleable iron with copper colored finish.

**ORDERING:** Specify rod tapping size, figure number, name.

**loads • weights • screws**

tapped rod size A	max recom load, lb	weight (approx) lbs each	screws	
			quan	size no.
3/8	180	.16	2	12
1/2	180	.16	2	12

**dimensions (inches)**

tapped rod size A	B	C	D	E	F
3/8	3 5/16	1 3/8	1/2	3/16	2 1/4
1/2	3 5/16	1 3/8	1/2	3/16	2 1/4

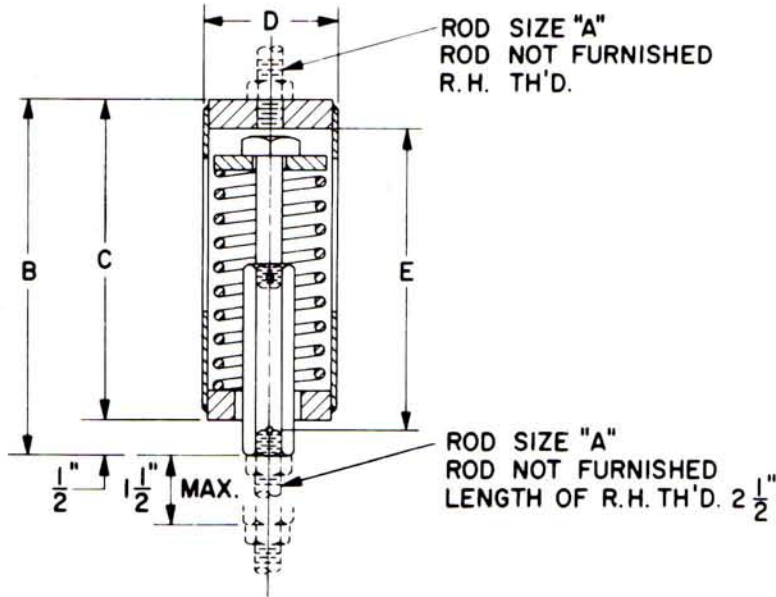
# Grinnell

## spring hangers

light-duty spring hanger

fig. 247

corrosion resistant: fig. C-247



**SERVICE:** Recommended for light loads where vertical movement does not exceed 1¼ inches.

**APPROVALS:** Complies with Federal Specification WW-H-171 E (Type 49) and Manufacturers Standardization Society SP-69 (Type 48).

**INSTALLATION:** Designed for attachment to its supporting member by screwing a rod into the top cap of the hanger the full depth of the cap.

### FEATURES:

- All welded construction.
- Neat, sturdy appearance.
- Incorporates a convenient load coupling to facilitate proper adjustment during erection.
- Available from stock.

**ORDERING:** Specify size of hanger, figure number, name. If corrosion-resistant hanger, fig. C-247, is required, specify "galvanized with neoprene coated spring" (for protection against severe weather conditions or moderate corrosive conditions) or "completely neoprene coated" (for highly corrosive conditions).

### loads • weights • dimensions (inches)

size no. max	max recom deflection*	load, lb at max recom deflection	deflection rate of hanger lb per inch	weight (approx) lb, each	rod size A	shipping length B	casing length C	casing diam D	rod take-out E
1	1¼	47.5	38	1.4	¾	4⅝	4⅞	1¾	4¼
2	1¼	85.0	68	1.6	¾	5 <sup>19</sup> / <sub>32</sub>	5 <sup>3</sup> / <sub>32</sub>	1¾	5¼
3	1¼	150.0	120	3.1	½	5 <sup>11</sup> / <sub>16</sub>	5 <sup>3</sup> / <sub>16</sub>	2½	5¼
4	1¼	267.0	214	4.5	½	7¼	6¾	2½	6 <sup>13</sup> / <sub>16</sub>

\* At maximum recommended deflection, spring can be compressed an additional ¼ inch before becoming solid.



fig. B-268, 82, 98, triple, and quadruple  
corrosion resistant: fig. C-268, C-82, C-98  
triple - CR and quadruple - CR



268

#### DESIGN FEATURES:

- Precompression.  
Precompressing the spring into the hanger casing provides the following advantages:
  - (1) Saves up to 50% in headroom by reducing the length of the hanger.
  - (2) Reduces the installed height of the overall hanger assembly.
  - (3) Prevents the spring supporting force from exceeding the normal safe limits of variation.
  - (4) Saves valuable erection time because spring is precompressed to within 1/2 inch of the working range.
- Calibration: All Grinnell spring hangers and supports are calibrated for accurate loading conditions.
- Load indicator is clearly seen in the slot, simplifying reading of the scale plate.
- Cold set at the factory upon request.
- Spring and casing are fabricated of steel and are rugged and compact.
- Piston cap serves as a centering device or guide maintaining spring alignment.
- Casing protects the spring from damage and weather conditions.

**STANDARD FINISH:** Painted with semi-gloss primer.

#### corrosion resistant:

Grinnell offers corrosion-resistant and weather-resistant pre-engineered variable spring hangers to fill vital needs in the chemical and refinery industries as well as in modern outdoor power plant construction.

Grinnell offers a choice:

- (1) For protection against severe weather conditions or moderate corrosive conditions, the parts of the hanger are galvanized per ASTM specification A-153, except the spring which is neoprene coated and the load column for Type F which is electro-galvanized.
- (2) For highly corrosive conditions, all parts of the hanger, including the spring, are neoprene coated.

#### ADVANTAGES OF NEOPRENE COATING:

- Protects from a wide range of corrosives.
- Does not affect the flex life of the spring.
- Recommended for ambient temperatures up to 225°F.

**SPECIFICATIONS:** Grinnell pre-engineered spring hangers are designed to meet the requirements of the ASME Code for Pressure Piping (ASME B31.1.0) and MSS-SP-58. All welding is done in strict accordance with ASME Section IX.

**SIZE RANGE:** The Grinnell pre-engineered Variable Spring Hanger in five series and seven types is offered in twenty-three sizes (fig. 268 only is offered in twenty-five sizes). The hanger can be furnished to take loads from fifty pounds (fig. 268 from ten pounds) to fifty thousand and ten pounds.

**RECOMMENDED SERVICE:** Pipe hangers located at points that are subject to vertical thermal movement and for which a constant support hanger is not required (see "recommended service" for constant support hanger, page ph-126. Type D & E Spring Hangers may accommodate less than 4° of rod swing depending on size, fig. number, and application.

**APPROVALS:** Complies with Federal Specification WW-H-171E (Types 51, 56 and 57) and Manufacturers Standardization Society SP-69 (Types 51, 52 and 53).

**INSTALLATION:** Securely attach hanger to the building. Attach lower hanger rod and turn the load coupling until the load indicator is positioned at the desired setting indicated on the load scale plate.

**ADJUSTMENT OF HANGER:** Once installed in the line; the hanger should be adjusted until the load indicator moves to the white button marked "C" (cold position). On inspection of the system, after a reasonable period of operation, the load indicator should be at the red button marked "H" (hot position). If it is not, the hanger should be readjusted to the hot position. No other adjustment is necessary.

**HOW TO DETERMINE SERIES:** In choosing between the variable spring hangers, it must first be determined that the calculated movement will fall within the working load range of the hanger.

The fig. 82 hanger has a maximum variation in supporting force per 1/2 inch spring deflection of 21 percent of its mid range load. The Fig. B-268 has a maximum variation of 10 1/2 percent, while the fig. 98 has a maximum variation of only 5 1/4 percent. It is clear, then, that the longer spring causes the least transfer of load, and that shear ability to get the known movement within the spring hanger's working range is *not* the complete answer to the problem. Rather, good engineering sense, combined with available space and reasonable economic considerations should ultimately determine which series of variable spring hangers should be used.

## spring hangers

fig. B-268, 82 and 98

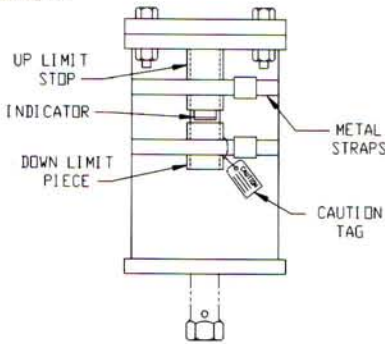
corrosion resistant: fig. C-268, C-82 and C-98

**HOW TO DETERMINE TYPE:** The type of variable spring hanger to be used depends upon the physical characteristics required by the suspension problem; i.e., amount of head room, whether pipe is to be supported above the spring or below the spring, etc. Consideration should be given to the seven standard types offered (see line cuts of types "A" through "G"). Special variable spring hangers can be fabricated for unusual conditions.

**HOW TO DETERMINE SIZE:** Complete sizing information is given above the hanger section chart on page ph-105. This information is applicable to sizing hangers of all series.

It will be noted on the hanger selection charts that the total spring deflection in the casing leaves a reserve above and below the recommended working load range.

### TRAVEL STOP:



The functional design of the pre-compressed variable spring hanger permits the incorporation of a two-piece travel stop that locks the hanger spring against upward or downward movement for temporary conditions of underload or overload. The complete travel stop, the up limit stop only for cold set purposes or the down limit stop only which may be employed during erection, hydrostatic test (Grinnell permits a hydrostatic test load of 2 times the normal operating load for the spring hanger) or chemical cleanout will be furnished only when specified. The travel stop is painted red and is installed at the factory with a caution tag attached calling attention that the device must be removed before the pipe line is put in service.

**ORDERING:** (1) Size; (2) type; (3) figure number; (4) name of hanger; (5) desired supporting force in operating position; (6) calculated amount and direction of pipe movement from installed to operating position; (7) Customer's identification number (if any); (8) when ordering Type F Spring specify if load flange or flange with roller is to be furnished; (9) when ordering Type G, specify total load and load per spring plus center to center rod dimensions. (10) if required, specify with travel stop, up limit stop or down limit stop. specify with lifting lugs, if required. (11) When ordering corrosion resistant, specify C-268; C-82, C-98, Triple CR, or Quadruple - CR "completely galvanized except neoprene coated spring" or "completely neoprene coated."

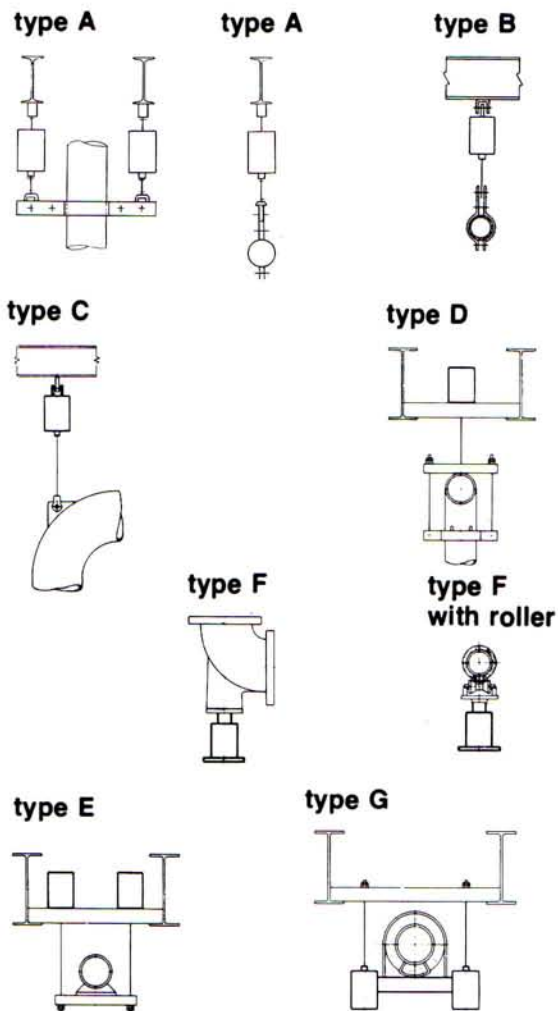
To help alleviate the problem of lifting large size spring hangers into position for installation, this product is available with lifting lugs (if requested) on sizes weighing one hundred pounds or more.

### dimension "A" (inches)

hanger size	fig. 82	fig. B-268	fig. 98
9 thru 11	4 $\frac{5}{8}$ ●	5 $\frac{7}{8}$ ●	9 $\frac{1}{4}$ ◆
12 thru 14	4 $\frac{5}{8}$ ●	5 $\frac{7}{8}$ ◆	9 $\frac{1}{4}$
15 thru 17	4 $\frac{7}{8}$ ◆	6 $\frac{1}{8}$	9 $\frac{1}{2}$
18 thru 20	5 $\frac{3}{8}$	6 $\frac{3}{8}$	10
21 thru 22	5 $\frac{7}{8}$	7 $\frac{1}{8}$	10 $\frac{3}{8}$

- Type G only.
- ◆ Types F and G only.

### typical applications

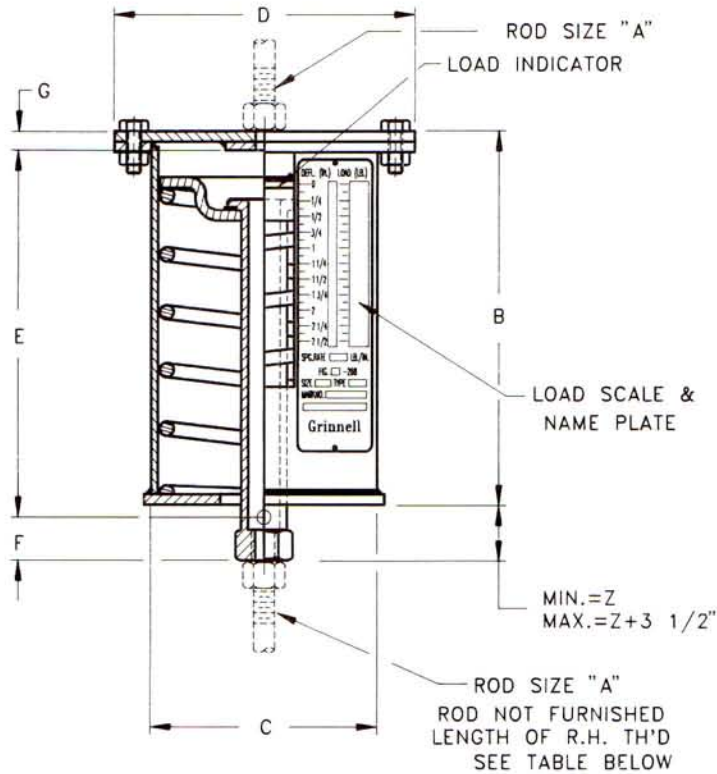




# Grinnell

## spring

fig. B-268:  
type A  
fig. C-268:



Type A is the basic unit of fig. B-268 Grinnell *Pre-Engineered* spring hanger. It is designed for attachment to its supporting member by screwing a rod into a tapped hole in the top cap of the hanger the full depth of the top cap ("G" dimension). The upper jam nut should then be

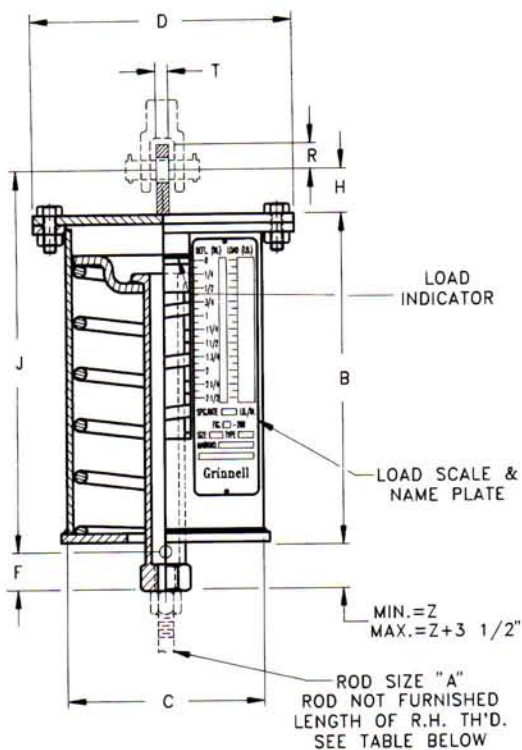
locked, securing the hanger. Adjustment of the hanger load is accomplished by turning the coupling on the lower hanger rod until the hanger picks up the load and the load indicator points to the desired position.

### weights • dimensions (inches)

hanger size	weight (approx) each, lb	rod size A	R.H. thread length	casing length B	casing diam C	flange diam D	rod take-out E	min thd engagement F	thread depth G	Z
000	5	1/2	5	5 5/8	4	5 1/8	5 1/16		7/16	13/16
00	6	1/2	5	7 9/16	4	5 1/8	7 3/8	15/16	7/16	13/16
0	8	1/2	5	6 11/16	4	5 1/8	6 1/16		7/16	3/4
1	8	1/2	5	7 9/16	4	5 1/8	6 15/16	15/16	7/16	3/4
2	9	1/2	5	8 5/16	4	5 1/8	7 15/16		7/16	1
3	14	1/2	5	7 15/16	5 9/16	6 15/16	7 9/16		7/16	1
4	15	1/2	5	7 15/16	5 9/16	6 15/16	7 15/16	15/16	7/16	1 3/8
5	16	1/2	5	8 5/8	5 9/16	6 15/16	7 15/16		7/16	1 1/16
6	26	5/8	5	8 13/16	6 5/8	8 3/8	7 13/16		5/8	9/16
7	29	5/8	5	10	6 5/8	8 3/8	9 1/16	15/16	5/8	5/8
8	31	5/8	5	10	6 5/8	8 3/8	9 1/16		5/8	5/8
9	65	3/4	6	10 7/16	8 5/8	10 3/4	8 15/16		1	3/4
10	71	3/4	6	12 1/8	8 5/8	10 3/4	11 3/8	1 1/4	1	1 1/2
11	65	3/4	6	10 7/16	8 5/8	10 3/4	9 7/8		1	1 11/16
12	71	1	6	10 7/16	8 5/8	10 3/4	9 1/2		1	1 1/16
13	89	1	7	13 1/8	8 5/8	10 3/4	11 3/8	1 1/4	1	1/2
14	93	1 1/4	7	13 1/4	8 5/8	10 3/4	11 3/8		1 1/4	3/8
15	111	1 1/4	7	13 1/4	8 5/8	10 3/4	11 3/8		1 1/4	1 7/8
16	133	1 1/2	8	16 1/16	8 5/8	11 3/8	14 13/16	1 15/16	1 3/8	2 1/16
17	162	1 3/4	8	18 1/8	8 5/8	11 3/8	16 3/4		1 3/8	1 15/16
18	330	2	9	18 1/4	12 3/4	15 7/8	16		2 1/4	2 9/16
19	376	2 1/4	9	20 1/2	12 3/4	15 7/8	18 3/8	2 3/4	2 1/4	2 11/16
20	480	2 1/2	10	23 3/4	12 3/4	15 7/8	21 1/8		2 1/4	2 11/16
21	556	2 3/4	10	27 9/16	12 3/4	16 7/8	23 7/8	3 3/8	2 3/4	3 11/16
22	705	3	11	33 3/8	12 3/4	16 7/8	29 3/4		3	3 3/4

## spring hangers

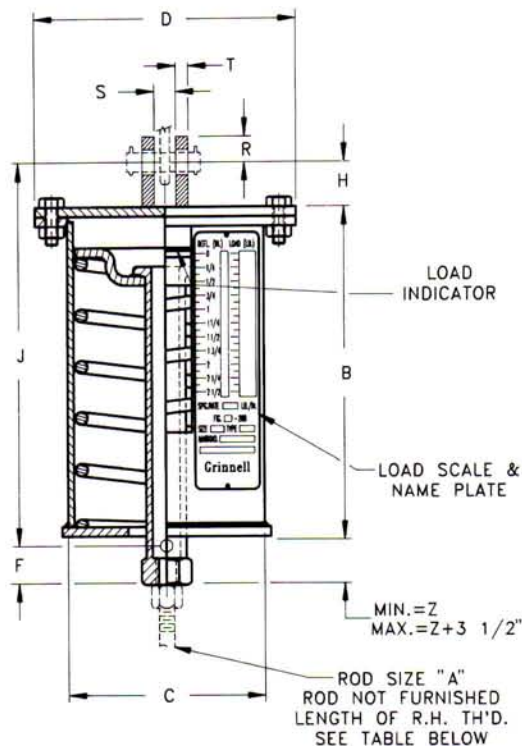
fig. B-268:  
type B  
fig. C-268:



Type B is furnished with a single lug for attachment to the building structure. The lug permits use of a clevis or a pair of angles for attachment where headroom is limited.

## spring hangers

fig. B-268:  
type C  
fig. C-268:



Type C is furnished with two lugs for attachment to the building structure. These two lugs permit the use of an eye rod or a single plate for attachment where headroom is limited.

### weights • dimensions (inches)

hanger size	wgt (approx) each lb	rod size A	R.H. thd lgth	lug hole size	casing length B	casing diam C	flange diam D	min thd engagement F	height of pin H	rod take out J	R	clevis opening S	thick ness T	Z
000	5	1/2	5	11/16	5 5/8	4	5 5/8		1 1/2	7	1 1/4	7/8	1/4	13/16
00	6	1/2	5	11/16	7 9/16	4	5 5/8	15/16	1 1/2	9 1/2	1 1/4	7/8	1/4	13/16
0	8	1/2	5	11/16	6 11/16	4	5 5/8		1 1/2	8	1 1/4	7/8	1/4	3/4
1	9	1/2	5	11/16	7 9/16	4	5 5/8	15/16	1 1/2	8 7/8	1 1/4	7/8	1/4	3/4
2	10	1/2	5	11/16	8 5/16	4	5 5/8		1 1/2	9 7/8	1 1/4	7/8	1/4	1
3	14	1/2	5	11/16	7 15/16	5 9/16	6 15/16		1 1/2	9 1/2	1 1/4	7/8	1/4	1
4	16	1/2	5	11/16	7 15/16	5 9/16	6 15/16	15/16	1 1/2	9 7/8	1 1/4	7/8	1/4	1 3/8
5	17	1/2	5	11/16	8 5/8	5 9/16	6 15/16		1 1/2	9 7/8	1 1/4	7/8	1/4	1 1/16
6	27	3/8	5	13/16	8 13/16	6 5/8	8 3/8		1 1/2	9 15/16	1 1/4	1 1/16	1/4	9/16
7	30	3/8	5	13/16	10	6 5/8	8 3/8	15/16	1 1/2	11 3/16	1 1/4	1 1/16	1/4	5/8
8	32	3/8	5	13/16	10	6 5/8	8 3/8		1 1/2	11 3/16	1 1/4	1 1/16	1/4	5/8
9	66	3/4	6	15/16	10 7/16	8 5/8	10 3/4		1 1/2	11 7/16	1 1/4	1 1/4	3/8	3/4
10	72	3/4	6	15/16	12 3/8	8 5/8	10 3/4	1/4	1 1/2	13 3/8	1 1/4	1 1/4	3/8	1 1/2
11	66	3/4	6	15/16	10 7/16	8 5/8	10 3/4		1 1/2	12 3/8	1 1/4	1 1/4	3/8	1 11/16
12	71	1	6	1 1/4	10 7/16	8 5/8	10 3/4		2	12 1/2	1 1/2	1 5/8	1/2	1 1/16
13	89	1	7	1 1/4	13 3/8	8 5/8	10 3/4	1/4	2	14 3/8	1 1/2	1 5/8	1/2	1/2
14	94	1 1/4	7	1 1/2	13 1/4	8 5/8	10 3/4		3	15 3/8	2	2	3/8	3/8
15	114	1 1/4	7	1 1/2	13 1/4	8 5/8	10 3/4		3	14 3/8	2	2	5/8	1 7/8
16	138	1 1/2	8	1 3/4	16 1/16	8 5/8	11 3/8	1 15/16	3	19 3/16	2 1/2	2 3/8	3/4	2 1/16
17	168	1 3/4	8	2	18 1/8	8 5/8	11 3/8		3	21 1/8	2 1/2	2 5/8	3/4	1 15/16
18	331	2	9	2 3/8	18 1/4	12 3/4	15 7/8		4	22 1/8	3	2 7/8	3/4	2 9/16
19	378	2 1/4	9	2 5/8	20 1/2	12 3/4	15 7/8	2 3/4	4 1/2	25	3	3 1/8	3/4	2 11/16
20	486	2 1/2	10	2 7/8	23 3/4	12 3/4	15 7/8		4 1/2	28 1/4	4	3 3/8	1	2 11/16
21	568	2 3/4	10	3 3/8	27 5/16	12 3/4	16 7/8	3 5/8	4 1/2	31 1/8	4	3 5/8	1	3 11/16
22	714	3	11	3 3/8	33 3/8	12 3/4	16 7/8		5	37 3/4	4	3 7/8	1	3 3/4

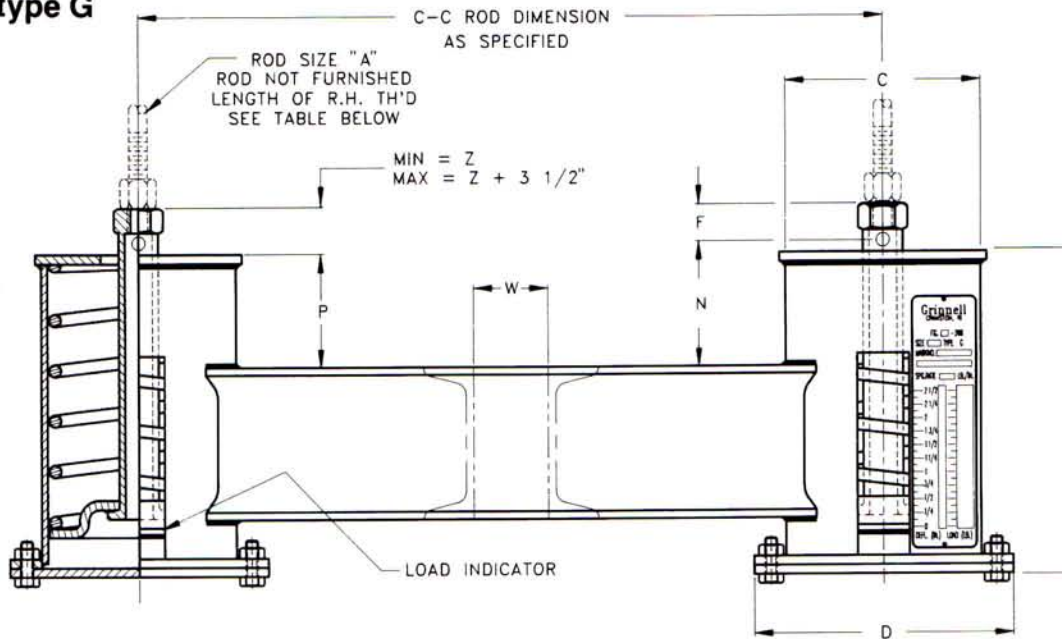
# Grinnell

## spring

fig. B-268:

fig. C-268:

type G



Type G is a complete trapeze assembly. The hanger consists of two standard spring units plus a pair of back-to-back channels welded at each end to the hanger casing.

The "P" dimension can be varied with the customer's instructions.

In sizing a Type G hanger, it must be remembered that each standard spring unit carries one-half of the total

pipe load. Therefore, in using the hanger selection chart, use one-half of the total pipe load as the hot load.

When the pipe line is designed so as not to be centered on the channel, one spring of the trapeze will carry a heavier load, the other a lighter load. Care should be taken in calculating the load of each hanger and in choosing the proper sized spring in such cases. The center-to-center rod dimension must be specified when ordering.

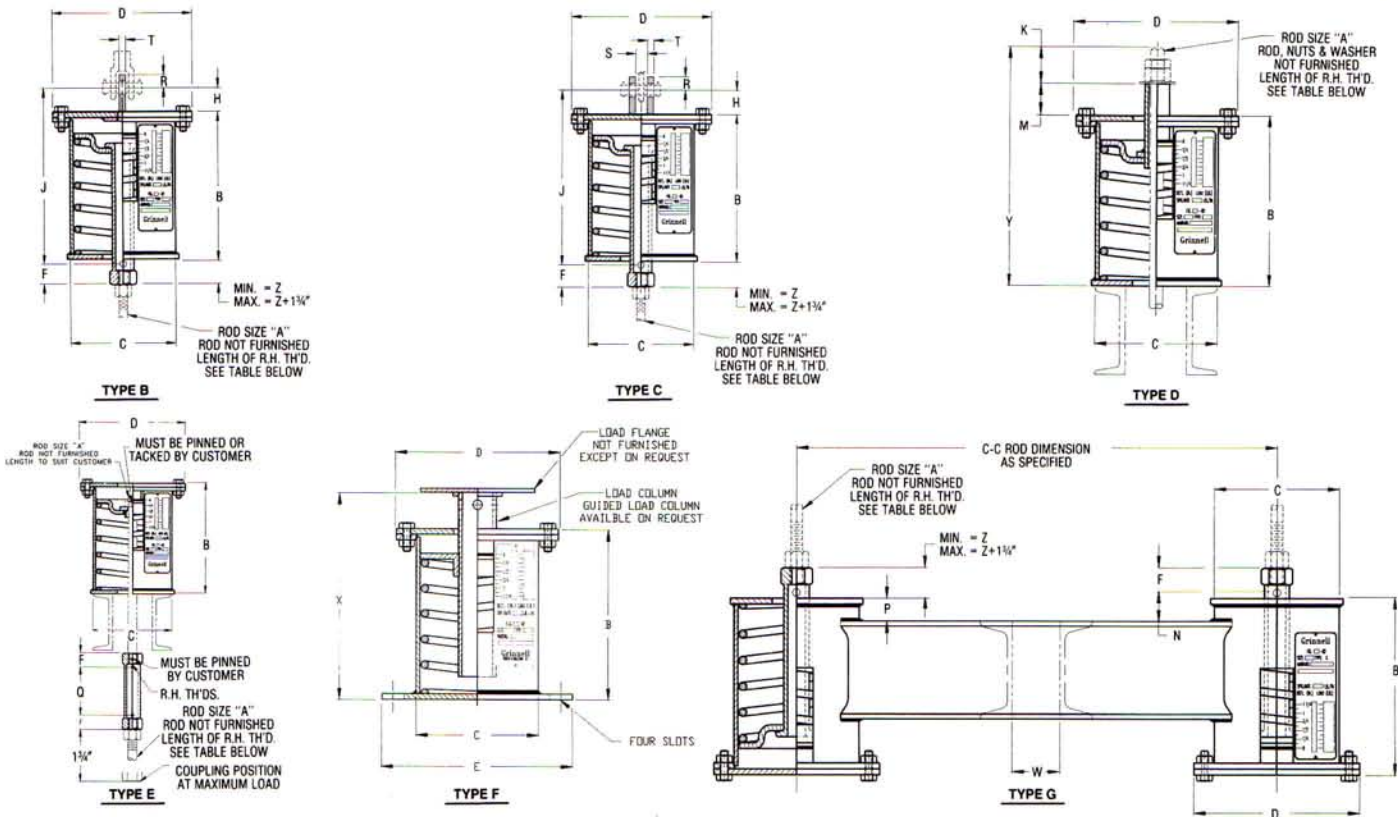
### weights • dimensions (inches)

hanger size	wgt (approx) each, lb	rod size A	R.H. thread length	casing length B	casing diameter C	flange diam D	min thread engagement F	rod take-out N	channel size	max C-C	space between channels W	P	Z
000	24	1/2	5	5 3/8	4	5 1/8							
00	26	1/2	5	7 9/16	4	5 1/8	15/16	1 3/4	C3x4.1	24	5/8	1 1/2	13/16
0	30	1/2	5	6 11/16	4	5 1/8		1 5/16			5/8	1 1/2	3/4
1	31	1/2	5	7 9/16	4	5 1/8	15/16	1 5/16	C3x4.1	24	5/8	1 1/2	3/4
2	32	1/2	5	8 5/16	4	5 1/8		1 9/16			5/8	1 1/2	1
3	41	1/2	5	7 15/16	5 9/16	6 15/16		2 1/16			3/4	2	1
4	42	1/2	5	7 15/16	5 9/16	6 15/16	15/16	2 7/16	C3x4.1	30	3/4	2	1 3/8
5	43	1/2	5	8 5/8	5 9/16	6 15/16		1 3/4			3/4	2	1 1/16
6	63	5/8	5	8 13/16	6 5/8	8 3/8		1 5/8			1	2	9/16
7	69	5/8	5	10	6 5/8	8 3/8	15/16	1 11/16	C3x4.1	36	1	2	5/8
8	73	5/8	5	10	6 5/8	8 3/8		1 11/16			1	2	5/8
9	143	3/4	6	10 7/16	8 5/8	10 3/4		2 1/2			1 1/4	3	3/4
10	157	3/4	6	12 1/8	8 5/8	10 3/4		3 1/4	C4x5.4	36	1 1/4	3	1 1/2
*11	145	3/4	6	10 7/16	8 5/8	10 3/4	1 1/4	3 7/16			1 1/4	3	1 11/16
12	157	1	6	10 7/16	8 5/8	10 3/4		3 13/16			1 1/2	4	1 1/16
*13	195	1	7	13 1/8	8 5/8	10 3/4	1 1/4	3 3/4	C5x6.7	36	1 1/2	4	1/2
*14	203	1 1/4	7	13 1/4	8 5/8	10 3/4		3 3/8			1 1/2	4	3/8
15	250	1 1/4	7	13 1/4	8 5/8	10 3/4		3 15/16	C6x10.5		2 1/8	4	1 7/8
16	298	1 1/2	8	16 1/16	8 5/8	11 3/8	1 15/16	4 1/8	C8x11.5	36	2 1/8	4	2 1/16
17	354	1 3/4	8	18 1/8	8 5/8	11 3/8		4	C8x11.5		2 1/8	4	1 15/16
18	690	2	9	18 1/4	12 3/4	15 7/8		4			2 3/8	4	2 9/16
19	783	2 1/4	9	20 1/2	12 3/4	15 7/8	2 3/4	4 1/8	C12x20.7	42	2 5/8	4	2 11/16
20	993	2 1/2	10	23 3/4	12 3/4	15 7/8		4 1/8			2 7/8	4	2 11/16
21	1197	2 3/4	10	27 5/16	12 3/4	16 7/8		4 5/16			3 1/8	4	3 11/16
22	1496	3	11	33 3/8	12 3/4	16 7/8	3 5/8	4 3/8	C15x33.9	48	3 3/8	4	3 3/4

■ Weight based on 24 inch center-to-center dimension.



fig. 82  
short spring: fig. C-82



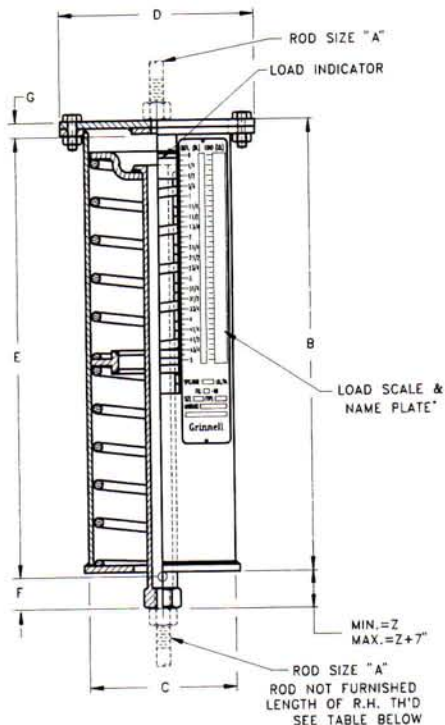
■ Hanger take-out or installed height. With pipe movement up, cold to hot, installed height should be the mid point between the minimum and maximum "X" dimension, plus thickness of load flange. With pipe movement down, cold to hot installed height should be mid-point between the minimum and maximum "X" dimension, plus the amount of vertical movement and load flange thickness. (Type F only).

• Weight based on 24 inch center-to-center dimension.  
See page ph-82 and ph-108 for type F Roller information.

hanger size	E'		type F					length X		type G				weight (approx) lb. each					
	bot- tom flange square	bottom flange bolt circle		bot- tom flange bolts	thick bot- tom flange	load col diam	load flange diam	thick. of load flange	type F		channel size	max. C-C	space between chan- nels W	P	Type A, B, C	Type D, E	type F	type G	
		min	max						min	max									
0	7 1/2	7	8 3/4	5/8	1/4	1.900		3/16	6 5/8	6 3/4									
1	7 1/2	7	8 3/4	5/8	1/4	1.900	3 3/8	3/16	6 5/8	6 3/4	C3 x 4.1	24	5/8	1	7	6	11	29	
2	7 1/2	7	8 3/4	5/8	1/4	1.900		3/16	6 3/4	7 1/8									
3	7 1/2	7 3/4	8 3/4	5/8	1/4	2.875		3/16	6 3/4	7 1/8									
4	7 1/2	7 3/4	8 3/4	5/8	1/4	2.875	5 3/8	3/16	6 3/4	7 1/8	C3 x 4.1	30	5/8	1	12	11	20	35	
5	7 1/2	7 3/4	8 3/4	5/8	1/4	2.875		3/16	7	7 3/8									
6	9	8	10 7/8	3/4	3/8	3.50		1/4	7 7/8	8									
7	9	8	10 7/8	3/4	3/8	3.50	6 3/8	1/4	8	8 3/4	C3 x 4.1	36	1	2	20	19	33	51	
8	9	8	10 7/8	3/4	3/8	3.50		1/4	8 3/4	8 3/4									
9	13 1/4	10 9/16	16 1/2	3/4	1/2	4.50		1/2	8 3/4	9 3/4									
10	13 1/4	10 9/16	16 1/2	3/4	1/2	4.50	8 3/8	1/2	9 1/4	10 1/4	C4 x 5.4	36	1 1/4	2	56	52	78	125	
11	13 1/4	10 9/16	16 1/2	3/4	1/2	4.50		1/2	8 3/4	9 3/4									
12	13 1/4	10 9/16	16 1/2	3/4	1/2	4.50		1/2	8 3/4	9 3/4									
13	13 1/4	10 9/16	16 1/2	3/4	1/2	4.50	8 3/8	1/2	10 3/4	11 3/4	C5 x 6.7	36	1 1/2	1 1/2	58	53	78	132	
14	13 1/4	10 9/16	16 1/2	3/4	1/2	4.50		1/2	10 3/4	11 3/4									
15	13 1/4	10 9/16	16 1/2	3/4	1/2	4.50		1/2	10 3/4	11 3/4	C6 x 10.5		2 1/8	1	88	79	100	198	
16	13 1/4	10 9/16	16 1/2	3/4	1/2	2.00	8 3/8	1/2	12 3/4	13 3/4	C8 x 11.5	36	2 1/8	1	102	91	112	230	
17	13 1/4	10 9/16	16 1/2	3/4	1/2	2.00		1/2	13 3/4	14 3/4	C8 x 11.5		2 1/8	2	120	105	126	266	
18	17 1/4	15 3/4	22	3/4	3/8	2.50		1/2	15 3/4	16 3/4									
19	17 1/4	15 3/4	22	3/4	3/8	2.50	12 1/2	1/2	16 3/4	17 3/4	C12 x 20.7	42	2 3/8	1	259	226	270	548	
20	17 1/4	15 3/4	22	3/4	3/8	2.50		1/2	18 3/4	19 3/4									
21	17 1/4	15 3/4	22	3/4	3/8	3.00		1/2	20 3/4	21 3/4									
22	17 1/4	15 3/4	22	3/4	3/8	3.00	12 1/2	1/2	24 3/4	25 3/4	C15 x 33.9	48	3 3/8	1	401	339	348	887	
																			1066



**double spring: fig. 98**  
**corrosion resistant: fig. C-98**



The Grinnell Pre-Engineered Double Spring Hanger, fig. 98, embodies all of the fig. 268 features, and is designed to the same exacting specifications. Each basic unit consists of two springs arranged in series within a single casing. A centering guide is provided to assure the permanent alignment of the spring assembly.

This hanger is offered in the seven basic types as shown for the fig. 268.

The load table and instructions for sizing this hanger may be found on page ph-104.

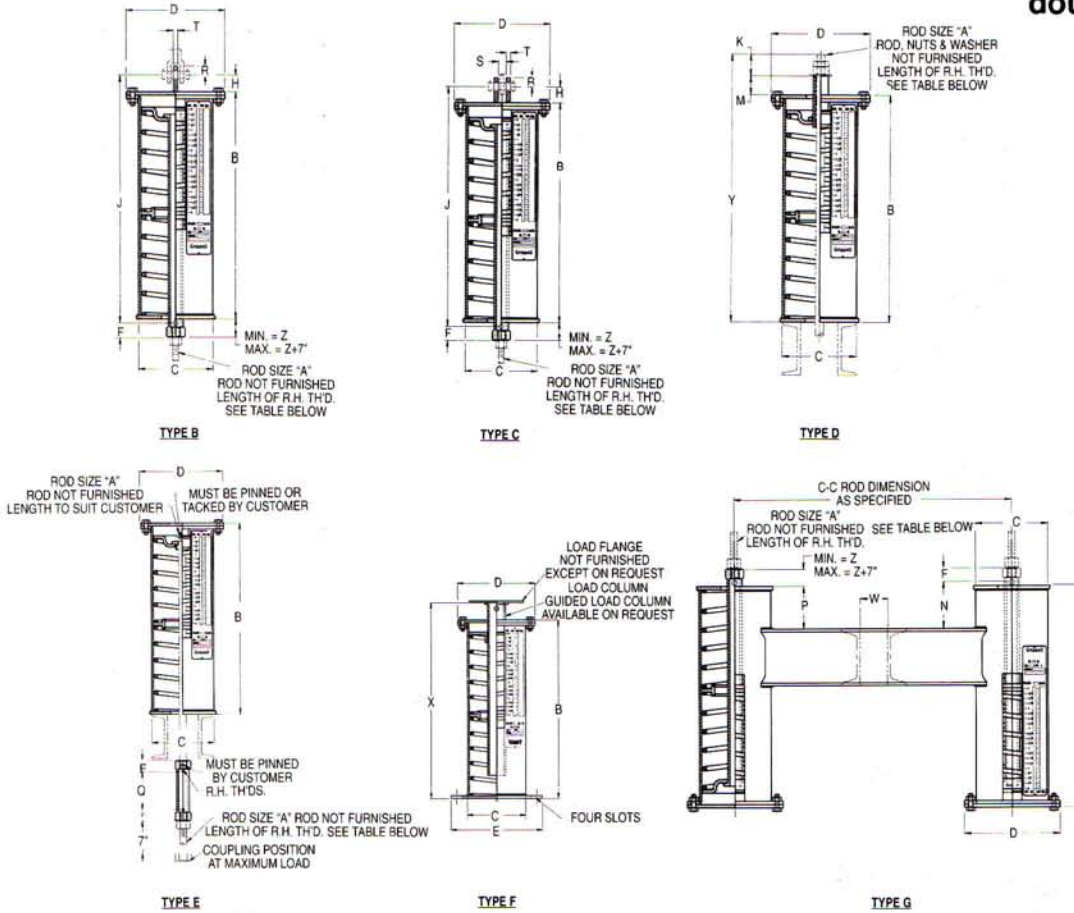
### TYPE A

**weights • dimensions (inches)**

hanger size	rod size A	R.H. th'd lgth	casing length B	casing diam C	flange diam D	min th'd engagement F	Z	rod take-out types				type A	types B, C					type D		
								E	J	Q	N	th'd depth	lug hole size	height of pin H	R	clevis opening S	thick-ness T	rod length Y	allow-ance for nuts K	height of spacer M
												G								
0	1/2	9	12 3/8	4	5 1/2	15/16	15/16	12 7/16	14 1/8	9	1 1/2	7/16	11/16	1 1/2	1 1/4	7/8	1/4	19 3/8	1 1/4	5 1/2
1	1/2	9	14 3/8	4	5 1/2	15/16	15/16	13 15/16	15 7/8	9	1 1/2	7/16	11/16	1 1/2	1 1/4	7/8	1/4	21 1/8	1 1/4	5 1/2
2	1/2	9	15 7/8	4	5 1/2	15/16	17/16	15 5/16	17 7/8	9	1 1/4	7/16	11/16	1 1/2	1 1/4	7/8	1/4	22 1/2	1 1/4	5 1/2
3	1/2	9	14	5 9/16	6 15/16	15/16	13/16	13 7/16	15 3/8	9	1 3/8	7/16	11/16	1 1/2	1 1/4	7/8	1/4	20 3/4	1 1/4	5 1/2
4	1/2	9	15 1/4	5 9/16	6 15/16	15/16	13/16	15 3/16	17 1/8	9	2 1/8	7/16	11/16	1 1/2	1 1/4	7/8	1/4	22	1 1/4	5 1/2
5	1/2	9	16 5/8	5 9/16	6 15/16	15/16	11/16	15 15/16	17 7/8	9	1 3/4	7/16	11/16	1 1/2	1 1/4	7/8	1/4	23 3/8	1 1/4	5 1/2
6	5/8	9	16 11/16	6 3/8	8 3/8	15/16	13/16	15 15/16	18 1/16	9	1 7/8	5/8	13/16	1 1/2	1 1/4	1 1/16	1/4	23 11/16	1 1/2	5 1/2
7	5/8	9	18 3/8	6 3/8	8 3/8	15/16	1 1/8	18 3/16	20 3/16	9	2 7/16	5/8	13/16	1 1/2	1 1/4	1 1/16	1/4	25 5/8	1 1/2	5 1/2
8	5/8	9	19 9/16	6 3/8	8 3/8	15/16	1 1/16	18 11/16	20 13/16	9	1 3/4	5/8	13/16	1 1/2	1 1/4	1 1/16	1/4	26 9/16	1 1/2	5 1/2
9	3/4	9	20 3/16	8 3/8	10 3/4	1 1/4	15/16	18 7/8	21 3/8	9	2 11/16	1	15/16	1 1/2	1 1/4	1 1/4	3/8	27 7/16	1 3/4	5 1/2
10	3/4	9	22 3/8	8 3/8	10 3/4	1 1/4	1	21 3/8	23 3/8	9	2 3/4	1	15/16	1 1/2	1 1/4	1 1/4	3/8	29 3/8	1 3/4	5 1/2
11	3/4	10	18 1/4	8 3/8	10 3/4	1 1/4	3/8	16 7/8	19 3/8	12	2 3/4	1	15/16	1 1/2	1 1/4	1 1/4	3/8	25 1/2	1 3/4	5 1/2
12	1	10	19 1/2	8 3/8	10 3/4	1 1/4	5/8	17 7/8	20 7/8	12	3 3/8	1	1 1/4	2	1 1/2	1 1/8	1/2	27 1/4	2 1/4	5 1/2
13	1	10	24 3/8	8 3/8	10 3/4	1 1/4	3/4	23 3/4	26 1/4	12	3 1/2	1	1 1/4	2	1 1/2	1 1/8	1/2	32 3/8	2 1/4	5 1/2
14	1 1/4	10	24 3/8	8 3/8	10 3/4	1 1/4	1/2	23 3/8	27 3/8	12	3 3/4	1	1 1/2	3	2	2	5/8	33 3/8	3	5 1/2
15	1 1/4	10	24 3/8	8 3/8	10 3/4	1 1/4	2 1/8	24 1/16	28 7/16	7	4 3/16	1 3/8	1 1/2	3	2	2	5/8	33 3/4	3	5 1/2
16	1 1/2	11	29 3/8	8 3/8	11 3/8	1 15/16	2	28 9/16	32 15/16	7	4 1/16	1 3/8	1 3/8	3	2 1/2	2 3/8	3/4	38 3/8	3 3/8	5 1/2
17	1 3/4	12	34	8 3/8	11 3/8	1 15/16	2 1/8	32 13/16	37 3/16	7	4 3/16	1 3/8	2	3	2 1/2	2 3/8	3/4	43 1/2	4	5 1/2
18	2	12	33 3/4	12 3/4	15 3/4	2 3/4	2 11/16	31 1/8	37 3/4	7	4 1/8	2 1/4	2 3/8	4	3	2 7/8	3/4	43 9/16	4 9/16	5 1/2
19	2 1/4	13	37 3/4	12 3/4	15 3/4	2 3/4	2 9/16	35 1/2	42 1/8	7	4	2 1/4	2 3/8	4 1/2	3	3 3/8	3/4	48 3/8	5	5 1/2
20	2 1/2	14	44 1/4	12 3/4	15 3/4	2 3/4	2 11/16	42 3/8	48 3/8	7	4 1/4	2 1/4	2 3/8	4 1/2	4	3 3/8	1	55 3/16	5 9/16	5 1/2
21	2 3/4	14	49 3/8	12 3/4	16 3/4	3 3/8	2 11/16	45 7/16	52 11/16	7	3 9/16	2 3/4	3 3/8	4 1/2	4	3 3/8	1	60 3/8	6 1/4	5 1/2
22	3	15	62	12 3/4	16 3/4	3 3/8	3 1/2	58 3/8	66 3/8	7	4 1/8	3	3 3/8	5	4	3 3/8	1	73 1/8	6 3/4	5 1/2

table continued

fig. 98  
double spring: fig. C-98

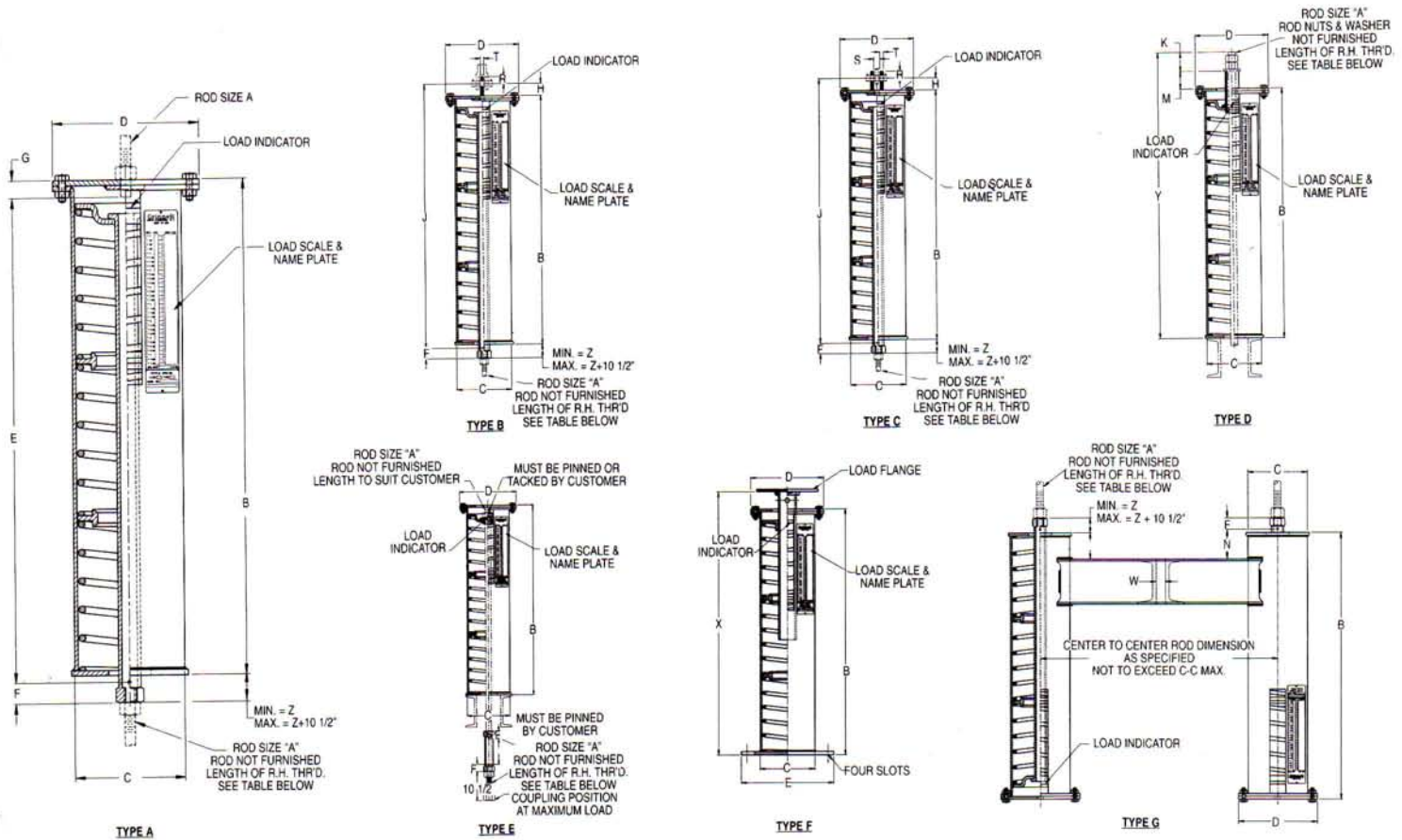


■ Hanger take-out or installed height. With pipe movement up, cold to hot, installed height should be the mid point between the minimum and maximum "X" dimension, plus thickness of load flange. With pipe movement down, cold to hot installed height should be mid-point between the minimum and maximum "X" dimension, plus the amount of vertical movement and load flange thickness. (Type F only).

• Weight based on 24 inch center-to-center dimension.  
See page ph-82 and ph-108 for type F Roller information.

hanger size	E'		type F						length X			type G				weight (approx) lb. each			
	bot- tom flange square	bottom flange bolt circle		bot- tom flange bolts	thick bot- tom flange	load col. diam	load flange diam	thick of load flange*	type F*		channel size	max. C-C	space between chan- nels W	P	Type A, B, C	Type D, E	type F	type G*	
		min	max						min	max									
0	7½	7	8¾	¾	¼	1.900		¾/16	14%	16%				12	12	20	37		
1	7½	7	8¾	¾	¼	1.900	3%	¾/16	15¼%	17¼%				12	14	21	41		
2	7½	7	8¾	¾	¼	1.900		¾/16	17¼%	19¼%				16	16	23	45		
3	7½	7¾	8¾	¾	¼	2.875		¾/16	15%	17%				22	21	35	55		
4	7½	7¾	8¾	¾	¼	2.875	5%	¾/16	16%	18%				2	25	24	39		
5	7½	7¾	8¾	¾	¼	2.875		¾/16	18%	20%				2	27	26	41		
6	9	8	10½	¾	¾	3.50		¼	18%	20%				41	40	62	93		
7	9	8	10½	¾	¾	3.50	6%	¼	20%	22%				2	49	48	72		
8	9	8	10½	¾	¾	3.50		¼	21%	23%				2	61	52	75		
9	13¼	10¾/16	16½	¾	½	4.50		½	21¼%	23¼%				97	94	136	207		
10	13¼	10¾/16	16½	¾	½	4.50	8%	½	24%	26%				114	108	150	241		
11	13¼	10¾/16	16½	¾	½	4.50		½	19¼%	21¼%				96	95	134	209		
12	13¼	10¾/16	16½	¾	½	4.50		½	21%	23%				108	104	144	223		
13	13¼	10¾/16	16½	¾	½	4.50	8%	½	26%	28%				144	139	181	305		
14	13¼	10¾/16	16½	¾	½	4.50		½	26%	28%				153	147	188	323		
15	13¼	10¾/16	16½	¾	½	4.50		½	26%	28%				172	163	201	368		
16	13¼	10¾/16	16½	¾	½	2.00	8%	½	31%	33%				218	202	241	462		
17	13¼	10¾/16	16½	¾	½	2.00		½	36	38				273	247	287	572		
18	17¼	15¼	22	¾	¾	2.50	12½	½	35%	37%				512	477	550	1056		
19	17¼	15¼	22	¾	¾	2.50	12½	½	39%	41%				600	548	624	1231		
20	17¼	15¼	22	¾	¾	2.50	12½	½	46%	48%				802	723	807	1633		
21	17¼	15¼	22	¾	¾	3.00	12½	½	51%	53%				940	845	872	1965		
22	17¼	15¼	22	¾	¾	3.00	12½	½	64	66				1240	1140	1184	2566		

## triple spring

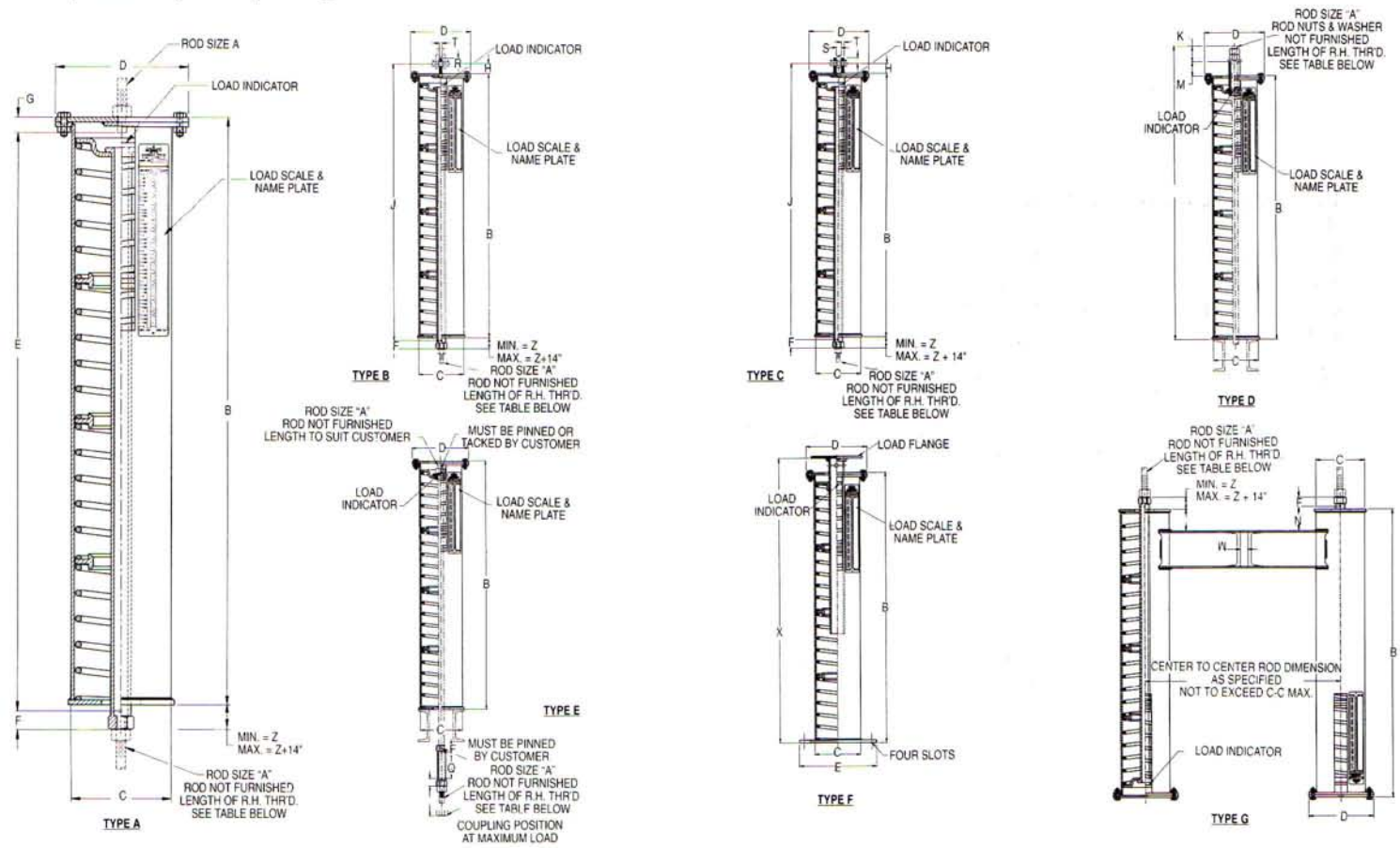


**DIMENSIONS (Inches) See Fig. 268 for dimensions not listed.**

Hanger Size	GENERAL DIMENSIONS						ROD TAKE-OUT FOR TYPES					TYPE A DEPTH THREAD	TYPE D		TYPE F LOADED LENGTH DIM. X		TYPE G
	ROD SIZE A	R.H. Thread Length	CASING Length B	CASING DIA. C	MIN. THREAD F	Z	A	B&C	D	E	G		K	M	MIN.	MAX.	
							E	J	Y	O	N						
0	1/2	12	19 1/8	4	15/16	15/16	19 1/8	20 3/8	28 1/8	11 1/8	1 1/2	7/16	1 1/4	7 3/4	20 15/16	22 15/16	1 1/2
1	1/2	12	21 3/4	4	15/16	15/16	21 3/4	23 1/4	30 3/4	11 1/8	1 1/2	7/16	1 1/4	7 3/4	23 9/16	25 9/16	1 1/2
2	1/2	12	24	4	15/16	15/16	24	25 1/2	33	11 1/8	1 1/2	7/16	1 1/4	7 3/4	25 13/16	27 9/16	1 1/2
3	1/2	12	21 3/16	5 9/16	15/16	15/16	21 3/16	22 11/16	30 9/16	11 1/8	2	7/16	1 1/4	7 3/4	23	25	2
4	1/2	12	23 1/16	5 9/16	15/16	15/16	23 1/16	24 9/16	32 1/16	11 1/8	2	7/16	1 1/4	7 3/4	24 7/8	26 7/8	2
5	1/2	12	25 1/8	5 9/16	15/16	15/16	25 1/8	26 5/8	34 1/8	11 1/8	2	7/16	1 1/4	7 3/4	26 15/16	28 15/16	2
6	5/8	12	25	6 5/8	15/16	15/16	25	26 1/2	34 3/16	11 1/8	2	5/8	1 1/2	7 11/16	26 15/16	28 15/16	2
7	5/8	13	27 15/16	6 5/8	15/16	15/16	27 15/16	29 7/16	37 1/8	11 1/8	2	5/8	1 1/2	7 11/16	29 7/8	31 7/8	2
8	5/8	13	29 9/16	6 5/8	15/16	15/16	29 9/16	30 13/16	38 1/2	11 1/8	2	5/8	1 1/2	7 11/16	31 1/4	33 1/4	2
9	3/4	13	29 9/16	8 5/8	1 1/4	1 1/4	29 9/16	31 1/16	38 7/8	11 1/2	3	1	1 3/4	7 9/16	31 5/8	33 3/8	3
10	3/4	13	33 1/4	8 5/8	1 1/4	1 1/4	33 1/4	34 3/4	42 9/16	11 1/2	3	1	1 3/4	7 9/16	35 5/16	37 9/16	3
11	3/4	13	26 11/16	8 5/8	1 1/4	1 1/4	26 11/16	28 3/16	36	11 1/2	3	1	2	7 9/16	28 3/4	30 3/4	3
12	1	13	28 9/16	8 5/8	1 1/4	1 1/4	28 9/16	30 9/16	38 3/8	11 1/2	3 7/8	1	2 1/4	7 9/16	30 5/8	32 5/8	4
13	1	14	36 1/4	8 5/8	1 1/4	1 1/4	36 1/4	38 1/4	46 1/16	11 1/2	3 7/8	1	2 1/2	7 9/16	38 5/16	40 9/16	4
14	1 1/4	14	36 3/4	8 5/8	1 3/8	1 1/4	36 3/4	39 5/8	47 7/16	11 1/2	4	1	2 1/2	7 9/16	38 13/16	40 13/16	4
15	1 1/4	14	36 5/8	8 5/8	1 3/8	1 1/4	36 5/8	39 1/2	47 3/16	10 9/16	4	1 3/8	3	7 9/16	38 11/16	40 11/16	4
16	1 1/2	15	44 1/16	8 5/8	1 15/16	1 15/16	44 1/16	47 1/16	54 5/8	11 1/16	4	1 3/8	3 1/2	7 1/16	46 1/8	48 1/8	4
17	1 3/4	15	50 1/4	8 5/8	1 15/16	1 15/16	50 1/4	53 1/4	61 1/16	11 9/16	4	1 3/8	4	7 1/16	52 9/16	54 9/16	4
18	2	16	49 1/8	12 3/4	2 3/4	2 3/4	49 1/8	53 1/8	60 11/16	10 7/8	4	2 1/4	4 9/16	7	51 9/16	53 9/16	4
19	2 1/4	16	55 7/8	12 3/4	2 3/4	2 3/4	55 7/8	60 3/8	67 7/8	11 7/16	4	2 1/4	5	7	58 1/16	60 1/16	4
20	2 1/2	17	65 5/8	12 3/4	2 3/4	2 3/4	65 5/8	70 1/8	78 3/16	11 15/16	4	2 1/4	5 9/16	7	67 13/16	69 13/16	4
21	2 3/4	17	73 5/16	12 3/4	3 5/8	3 5/8	73 5/16	76 13/16	87 7/8	11	4	2 3/4	6 1/4	9 9/16	75 5/16	77 5/16	4
22	3	18	91 1/2	12 3/4	3 5/8	3 5/8	91 1/2	95 1/2	106 7/16	11 1/2	4	3	6 5/8	9 9/16	93 3/8	95 3/8	4

THE LOAD TABLE AND INSTRUCTIONS FOR SIZING THIS HANGER MAY BE FOUND ON PAGE PH-104.

## quadruple spring



**DIMENSIONS (Inches) See Fig. 268 for dimensions not listed.**

Hanger Size	GENERAL DIMENSIONS						ROD TAKE-OUT FOR TYPES					TYPE A DEPTH THREAD	TYPE D		TYPE F LOADED LENGTH DIM. X		TYPE G P
	ROD SIZE A	R.H. Thread Length	CASING LENGTH B	CASING DIA. C	MIN. THREAD F	Z	A	B&C	D	E	G		K	M	MIN.	MAX.	
							E	J	Y	Q	N						
0	1/2	16	25 1/8	4	1 5/16	1 5/16	25 1/8	26 5/8	37 1/8	15 1/8	1 1/2	7/16	1 1/4	7 3/4	26 15/16	28 15/16	1 1/2
1	1/2	16	28 5/8	4	1 5/16	1 5/16	28 5/8	30 1/8	40 5/8	15 1/8	1 1/2	7/16	1 1/4	7 3/4	30 7/16	32 7/16	1 1/2
2	1/2	16	31 5/8	4	1 5/16	1 5/16	31 5/8	33 1/8	43 5/8	15 1/8	1 1/2	7/16	1 1/4	7 3/4	33 7/16	35 7/16	1 1/2
3	1/2	16	27 7/8	5 1/16	1 5/16	1 5/16	27 7/8	29 3/8	39 7/8	15 1/8	2	7/16	1 1/4	7 3/4	29 11/16	31 11/16	2
4	1/2	16	30 3/8	5 1/16	1 5/16	1 5/16	30 3/8	31 7/8	42 3/8	15 1/8	2	7/16	1 1/4	7 3/4	32 3/16	34 3/16	2
5	1/2	16	33 1/8	5 1/16	1 5/16	1 5/16	33 1/8	34 5/8	45 1/8	15 1/8	2	7/16	1 1/4	7 3/4	34 15/16	36 15/16	2
6	5/8	16	32 15/16	6 5/8	1 5/16	1 5/16	32 15/16	34 7/16	45 1/8	15 1/8	2	5/8	1 1/2	7 9/16	34 7/8	36 7/8	2
7	5/8	16	36 7/8	6 5/8	1 5/16	1 5/16	36 7/8	38 3/8	49 1/16	15 1/8	2	5/8	1 1/2	7 9/16	38 13/16	40 13/16	2
8	5/8	16	38 11/16	6 5/8	1 5/16	1 5/16	38 11/16	40 3/16	50 7/8	15 1/8	2	5/8	1 1/2	7 9/16	40 5/8	42 5/8	2
9	3/4	16	38 13/16	8 5/8	1 1/4	1 1/4	38 13/16	40 5/16	51 1/8	15 1/2	3	1	1 1/4	7 1/16	40 7/8	42 7/8	3
10	3/4	16	43 3/4	8 5/8	1 1/4	1 1/4	43 3/4	45 1/4	56 1/16	15 1/2	3	1	1 1/4	7 1/16	45 13/16	47 13/16	3
11	3/4	17	35	8 5/8	1 1/4	1 1/4	35	36 1/2	47 5/16	15 1/2	3	1	2	7 1/16	37 1/16	39 1/16	3
12	1	17	37 1/2	8 5/8	1 1/4	1 1/4	37 1/2	39 1/2	50 5/16	15 1/2	3 3/8	1	2 1/4	7 1/16	39 9/16	41 9/16	4
13	1	17	47 3/4	8 5/8	1 1/4	1 1/4	47 3/4	49 3/4	60 9/16	15 1/2	3 3/8	1	2 1/2	7 1/16	49 13/16	51 13/16	4
14	1 1/4	17	48 3/8	8 5/8	1 3/8	1 1/4	48 3/8	51 1/4	61 15/16	15 1/2	4	1	2 1/2	7 1/16	50 7/16	52 7/16	4
15	1 1/4	18	48 1/8	8 5/8	1 3/8	1 1/4	48 1/8	51	61 11/16	14 9/16	4	1 3/8	3	7 1/16	50 3/16	52 3/16	4
16	1 1/2	18	57 7/8	8 5/8	1 15/16	1 15/16	57 7/8	60 7/8	71 7/16	15 1/16	4	1 3/8	3 1/2	7 1/16	59 15/16	61 15/16	4
17	1 3/4	19	66 1/8	8 5/8	1 15/16	1 15/16	66 1/8	69 1/8	80 3/16	15 9/16	4	1 3/8	4	7 1/16	68 3/16	70 3/16	4
18	2	19	64 1/8	12 3/4	2 3/4	2 3/4	64 1/8	68 1/8	78 11/16	14 7/8	4	2 1/4	4 9/16	7	66 5/16	68 5/16	4
19	2 1/4	20	73 1/8	12 3/4	2 3/4	2 3/4	73 1/8	77 5/8	88 1/8	15 1/16	4	2 1/4	5	7	75 5/16	77 5/16	4
20	2 1/2	20	86 1/8	12 3/4	2 3/4	2 3/4	86 1/8	90 5/8	101 11/16	15 15/16	4	2 1/4	5 5/16	7	88 5/16	90 5/16	4
21	2 3/4	21	95 7/8	12 3/4	3 5/8	3 5/8	95 7/8	99 3/8	113 7/16	15	4	2 3/4	6 1/4	9 5/16	98	100	4
22	3	21	120 1/8	12 3/4	3 5/8	3 5/8	120 1/8	124 1/8	138 7/16	15 1/2	4	3	6 5/8	9 5/16	122 1/4	124 1/4	4

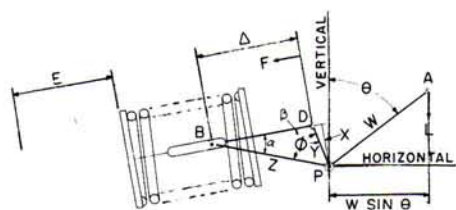
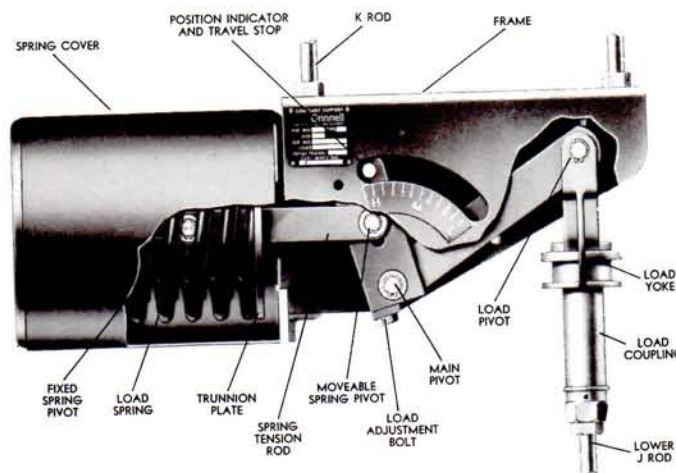
THE LOAD TABLE AND INSTRUCTIONS FOR SIZING THIS HANGER MAY BE FOUND ON PAGE PH-104.

### model R mathematically perfect pipe support

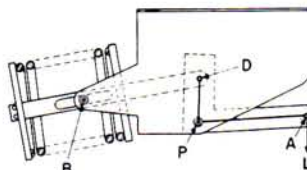
The exclusive geometric design of Grinnell Model R Constant Support hanger assures perfectly constant support through the entire deflection of the pipe load. This counterbalancing of the load and spring moments about the main pivot is obtained by the use of carefully designed compression type load springs, lever, and spring tension rods.

As the lever moves from the high to the low position, the load spring is compressed and the resulting increasing force acting on the decreasing spring moment arm creates a turning moment about the main pivot which is exactly equal and opposite to the turning moment of the load and load moment arm.

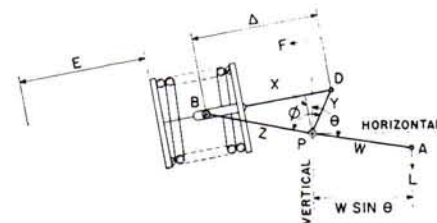
As the lever moves from the low to the high position, the load spring is increasing in length and the resulting decreasing force acting on the increasing spring moment arm creates a turning moment about the main pivot which is exactly equal and opposite to the turning moment of the load and load moment arm.



high position



mid position



low position

$$(1) \frac{\sin \alpha}{Y} = \frac{\sin \phi}{\Delta}$$

$$\frac{\sin \alpha}{Y} = \frac{\sin \beta}{Z}$$

$$\sin \alpha = \frac{Y \sin \beta}{Z}$$

$$\text{and } Y \sin \beta = X$$

$$\sin \alpha = \frac{X}{Z}$$

Substituting in (1):

$$(2) \frac{X}{YZ} = \frac{\sin \phi}{\Delta}$$

$$(3) X = \frac{YZ \sin \phi}{\Delta}$$

The load "L" is suspended from the lever at point "A" and at any point within the load travel range the moment of the load about the main lever-pivot "P" is equal to the load times its moment arm; thus:

(4) Load moment =  $L(W \sin \theta)$ , where  $W \sin \theta$  is the load moment arm.

The spring is attached at one of its ends to the fixed pivot "B". The spring's free end is attached by means of a rod to the lever-pivot "D". This spring arrangement provides a spring moment about the main lever-pivot "P" which opposes the load moment and is equal to the spring force "F" times its moment arm; thus:

(5) Spring moment =  $F \left( \frac{YZ \sin \phi}{\Delta} \right)$ , where  $\frac{YZ \sin \phi}{\Delta}$  is the spring moment arm.

The spring force "F" is equal to the spring constant "K" times the spring deflection "E"; thus:

$$(6) F = KE; \text{ therefore equation \#5 may be written:}$$

$$(7) \text{ Spring moment} = KE \left( \frac{YZ \sin \phi}{\Delta} \right)$$

To obtain perfect constant support the load moment must always equal the spring moment.

$$(8) LW \sin \theta = \frac{KEYZ \sin \phi}{\Delta}$$

By proper design " $\phi$ " and " $\theta$ " are made equal. Therefore, equation #8 may be written.

$$(9) LW = \frac{KEYZ}{\Delta}$$

The spring and the rod are so arranged that the spring deflection "E" always equals the distance "Delta" between pivots "B" and "D". Therefore, equation #9 may be written.

$$(10) LW = KYZ$$

or

$$(11) L = \frac{KYZ}{W}$$

Since equation #11 holds true for all positions of the load within its travel range and "K", "Y", "Z" and "W" remain constant it is therefore true that perfect constant support is obtained.

# Grinnell

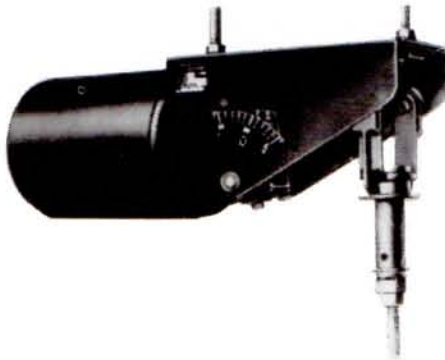
## constant supports

### model R

Vertical: fig. 80-V



Horizontal: fig. 81-H



**FINISH:** Standard finish; painted with semi gloss primer. Corrosion Resistant; galvanized with neoprene coated coil.

**RECOMMENDED SERVICE:** When piping stress is critical and pipe is subject to vertical movement in excess of  $\frac{1}{2}$  inch due to thermal expansion, and also at locations where it is necessary to avoid any transfer of stress from support to support or onto critical terminals or connecting equipment.

**APPROVALS:** Complies with Federal Specification WW-H-171E (Types 52, 58 and 59) and Manufacturers Standardization Society SP-69 (Types 54, 55 and 56).

#### FEATURES:

- Because of exclusive geometric design, mathematically perfect constancy of support is maintained throughout the full range of load adjustment.
- Compactness – design provides smaller and more versatile units.
- Increased load and travel capacity.
- Each hanger is individually calibrated before shipment to support the exact load specified.
- All model R Constant Supports have a wide range of load adjustability. No less than 10% of this adjustability is provided either side of the calibrated load for plus or minus field load adjustment.
- White button marked "C" denotes cold setting of hanger; red button marked "H" denotes hot or operating setting.
- Field load adjustment is made by turning the single load adjustment bolt.
- Covered spring provides protection and good appearance.
- J-rod swings at least  $4^\circ$  from vertical.
- Non-resonant to all vertical vibrations.

**SIZE RANGE:** Grinnell Model R Constant Support Hangers are made in two basic designs – the 80-V (vertical design) and the 81-H (horizontal design). Combined, the 80-V and 81-H Constant Supports are made in nine different frame

sizes and one hundred and ten spring sizes to accommodate travels from  $1\frac{1}{2}$ " to 20" and loads from 27 pounds to 87,500 pounds.

**SINGLE ROD SUSPENSION:** Available in types A, B and C, Fig. 80V (pages ph-125-127) and Fig. 81-H (pages ph-131-133).

**HOW TO SELECT HANGER SIZES:** Determine the total load to be supported by the hanger as well as the actual travel – that is, the actual vertical movement of the pipe at the point of hanger location. Refer to the Load-Travel table for Constant Support hangers (ph-120-123) and select a size hanger which will accommodate the known load and actual travel. It must be noted that the travel shown in the table is a total travel – that is, the maximum vertical movement which the hanger will accommodate. The total travel of the hanger should always be greater than the calculated travel of pipe line to allow for some discrepancy between calculated travel and actual travel. It is suggested that the total travel for Constant Supports should be equal to "actual travel" plus 20%. (1" minimum).

**HOW TO DETERMINE TYPE:** After the size of the Constant Support is determined, consideration of available room for suspending the pipe and hanger will indicate whether a vertical (80-V series, see pages ph-124 through 130) or horizontal (81-H series, see pages ph-131 through 137) hanger is desirable.

**HOW TO DETERMINE DESIGN:** After the hanger size and design are determined, the type of constant support to be used depends upon the physical installation required by the suspension problem, i.e., whether the hanger is to be installed above, between or below steel members (see line cuts referring to Types A, B, C, etc.). It will be noted that the Types F and G are made in the vertical design only. Special Constant Support Hangers can be fabricated for unusual conditions.

**J-ROD AND K-HOLE DIAMETER:** Tapping or drilling for standard rod size will be furnished as shown in the J-rod and K-hole selection charts unless otherwise specified. Upper attachments, turnbuckles and clamps should be tapped to agree with the rod as shown in the selection chart. Standard rod diameters are based on the load to be carried by the upper rod which includes the weight of the hanger assembly as well as the pipe line. Standard diameters conform to the ANSI Code for pressure piping. Other than standard sizes can be furnished when so specified. Tapped connections for hanger rod sizes 3 inch and smaller are National Coarse-Thread Series, Class 2 Fit.  $3\frac{1}{4}$  inch and larger rod tappings are 8UN Series Threads.

**ORDERING:** Specify hanger size number, figure number, type, name of hanger, loads to be supported (pounds), total travel (inches), actual travel (inches); direction of movement "cold to hot", customer's hanger mark. When ordering Type G, specify C-C rod dimension as well as load per spring and total load. For Types A, B, C, Fig. 81-H when required, specify "for single rod suspension." Constant Support Hangers are also available corrosion-resistant as figures C-80-V and C-81-H.

## model R

**INSTALLATION**

- (1) Securely attach the hanger to the building structure at a point where the load coupling is directly over the desired point of attachment to the pipe in the operating position.
- (2) Make certain that the moving parts of the hanger will be unobstructed.
- (3) Attach the lower J-rod between the pipe attachment and the load coupling. Make certain that the lower J-rod has enough thread engagement before taking up the load. A site hole is provided for this.

- (4) Turn the load coupling, as you would a turnbuckle, until the travel indicator rotates to the desired cold setting (white button) marked "C" indicated on the position scale. If the Constant Support incorporates a travel stop see below.
- (5) After the line is in operation, check hanger for indicated hot setting. If necessary, make adjustment by turning the load coupling to bring the indicator to the hot position (red button) marked "H". No other adjustment is normally required since the load as calibrated at the factory is equal to the load specified to be supported.

**ADJUSTMENT:** When the hanger is installed, its supporting force should be in balance with the portion of the piping weight assigned to it. Each hanger is individually calibrated before shipment to support the exact load specified. All model "R" Constant Supports have a wide range of load adjustability. Special instructions for this field recalibration of individual hangers may be obtained from Grinnell representatives. No less than 10% of this adjustability is provided either side of the calibrated load for plus or minus field load adjustment. The percentage increase or decrease from the factory calibrated load should be carefully calculated. The calibrated load setting of each hanger is indicated by an arrow, die-stamped on the load adjustment scale. Load adjustments should be made from this reference point, with each division on the patented scale equal to 2% except sizes 84-110 where each division is valued at 1%. The load adjustment is made by turning the single load adjustment bolt. For example, calibrated load —



Load adjustment scale shown applies to size 1 through 83 only. For information relative to load adjustment scale for sizes 84 through 110, contact a Grinnell representative.

3,000 pounds; revised load — 2,760 pounds. Load is decreased 240 pounds or  $240/3,000$  equals 8%. Turn load adjustment bolt until arrow moves in the "decrease" direction four divisions.

**TRAVEL STOP:** The functional design of the Constant Support Hanger permits the incorporation of a travel stop that will lock the hanger against upward or downward movement for temporary conditions of underload or overload, such as may exist during erection, hydrostatic test or chemical clean-out. Grinnell Constant Supports are designed for hydrostatic test load of up to 2 times the normal operating load for the constant support.

The travel stop consists of two plates, with matched serrations, attached to the hanger frame with two or more cap screws and with a socketed piece which engages the position indicator.

It is installed at the factory to hold the hanger in the "cold" position. A series of serrations can be engaged to lock the hanger at any position along the total travel range.



The travel stop, which is furnished only when specified, is painted red. The stop must be removed before the piping system is put into operation, but not before the hanger is installed and fully loaded. The travel stop is released by removing the cap screws.

A tag marked "Caution" and containing instructions for removal of the travel stop is attached to the hanger.

# Grinnell

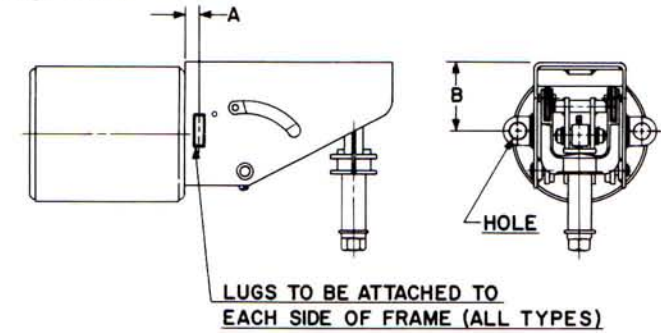
## constant supports

### model R

#### lifting lugs:

To help alleviate the problem of lifting large size Constant Supports into position for installation, this product is available with lifting lugs (if requested) on sizes ten and larger.

fig. 81-H

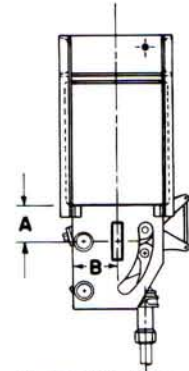
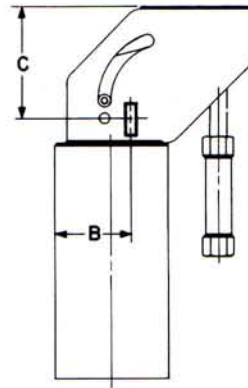
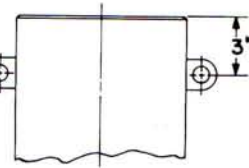


sizes	A	B	hole size
10- 18	1/8"	5"	13/16"
19- 34	1 1/2"	7"	
35- 49	2"	7 1/2"	
50- 63	2"	9 1/2"	
64- 74	2"	14"	
75- 83	3"	17"	1 1/8"
84-110	3"	19"	

fig. 80-V

LUGS TO BE 90° FROM CHANNEL ON TYPE D

Types A, B, C, D, & E  
sizes 10 thru 63



sizes 64 thru 83

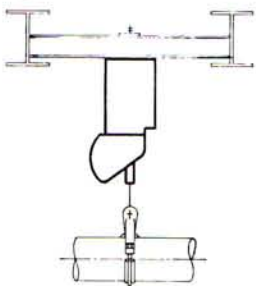
Lugs to be attached to each side of frame and will need stabilizing rigging when being lifted

sizes 84 through 110

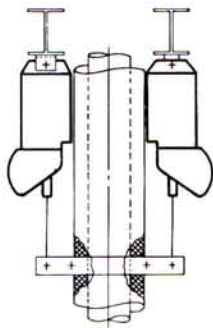
sizes	A	B	C
64-74	8"	10"	
75-83	8"	15"	
84-110		16"	24"

### typical applications

fig. 80-V (vertical)



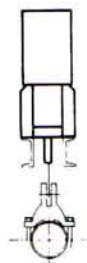
type A



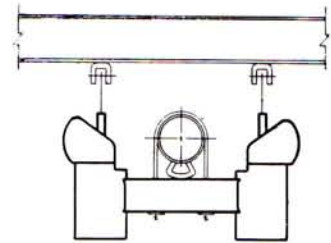
type B and type C



type D

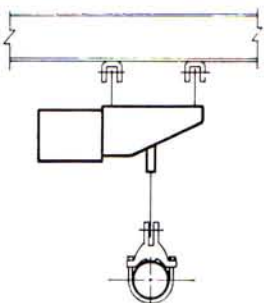


type E

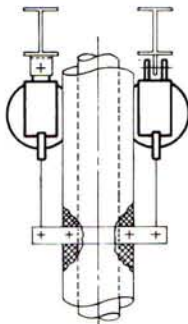


type G

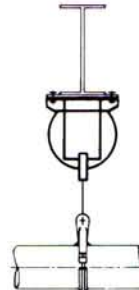
fig. 81-H (horizontal)



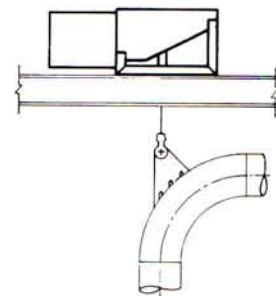
type A



type B and type C



type D



type E





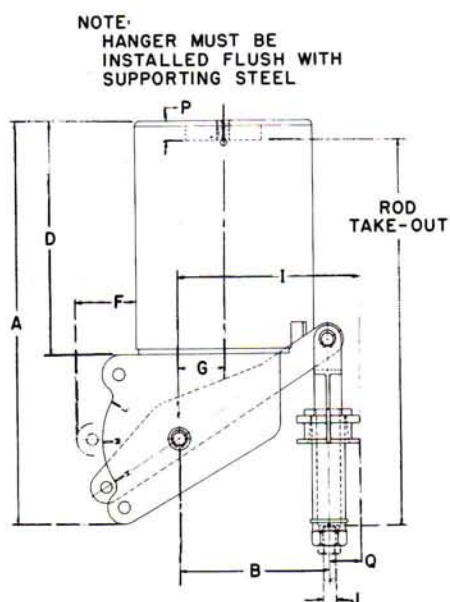




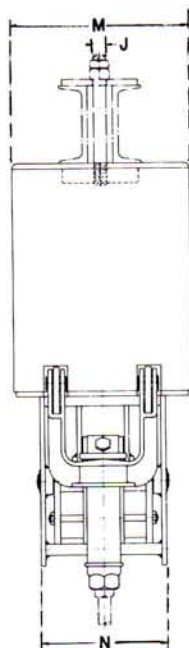


## constant supports

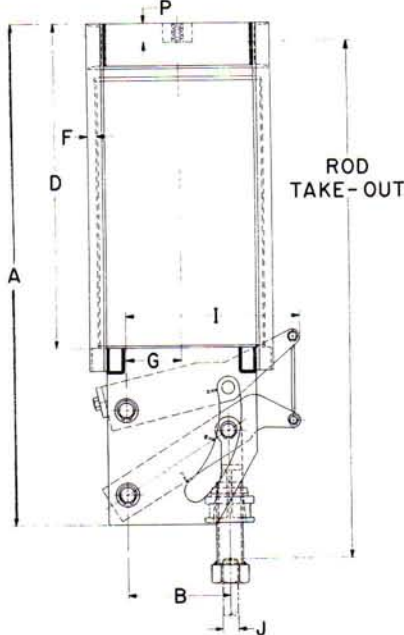
**fig. 80-V type A  
model R**



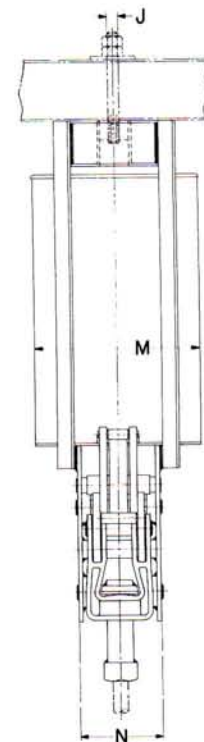
**sizes 10-63**



NOTE:  
HANGER MUST BE  
INSTALLED FLUSH WITH  
SUPPORTING STEEL



**sizes 64-83**



Type A of the Figure 80-V Vertical Design model R Constant Support Hanger is designed for attachment to its supporting member by screwing a rod into a tapped hole in the top cap of hanger a distance equal to the "P" dimension plus 3/8 of an inch. Sight holes are provided near the top of the casing to allow visible

inspection for correct thread engagement of upper hanger rod.

**NOTES:** See load travel tables on pages ph-120-123 for "B" dimension.

For weights see page ph-138.

### dimensions (inches)

hanger sizes	A	D	F	G	I	diam M	N	P	Q	total travel	factor <sup>a</sup>	J-rod		
												min thread length	min rod diam	max rod diam
1-9	available in Fig. 81-H only													
10-18	16 <sup>7/16</sup>	8 <sup>7/8</sup>	2	1 <sup>1/2</sup>	•	8 <sup>5/8</sup>	6 <sup>1/4</sup>	7/8	1 <sup>3/8</sup>	3 <sup>1/2</sup> or less 4 or more	16 <sup>15/16</sup> 19 <sup>1/4</sup>	1 <sup>3/4</sup> + TT	1/2	3/4
19-34	26 <sup>1/4</sup>	16	2 <sup>1/8</sup>	2 <sup>5/8</sup>	•	12 <sup>3/4</sup>	8 <sup>3/8</sup>	1 <sup>1/8</sup>	1 <sup>5/8</sup>	5 or less 5 <sup>1/2</sup> or more	27 <sup>15/16</sup> 30 <sup>1/16</sup>	2 <sup>3/8</sup> + TT	1/2	1 <sup>1/4</sup>
35-49	31 <sup>5/16</sup>	18 <sup>1/4</sup>	4 <sup>3/4</sup>	3 <sup>3/4</sup>	•	14	9 <sup>15/16</sup>	1 <sup>1/2</sup>	2 <sup>1/2</sup>	6 or less 6 <sup>1/2</sup> or more	32 <sup>3/8</sup> 37	3 <sup>1/4</sup> + TT	1/2	1 <sup>3/4</sup>
50-63	46 <sup>7/8</sup>	28 <sup>7/8</sup>	8 <sup>5/16</sup>	5 <sup>7/8</sup>	•	18	11 <sup>1/4</sup>	2	3	11 or less 11 <sup>1/2</sup> or more	46 <sup>1/2</sup> 51 <sup>3/4</sup>	4 <sup>1/4</sup> + TT	3/4	2 <sup>1/4</sup>
64-74	67 <sup>1/2</sup>	44 <sup>1/4</sup>	1 <sup>3/16</sup>	7 <sup>1/2</sup>	25 <sup>3/8</sup>	22 <sup>3/16</sup>	11	2 <sup>1/2</sup>	...	10 <sup>1/2</sup> or less 11 or more	77 <sup>5/8</sup> 77 <sup>3/4</sup>	5 <sup>3/4</sup> + TT	1 <sup>1/4</sup>	2 <sup>3/4</sup>
75-83	69 <sup>1/2</sup>	46 <sup>1/4</sup>	1 <sup>1/2</sup>	7 <sup>1/2</sup>	25 <sup>3/8</sup>	27 <sup>3/16</sup>	11	3	...	10 <sup>1/2</sup> or less 11 or more	78 <sup>3/16</sup> 78 <sup>5/16</sup>	5 <sup>3/4</sup> + TT	1 <sup>1/2</sup>	3 <sup>1/4</sup> •
84-110	see page ph-130													

• Rod take-out = (factor) minus  $\left(\frac{\text{total travel}}{2}\right)$

• "I" dimension for sizes 10 through 63 equals "B" plus "Q".

### J-rod selection chart

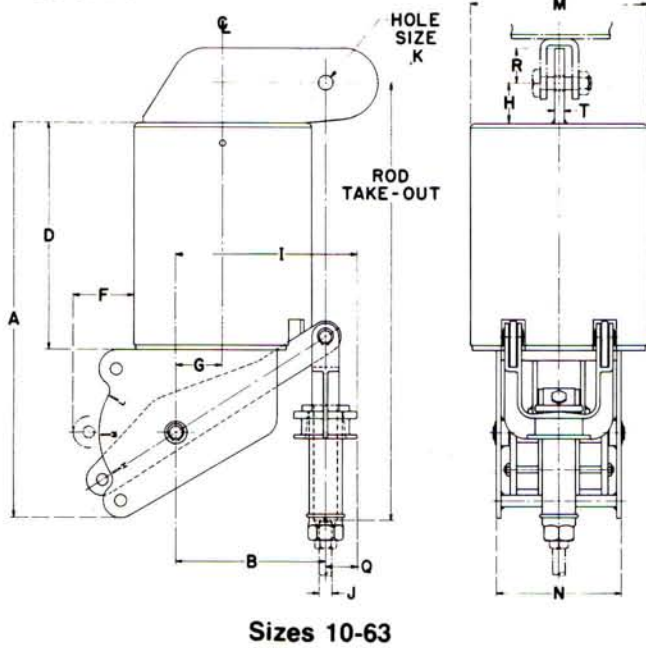
load lb	0	801	1501	2541	4001	6101	9401	13401	18301	24701	31001	39001	48001
rod diam	1/2	5/8	3/4	1	1 <sup>1/4</sup>	1 <sup>1/2</sup>	1 <sup>3/4</sup>	2	2 <sup>1/4</sup>	2 <sup>1/2</sup>	2 <sup>3/4</sup>	3	3 <sup>1/4</sup> •

• 3<sup>1/4</sup> inch is furnished with 8 UN series threads.

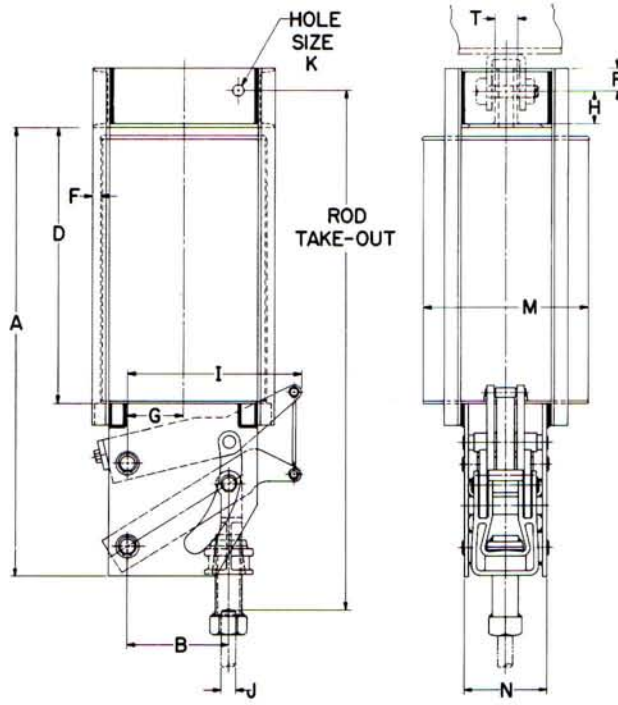
# Grinnell

## constant supports

fig. 80-V type B  
model R



Sizes 10-63



Sizes 64-83

Type B is furnished with a single lug for attachment to the building structure. The lug permits use of a Figure 66\* welded beam attachment, a Figure 299 clevis or a pair of angles for attachment where headroom is limited.

**NOTES:** See load travel tables on pages ph-120-123 for "B" dimension.

For weights see page ph-139.

### dimensions (inches)

hanger sizes	A	D	F	G	H	I	diam M	N	Q	R	T	total travel	factor	J-rod		
														min thread length	min rod diam	max rod diam
1-9	available in fig. 81-H only															
10-18	16 <sup>7/16</sup>	8 <sup>3/8</sup>	2	1 <sup>1/2</sup>	1 <sup>1/2</sup>	•	8 <sup>3/8</sup>	6 <sup>1/4</sup>	1 <sup>3/8</sup>	1 <sup>1/2</sup>	3/8	3 <sup>1/2</sup> or less 4 or more	19 <sup>5/16</sup> 21 <sup>3/8</sup>	1 <sup>3/4</sup> + TT	1/2	3/4
19-34	26 <sup>1/4</sup>	16	2 <sup>1/8</sup>	2 <sup>5/8</sup>	2	•	12 <sup>3/4</sup>	8 <sup>3/8</sup>	1 <sup>5/8</sup>	1 <sup>1/2</sup>	3/8	5 or less 5 <sup>1/2</sup> or more	31 <sup>1/16</sup> 33 <sup>3/16</sup>	2 <sup>3/4</sup> + TT	1/2	1 <sup>1/4</sup>
35-49	31 <sup>5/16</sup>	18 <sup>1/4</sup>	4 <sup>3/4</sup>	3 <sup>3/4</sup>	3	•	14	9 <sup>15/16</sup>	2 <sup>1/2</sup>	1 <sup>1/4</sup> K-hole and smaller, 1 <sup>1/2</sup> 1 <sup>3/8</sup> K-hole and larger, 2	3/4	6 or less 6 <sup>1/2</sup> or more	36 <sup>7/8</sup> 41 <sup>1/2</sup>	3 <sup>3/4</sup> + TT	1/2	1 <sup>3/4</sup>
50-63	46 <sup>7/8</sup>	28 <sup>3/8</sup>	8 <sup>5/16</sup>	5 <sup>7/8</sup>	4	•	18	11 <sup>1/4</sup>	3	1 <sup>5/16</sup> K-hole, 1 <sup>1/2</sup> 1 <sup>1/8</sup> thru 1 <sup>3/8</sup> K-hole, 2 1 <sup>1/2</sup> K-hole and larger, 3	1	11 or less 11 <sup>1/2</sup> or more	52 <sup>1/2</sup> 57 <sup>3/4</sup>	4 <sup>1/4</sup> + TT	3/4	2 <sup>1/4</sup>
64-74	60 <sup>1/2</sup>	37 <sup>1/4</sup>	1 <sup>3/16</sup>	7 <sup>1/2</sup>	4 <sup>1/2</sup>	25 <sup>3/8</sup>	22 <sup>3/16</sup>	11	...	3	2	10 <sup>1/2</sup> or less 11 or more	77 <sup>1/4</sup> 77 <sup>3/8</sup>	5 <sup>3/4</sup> + TT	1 <sup>1/4</sup>	2 <sup>3/4</sup>
75-83	61 <sup>1/4</sup>	38	1 <sup>1/2</sup>	7 <sup>1/2</sup>	3 <sup>3/8</sup>	25 <sup>3/8</sup>	27 <sup>3/16</sup>	11	...	3 <sup>3/4</sup>	2 <sup>1/2</sup>	10 <sup>1/2</sup> or less 11 or more	77 <sup>15/16</sup> 78 <sup>1/16</sup>	5 <sup>3/4</sup> + TT	1 <sup>1/2</sup>	3 <sup>1/4</sup> *
84-110	see page ph-130															

• Rod take-out = (factor) minus  $\left(\frac{\text{total travel}}{2}\right)$

• "I" dimension for sizes 10 through 63 equals "B" plus "Q".

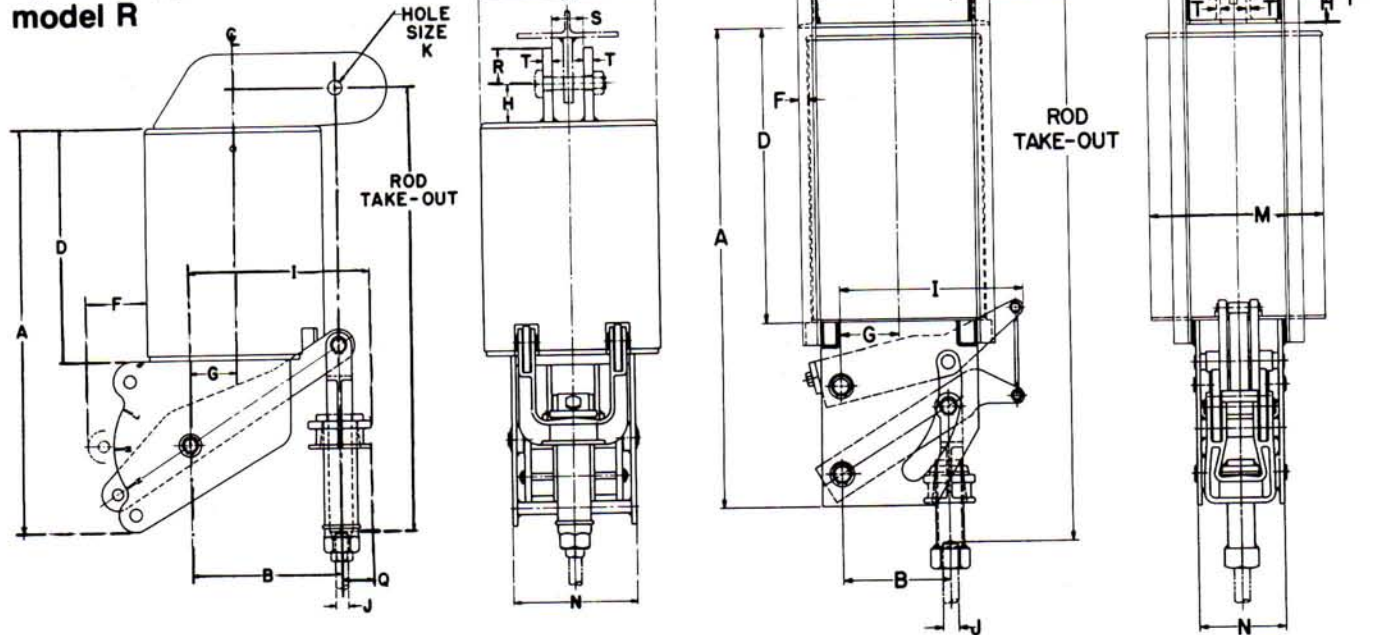
### J-rod — K-hole selection chart

load lb	0	801	1501	2541	4001	6101	9401	13401	18301	24701	31001	39001	48001
	800	1500	2540	4000	6100	9400	13400	18300	24700	31000	39000	48000	58000
J-rod size	1/2	3/8	3/4	1	1 <sup>1/4</sup>	1 <sup>1/2</sup>	1 <sup>3/4</sup>	2	2 <sup>1/4</sup>	2 <sup>1/2</sup>	2 <sup>3/4</sup>	3	3 <sup>1/4</sup> *
K-hole size	1 <sup>1/16</sup>	1 <sup>3/16</sup>	1 <sup>5/16</sup>	1 <sup>1/4</sup>	1 <sup>1/2</sup>	1 <sup>3/4</sup>	2	2 <sup>3/8</sup>	2 <sup>1/2</sup>	2 <sup>7/8</sup>	3 <sup>1/8</sup>	3 <sup>1/4</sup>	3 <sup>3/8</sup>

• 3<sup>1/4</sup> inch is furnished with 8 UN series threads.

\*For constant support sizes 50-63 and 64-74 where 1<sup>1/4</sup> inch rod is required, check the "R" dimensions versus the Fig. 66 welded beam attachment dimensions for compatibility.

fig. 80-V type C model R



Sizes 64-83

Type C is furnished with a pair of lugs for attachment to the building structure. These lugs permit the use of an eye rod or a single plate for attachment where head-room is limited.

**NOTES:** See load travel tables on pages ph-120-123 for "B" dimension.

For weights see page ph-139.

**dimensions (inches)**

hanger sizes	A	D	F	G	H	I	diam M	N	Q	R	T	total travel	factor	J-rod		
														min thread length	min rod diam	max rod diam
1-9	available in fig. 81-H only															
10-18	16 <sup>7</sup> / <sub>16</sub>	8 <sup>3</sup> / <sub>8</sub>	2	1 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>2</sub>	•	8 <sup>3</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>2</sub>	3/8	3 <sup>1</sup> / <sub>2</sub> or less 4 or more	19 <sup>5</sup> / <sub>16</sub> 21 <sup>1</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>4</sub> + TT	1/2	3/4
19-34	26 <sup>1</sup> / <sub>4</sub>	16	2 <sup>1</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>8</sub>	2	•	12 <sup>3</sup> / <sub>4</sub>	8 <sup>3</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>2</sub>	3/8	5 or less 5 <sup>1</sup> / <sub>2</sub> or more	31 <sup>1</sup> / <sub>16</sub> 33 <sup>3</sup> / <sub>16</sub>	2 <sup>3</sup> / <sub>8</sub> + TT	1/2	1 <sup>1</sup> / <sub>4</sub>
35-49	31 <sup>5</sup> / <sub>16</sub>	18 <sup>1</sup> / <sub>4</sub>	4 <sup>3</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>4</sub>	3	•	14	9 <sup>15</sup> / <sub>16</sub>	2 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>4</sub> K-hole and smaller, 1 <sup>1</sup> / <sub>2</sub> 1 <sup>3</sup> / <sub>8</sub> K-hole and larger, 2	3/4	6 or less 6 <sup>1</sup> / <sub>2</sub> or more	36 <sup>7</sup> / <sub>8</sub> 41 <sup>1</sup> / <sub>2</sub>	3 <sup>3</sup> / <sub>4</sub> + TT	1/2	1 <sup>3</sup> / <sub>4</sub>
50-63	46 <sup>7</sup> / <sub>8</sub>	28 <sup>3</sup> / <sub>8</sub>	8 <sup>5</sup> / <sub>16</sub>	5 <sup>7</sup> / <sub>8</sub>	4	•	18	11 <sup>1</sup> / <sub>4</sub>	3	1 <sup>5</sup> / <sub>16</sub> K-hole, 1 <sup>1</sup> / <sub>2</sub> 1 <sup>1</sup> / <sub>8</sub> thru 1 <sup>3</sup> / <sub>8</sub> K-hole, 2 1 <sup>1</sup> / <sub>2</sub> K-hole and larger, 3	1	11 or less 11 <sup>1</sup> / <sub>2</sub> or more	52 <sup>1</sup> / <sub>2</sub> 57 <sup>3</sup> / <sub>4</sub>	4 <sup>1</sup> / <sub>4</sub> + TT	3/4	2 <sup>1</sup> / <sub>4</sub>
64-74	60	36 <sup>3</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>16</sub>	7 <sup>1</sup> / <sub>2</sub>	5	25 <sup>3</sup> / <sub>8</sub>	22 <sup>3</sup> / <sub>16</sub>	11	...	3	1/2	10 <sup>1</sup> / <sub>2</sub> or less 11 or more	77 <sup>1</sup> / <sub>4</sub> 77 <sup>3</sup> / <sub>4</sub>	5 <sup>3</sup> / <sub>4</sub> + TT	1 <sup>1</sup> / <sub>4</sub>	2 <sup>3</sup> / <sub>4</sub>
75-83	60 <sup>1</sup> / <sub>2</sub>	37 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>2</sub>	4 <sup>1</sup> / <sub>4</sub>	25 <sup>3</sup> / <sub>8</sub>	27 <sup>1</sup> / <sub>16</sub>	11	...	3 <sup>3</sup> / <sub>4</sub>	1	10 <sup>1</sup> / <sub>2</sub> or less 11 or more	77 <sup>15</sup> / <sub>16</sub> 78 <sup>1</sup> / <sub>16</sub>	5 <sup>3</sup> / <sub>4</sub> + TT	1 <sup>1</sup> / <sub>2</sub>	3 <sup>1</sup> / <sub>4</sub> *

84-110 | see page ph-130

- Rod take-out = (factor) minus  $\left(\frac{\text{total travel}}{2}\right)$
- "I" dimension for sizes 10 through 63 equals "B" plus "Q".

**J-rod — K-hole selection chart**

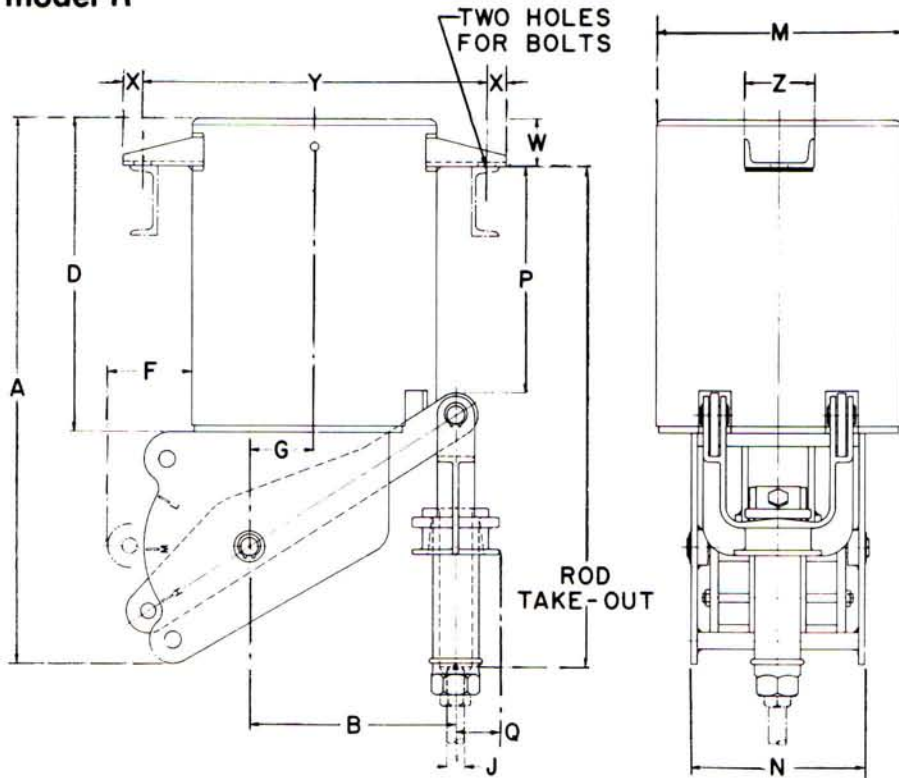
load lb	0	801	1501	2541	4001	6101	9401	13401	18301	24701	31001	39001	48001
	800	1500	2540	4000	6100	9400	13400	18300	24700	31000	39000	48000	58000
J-rod size	1/2	3/8	3/4	1	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2	2 3/4	3	3 1/4*
K-hole size	1 1/16	1 3/16	1 5/16	1 1/4	1 1/2	1 3/4	2	2 1/8	2 1/4	2 1/2	2 3/4	3	3 1/8
S	3/8	1 1/16	1 1/4	1 1/8	2	2 1/8	2 1/4	2 1/2	3	3 1/8	3 1/4	3 1/2	4 1/8

\* 3/4 inch is furnished with 8 UN series threads.

# Grinnell

## constant supports

fig. 80-V type D  
model R



Type D rests on top of structural steel while most of the constant support itself hangs between or below the supporting beams. The depth of the beam is limited by the "P" dimension. Dimension "P" can be varied on special order, however, "P" dimension shown is maximum for the hanger.

**NOTES:** See load travel tables on pages ph-120-123 for "B" dimension.

For weights see page ph-138.

### dimensions (inches)

hanger sizes	A	D	F	G	diam M	N	Q	P	W	X	Y	Z	bracket hole diam	total travel	factor	J-rod		
																min thread length	min rod diam	max rod diam
1-9	available in fig. 81-H only																	
10-18	16 <sup>7</sup> / <sub>16</sub>	8 <sup>7</sup> / <sub>8</sub>	2	1 <sup>1</sup> / <sub>2</sub>	8 <sup>5</sup> / <sub>8</sub>	6 <sup>1</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>8</sub>	4 <sup>15</sup> / <sub>16</sub>	2 <sup>3</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>2</sub>	10 <sup>3</sup> / <sub>4</sub>	3	<sup>3</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>2</sub> or less 4 or more	15 <sup>1</sup> / <sub>2</sub> 17 <sup>13</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>4</sub> + TT	<sup>1</sup> / <sub>2</sub>	<sup>3</sup> / <sub>4</sub>
19-34	26 <sup>1</sup> / <sub>4</sub>	16	2 <sup>1</sup> / <sub>8</sub>	2 <sup>1</sup> / <sub>8</sub>	12 <sup>3</sup> / <sub>4</sub>	8 <sup>3</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>8</sub>	12 <sup>1</sup> / <sub>2</sub>	2 <sup>3</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>2</sub>	14 <sup>3</sup> / <sub>8</sub>	3	<sup>7</sup> / <sub>8</sub>	5 or less 5 <sup>1</sup> / <sub>2</sub> or more	26 <sup>11</sup> / <sub>16</sub> 28 <sup>13</sup> / <sub>16</sub>	2 <sup>3</sup> / <sub>8</sub> + TT	<sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>4</sub>
35-49	31 <sup>5</sup> / <sub>16</sub>	18 <sup>1</sup> / <sub>4</sub>	4 <sup>1</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>4</sub>	14	9 <sup>15</sup> / <sub>16</sub>	2 <sup>1</sup> / <sub>2</sub>	13 <sup>1</sup> / <sub>4</sub>	2 <sup>5</sup> / <sub>8</sub>	2	16 <sup>3</sup> / <sub>4</sub>	4	1 <sup>1</sup> / <sub>8</sub>	6 or less 6 <sup>1</sup> / <sub>2</sub> or more	31 <sup>1</sup> / <sub>4</sub> 35 <sup>7</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>4</sub> + TT	<sup>1</sup> / <sub>2</sub>	1 <sup>3</sup> / <sub>4</sub>
50-63	46 <sup>7</sup> / <sub>8</sub>	28 <sup>1</sup> / <sub>8</sub>	8 <sup>5</sup> / <sub>16</sub>	5 <sup>7</sup> / <sub>8</sub>	18	11 <sup>1</sup> / <sub>4</sub>	3	24 <sup>1</sup> / <sub>2</sub>	2 <sup>7</sup> / <sub>8</sub>	3	21	6	1 <sup>3</sup> / <sub>8</sub>	11 or less 11 <sup>1</sup> / <sub>2</sub> or more	45 <sup>9</sup> / <sub>16</sub> 50 <sup>7</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>4</sub> + TT	<sup>3</sup> / <sub>4</sub>	2 <sup>1</sup> / <sub>4</sub>
64-83	available in fig 81-H only																	
84-110	not available																	

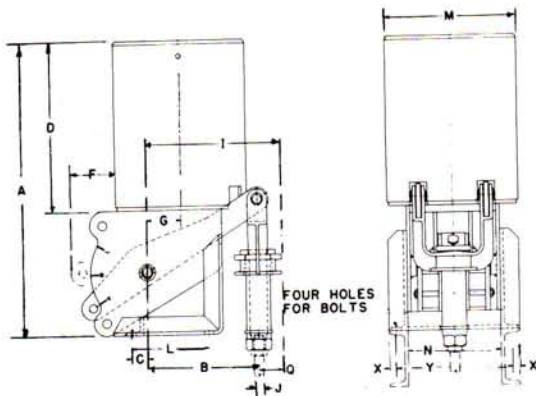
• Rod take-out = (factor) minus  $\left(\frac{\text{total travel}}{2}\right)$

### J-rod selection chart

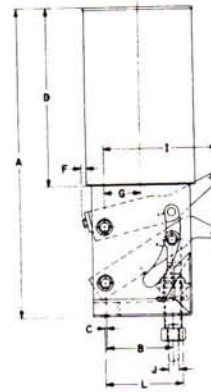
load lb	0 800	801 1500	1501 2540	2541 4000	4001 6100	6101 9400	9401 13400	13401 18300	18301 24700
rod diam	<sup>1</sup> / <sub>2</sub>	<sup>5</sup> / <sub>8</sub>	<sup>3</sup> / <sub>4</sub>	1	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>2</sub>	1 <sup>3</sup> / <sub>4</sub>	2	2 <sup>1</sup> / <sub>4</sub>



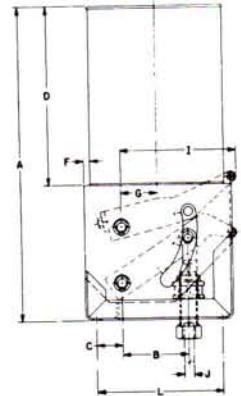
fig. 80-V type E  
model R



Sizes 10-63



Sizes 64-74



Sizes 75-83

Type E rests on the top flange of structural steel and the constant support is entirely above the supporting beams.

If rod take-out does not exceed the depth of the supporting steel and the rod coupling is required to extend

below the steel, specify the depth of the supporting steel. Increase rod take-out by depth of the steel.

**NOTES:** See load travel tables on pages ph-120-123 for "B" dimension.

For weights see page ph-138.

### dimensions (inches)

hanger sizes	A	C	D	F	G	I	L	diam M	N	Q	X	Y	angle size	bracket hole diam	total travel	factor	J-rod		
																	min thread length	min rod diam	max rod diam
1-9	available in fig 81-H only																		
10-18	16 <sup>7</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>2</sub>	8 <sup>7</sup> / <sub>8</sub>	2	1 <sup>1</sup> / <sub>2</sub>	•	4 <sup>5</sup> / <sub>16</sub>	8 <sup>5</sup> / <sub>16</sub>	6 <sup>1</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>8</sub>	8 <sup>1</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>2</sub> x1 <sup>1</sup> / <sub>2</sub> x <sup>1</sup> / <sub>4</sub>	3 <sup>4</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>2</sub> or less 4 or more	1 <sup>7</sup> / <sub>16</sub> 3 <sup>3</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>4</sub> + TT	1/2	3/4
19-34	26 <sup>1</sup> / <sub>4</sub>	1 <sup>13</sup> / <sub>16</sub>	16	2 <sup>1</sup> / <sub>8</sub>	2 <sup>5</sup> / <sub>8</sub>	•	6 <sup>11</sup> / <sub>16</sub>	12 <sup>3</sup> / <sub>4</sub>	8 <sup>3</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>8</sub>	5 <sup>1</sup> / <sub>8</sub>	10 <sup>3</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>2</sub> x1 <sup>1</sup> / <sub>2</sub> x <sup>1</sup> / <sub>4</sub>	3 <sup>4</sup> / <sub>8</sub>	5 or less 5 <sup>1</sup> / <sub>2</sub> or more	2 <sup>13</sup> / <sub>16</sub> 4 <sup>15</sup> / <sub>16</sub>	2 <sup>3</sup> / <sub>8</sub> + TT	1/2	1 <sup>1</sup> / <sub>4</sub>
35-49	31 <sup>5</sup> / <sub>16</sub>	1 <sup>7</sup> / <sub>8</sub>	18 <sup>1</sup> / <sub>4</sub>	4 <sup>3</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>4</sub>	•	8 <sup>5</sup> / <sub>16</sub>	14	9 <sup>15</sup> / <sub>16</sub>	2 <sup>1</sup> / <sub>2</sub>	1 <sup>3</sup> / <sub>16</sub>	12 <sup>3</sup> / <sub>8</sub>	2 x2 x <sup>3</sup> / <sub>8</sub>	7 <sup>8</sup> / <sub>16</sub>	6 or less 6 <sup>1</sup> / <sub>2</sub> or more	2 <sup>1</sup> / <sub>2</sub> 7 <sup>7</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>4</sub> + TT	1/2	1 <sup>3</sup> / <sub>4</sub>
50-63	46 <sup>7</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>4</sub>	28 <sup>1</sup> / <sub>8</sub>	8 <sup>5</sup> / <sub>16</sub>	5 <sup>7</sup> / <sub>8</sub>	•	12 <sup>13</sup> / <sub>16</sub>	18	11 <sup>1</sup> / <sub>4</sub>	3	1 <sup>5</sup> / <sub>16</sub>	14 <sup>11</sup> / <sub>16</sub>	3 x3 x <sup>3</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>8</sub>	11 or less 11 <sup>1</sup> / <sub>2</sub> or more	1 <sup>5</sup> / <sub>8</sub> 7	4 <sup>1</sup> / <sub>4</sub> + TT	3/4	2 <sup>1</sup> / <sub>4</sub>
64-74	62	3 <sup>8</sup> / <sub>16</sub>	35 <sup>3</sup> / <sub>4</sub>	3 <sup>8</sup> / <sub>16</sub>	7 <sup>1</sup> / <sub>2</sub>	25 <sup>3</sup> / <sub>8</sub>	15 <sup>3</sup> / <sub>4</sub>	22 <sup>3</sup> / <sub>16</sub>	11	...	1 <sup>9</sup> / <sub>16</sub>	14 <sup>15</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>2</sub> x3 <sup>1</sup> / <sub>2</sub> x <sup>1</sup> / <sub>2</sub>	1 <sup>5</sup> / <sub>8</sub>	10 <sup>1</sup> / <sub>2</sub> or less 11 or more	9 <sup>1</sup> / <sub>8</sub> 9 <sup>1</sup> / <sub>4</sub>	5 <sup>3</sup> / <sub>4</sub> + TT	1 <sup>1</sup> / <sub>4</sub>	2 <sup>3</sup> / <sub>4</sub>
75-83	62 <sup>1</sup> / <sub>2</sub>	5 <sup>1</sup> / <sub>4</sub>	35 <sup>3</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>2</sub>	25 <sup>3</sup> / <sub>8</sub>	25 <sup>3</sup> / <sub>8</sub>	27 <sup>3</sup> / <sub>16</sub>	11	...	1 <sup>3</sup> / <sub>4</sub>	15 <sup>1</sup> / <sub>2</sub>	4 x4 x <sup>3</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>8</sub>	10 <sup>1</sup> / <sub>2</sub> or less 11 or more	8 <sup>3</sup> / <sub>8</sub> 8 <sup>7</sup> / <sub>8</sub>	5 <sup>3</sup> / <sub>4</sub> + TT	1 <sup>1</sup> / <sub>2</sub>	3 <sup>3</sup> / <sub>4</sub> •
84-110	not available																		

• Rod take-out = (factor) minus  $\left( \frac{\text{total travel}}{2} \right)$

• "I" dimension for sizes 10 through 63 equals "B" plus "Q".

• Note - Rod take out is measured from the bottom of the supporting angles to the center of the load coupling site hole.

### J-rod selection chart

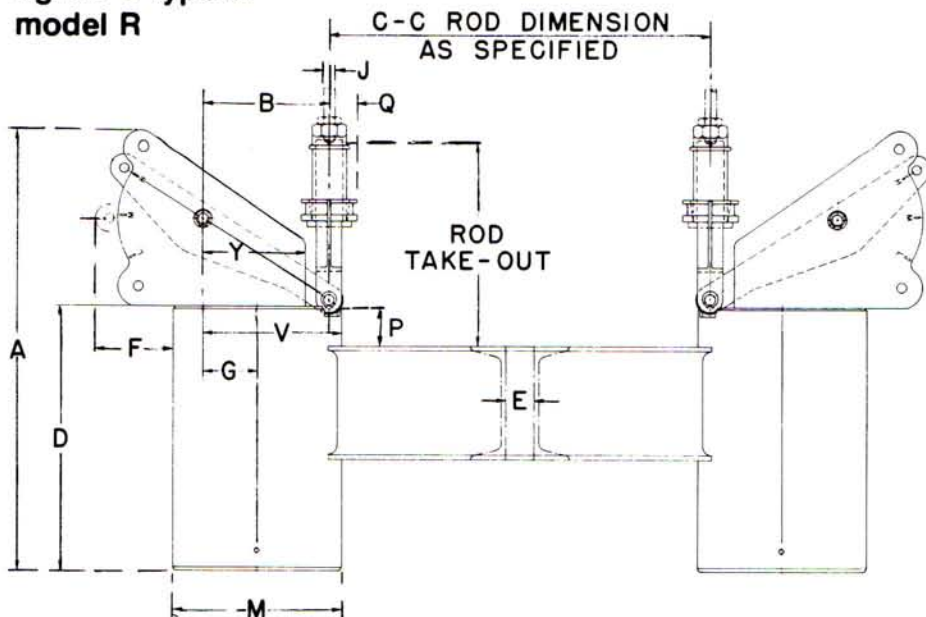
load lb	0	801	1501	2541	4001	6101	9401	13401	18301	24701	31001	39001	48001
	800	1500	2540	4000	6100	9400	13400	18300	24700	31000	39000	48000	58000
rod diam	1/2	3/8	3/4	1	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>2</sub>	1 <sup>3</sup> / <sub>4</sub>	2	2 <sup>1</sup> / <sub>4</sub>	2 <sup>1</sup> / <sub>2</sub>	2 <sup>3</sup> / <sub>4</sub>	3	3 <sup>1</sup> / <sub>4</sub> •

• 3/4 inch is furnished with 8 UN series threads.

# Grinnell

## constant supports

fig. 80-V type G  
model R



**NOTES:** See load travel tables on pages ph-120-123 for "B" dimension.

For weights see page ph-138.

Type G is a complete trapeze assembly. The hanger consists of two vertical type constant support units plus a pair of channels, back-to-back, welded at each end to the hanger casing.

In sizing a Type G hanger, it must be remembered that each standard spring unit carries one-half of the total pipe load. Furthermore, the weight of the hanger itself must be considered as part of the overall load. Therefore, using one-half the total pipe load, select the required hanger size from the Load-Travel table and add one-half the weight of the size hanger selected to one-half the total pipe load. If the load now exceeds the maximum load at the required total travel for the hanger size selected, it is necessary to go to the next

larger hanger. If the pipe line is designed so as not to be centered on the channel, one spring of the trapeze will carry a heavier load than the other and care must be taken in sizing the individual hanger units. The center-to-center rod dimension must be specified when ordering. The minimum C-C dimension can be determined as follows:

B plus Q greater than Y: O.D. of pipe covering plus 2Q.

B plus Q less than Y: O.D. of pipe covering plus 2 (Y minus B).

**NOTE:** If U-bolt is used to fasten pipe to channels, C-C of U-bolt tangents plus one washer plate width cannot be greater than C-C of the hanger rods minus 2 (V minus B).

### dimensions (inches)

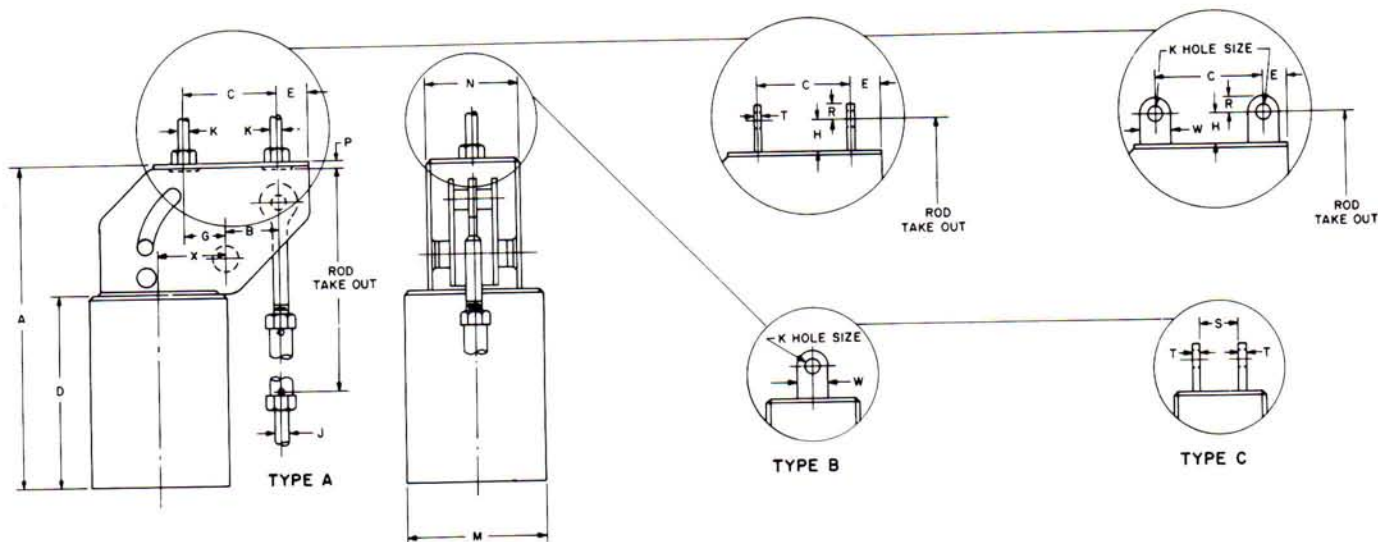
hanger size	A	D	E	F	G	diam M	N	P	Q	V	Y	channel size	total travel	factor	J-rod		
															min thread length	min rod diam	max rod diam
1-9	not available																
10-18	16 <sup>7</sup> / <sub>16</sub>	8 <sup>7</sup> / <sub>8</sub>	1	2	1 <sup>1</sup> / <sub>2</sub>	8 <sup>7</sup> / <sub>8</sub>	See Type A	2 <sup>9</sup> / <sub>16</sub>	3 <sup>1</sup> / <sub>2</sub>	5 <sup>13</sup> / <sub>16</sub>	3 <sup>15</sup> / <sub>16</sub>	4 @ 5.4 lb/ft	3 <sup>1</sup> / <sub>2</sub> or less 4 or more	11 <sup>11</sup> / <sub>16</sub> 14	1 <sup>3</sup> / <sub>4</sub> + TT	1/2	3/4
19-34	26 <sup>1</sup> / <sub>4</sub>	16	1 <sup>1</sup> / <sub>4</sub>	2 <sup>1</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>8</sub>	12 <sup>3</sup> / <sub>4</sub>		3 <sup>9</sup> / <sub>16</sub>	4	9	6 <sup>3</sup> / <sub>8</sub>	6 @ 10.5 lb/ft	5 or less 5 <sup>1</sup> / <sub>2</sub> or more	16 <sup>13</sup> / <sub>16</sub> 18 <sup>3</sup> / <sub>4</sub>	2 <sup>3</sup> / <sub>8</sub> + TT	1/2	1 <sup>1</sup> / <sub>4</sub>
35-49	31 <sup>5</sup> / <sub>16</sub>	18 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>2</sub>	4 <sup>3</sup> / <sub>4</sub>	3 <sup>3</sup> / <sub>4</sub>	14		3 <sup>7</sup> / <sub>16</sub>	5 <sup>1</sup> / <sub>2</sub>	10 <sup>3</sup> / <sub>4</sub>	8	10 @ 15.3 lb/ft	6 or less 6 <sup>1</sup> / <sub>2</sub> or more	19 <sup>1</sup> / <sub>4</sub> 23 <sup>3</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>4</sub> + TT	1/2	1 <sup>3</sup> / <sub>4</sub>
50-63	46 <sup>7</sup> / <sub>8</sub>	28 <sup>1</sup> / <sub>8</sub>	2 <sup>1</sup> / <sub>8</sub>	8 <sup>5</sup> / <sub>16</sub>	5 <sup>7</sup> / <sub>8</sub>	18		4	6 <sup>1</sup> / <sub>2</sub>	14 <sup>3</sup> / <sub>4</sub>	10 <sup>15</sup> / <sub>16</sub>	12 @ 20.7 lb/ft	11 or less 11 <sup>1</sup> / <sub>2</sub> or more	24 <sup>3</sup> / <sub>8</sub> 30	4 <sup>1</sup> / <sub>4</sub> + TT	3/4	2 <sup>1</sup> / <sub>4</sub>
64-110	not available																

■ Rod take-out = (factor) minus  $\left(\frac{\text{total travel}}{2}\right)$

### J-rod selection chart

load lb per spring	0	801	1501	2540	4001	6101	9401	13401	18301
	800	1500	2540	4000	6100	9400	13400	18300	24700
rod diam	1/2	3/8	3/4	1	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>2</sub>	1 <sup>3</sup> / <sub>4</sub>	2	2 <sup>1</sup> / <sub>4</sub>

**fig. 80-V types A, B and C  
model R, sizes 84 to 110**



NOTE: "B" Dimension is a function of total travel ("G" plus "B" should not be assumed as equal to "C" dimension).

Types A, B and C sizes 84 to 110, for large loads and long travels, provide for basically the same methods of upper attachment as sizes 10 to 83 shown on pages ph-124-126.

**NOTES:** See load travel tables on pages ph-120-123 for "B" dimension.

For weights see page ph-138.

### dimensions (inches)

hanger sizes	total travel	A	C		D	E		G		H	M	N	P	X	factor <sup>a</sup>		J-rod rod diam		
			types A & B	type C		types A & B	type C	types A & B	type C						type A	types B & C	min thd lgth	min	max
84-94	9½ or less	78¾	16	15	49¾	4	4½	1½	1	6	24	10½	3	12	45¾	54¾	10	2	3¾*
	10 or more														55½	64½	13		
95-110	14 or less	100	24	23	64	4	4½	7½	7	6	24	11½	3½	13½	56½	66	12	2½	3¾*
	14½ or more														65¾	74¾	15		

<sup>a</sup> Rod take-out = (factor) minus (.75 × total travel).

### J-Rod — K-Rod — K-Hole Selection Chart

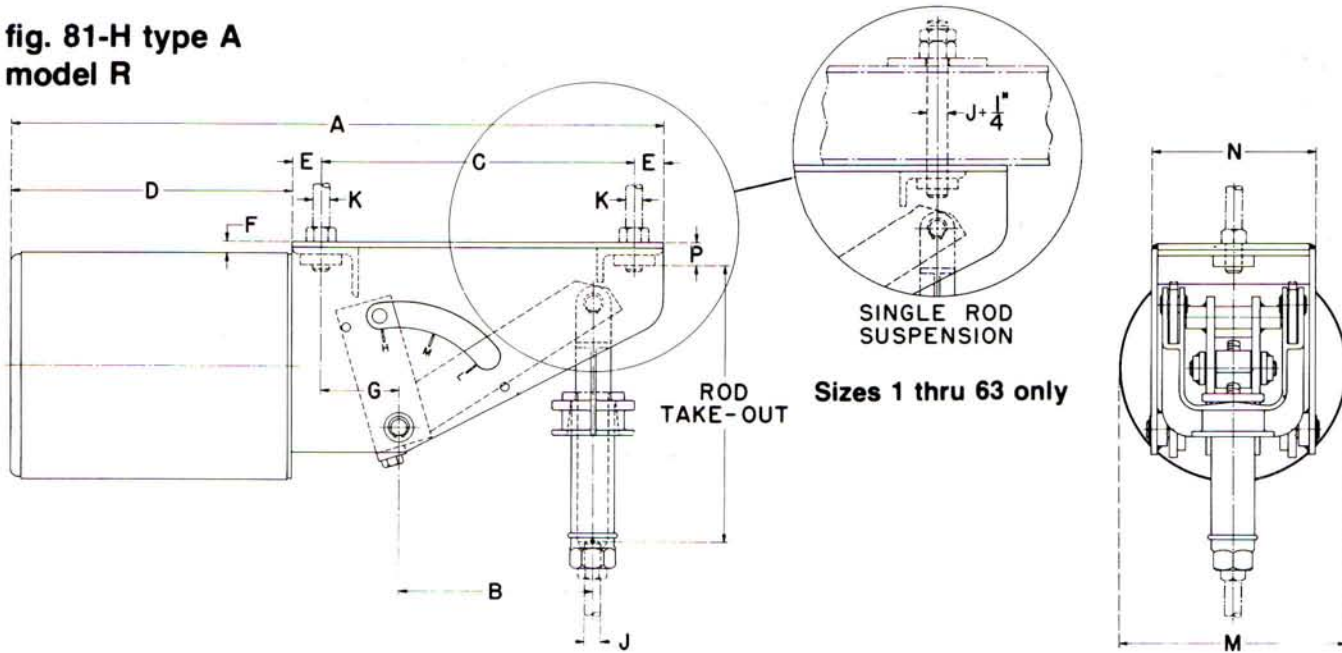
load (lb)	14376 18300	18301 24700	24701 31000	31001 39000	39001 48000	48001 58000	58001 69000	69001 87500
J & K-Rods	2	2¼	2½	2¾	3	3¼*	3½*	3¾*
K-Hole	2¾	2¾	2¾	3⅞	3¾	3¾	3¾	4⅞
R	3	3	4	4	4	4½	4½	4½
S	2¾	3⅞	3¾	3¾	3¾	4⅞	4¾	4¾
T (Type B)	¾	¾	1	1	1	1	1½	1¾
T (Type C)	¾	¾	1	1	1	1	1¼	1¼
W	6	6	8	8	8	9	9	9

\* ¾ and larger are furnished with 8 UN series threads.

# Grinnell

## constant supports

fig. 81-H type A  
model R



Types A of the Figure 81-H Horizontal Design model R Constant Support Hanger is designed for attaching to its supporting member by screwing two rods into tapped holes in the top of the hanger frame a distance equal to the "P" dimension plus 3/8 of an inch. Sizes 1 to 9 are furnished with swivel eye and turnbuckle instead of yoke and coupling.

**NOTES:** Also available for single rod suspension as indicated above. When ordering specify "for single rod suspension."

See load travel tables on pages ph-120-123 for "B" dimension.

For weights see page ph-138.

### dimensions (inches)

hanger sizes	total travel	A	C	D	E	F	G	M	N	P	factor =	J-rod		
												min thread length	min rod diam	max rod diam
1-9	4 or less 4½ or more	13 <sup>15</sup> / <sub>16</sub> 17 <sup>15</sup> / <sub>16</sub>	6 10	8 <sup>7</sup> / <sub>16</sub>	1	7 <sup>7</sup> / <sub>8</sub>	2	6 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>8</sub>	13 <sup>13</sup> / <sub>16</sub>	12 <sup>3</sup> / <sub>4</sub> 15 <sup>5</sup> / <sub>16</sub>	1¾ + TT	½	½
10-18	3½ or less 4 to 5 5½ or more	18 <sup>7</sup> / <sub>16</sub> 18 <sup>7</sup> / <sub>16</sub> 21 <sup>7</sup> / <sub>16</sub>	8 8 11	8 <sup>7</sup> / <sub>16</sub>	1	½	2 <sup>9</sup> / <sub>16</sub>	8 <sup>5</sup> / <sub>16</sub>	6½	11 <sup>11</sup> / <sub>16</sub>	10 <sup>7</sup> / <sub>8</sub> 13 <sup>1</sup> / <sub>4</sub> 13 <sup>3</sup> / <sub>4</sub>	1¾ + TT	½	¾
19-34	5 or less 5½ or more	26 <sup>15</sup> / <sub>16</sub> 31 <sup>1</sup> / <sub>16</sub>	10 14 <sup>1</sup> / <sub>8</sub>	14 <sup>7</sup> / <sub>16</sub>	1¼	5 <sup>5</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>8</sub>	12 <sup>7</sup> / <sub>16</sub>	8 <sup>3</sup> / <sub>8</sub>	1½	16 <sup>3</sup> / <sub>8</sub> 18½	2¾ + TT	½	1¼
35-49	6 or less 6½ or more	31 <sup>9</sup> / <sub>16</sub> 39 <sup>9</sup> / <sub>16</sub>	11 19	17 <sup>7</sup> / <sub>16</sub>	1¾	11 <sup>11</sup> / <sub>16</sub>	4¾	13¾	9 <sup>15</sup> / <sub>16</sub>	1¾	19 <sup>1</sup> / <sub>16</sub> 23 <sup>11</sup> / <sub>16</sub>	3¼ + TT	½	1¾
50-63	8 or less 8½ to 11 11½ or more	45 <sup>9</sup> / <sub>16</sub> 53 <sup>9</sup> / <sub>16</sub> 53 <sup>9</sup> / <sub>16</sub>	16 24 24	26 <sup>3</sup> / <sub>16</sub>	11 <sup>11</sup> / <sub>16</sub>	1 <sup>5</sup> / <sub>16</sub>	7 <sup>11</sup> / <sub>16</sub>	17 <sup>11</sup> / <sub>16</sub>	11¼	1¾	24 <sup>15</sup> / <sub>16</sub> 24 <sup>15</sup> / <sub>16</sub> 30¾	4¼ + TT	¾	2¼
64-74	10½ or less 11 or more	57½ 63	15¾ 21¼	35¾	3	3¼	5¼	22 <sup>3</sup> / <sub>16</sub>	11	3 <sup>7</sup> / <sub>16</sub>	34 <sup>7</sup> / <sub>16</sub> 34 <sup>9</sup> / <sub>16</sub>	5¾ + TT	1¼	2¾
75-83	10½ or less 11 or more	57½ 63	15¾ 20¾	35¾	3¼	3 <sup>5</sup> / <sub>8</sub>	5	27 <sup>3</sup> / <sub>16</sub>	11	4¼	36½ 36 <sup>5</sup> / <sub>8</sub>	5¾ + TT	1½	3¼*
84-110	see page ph-137													

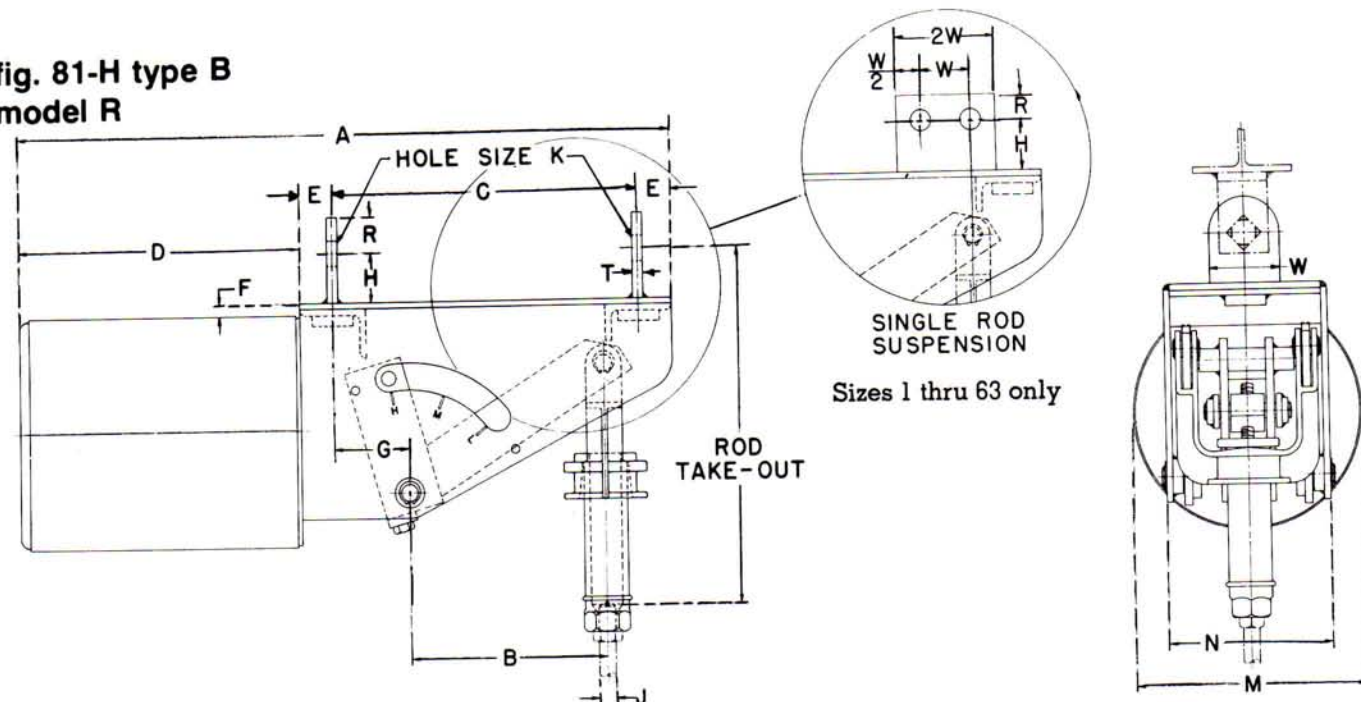
• Rod take-out = (factor) minus  $\left(\frac{\text{total travel}}{2}\right)$

### J-rod — K-rod selection chart

load lb	0	801	1501	2541	4001	6101	9401	13401	18301	24701	31001	39001	48001
	800	1500	2540	4000	6100	9400	13400	18300	24700	31000	39000	48000	58000
rod diam	½	5 <sup>8</sup> / <sub>16</sub>	¾	1	1¼	1½	1¾	2	2¼	2½	2¾	3	3¼*

\* 3¼ inch is furnished with 8 UN series threads.

fig. 81-H type B  
model R



Types B is furnished with two lugs – one at each end of the hanger frame. These lugs permit use of Figure 66 welded beam attachments, clevises or angle clips for attachment where headroom is limited. Sizes 1 to 9 are furnished with swivel eye and turnbuckle instead of yoke and coupling.

**NOTES:** Also available for single rod suspension as indicated above. When ordering specify "for single rod suspension."

See load travel tables on pages ph-120-123 for "B" dimension.

For weights see page ph-138.

**dimensions (inches)**

hanger sizes	total travel	A	C	D	E	F	G	H	M	N	factor	J-rod		
												min thread length	min rod diam	max rod diam
1-9	4 or less 4½ or more	13 <sup>15</sup> / <sub>16</sub> 17 <sup>15</sup> / <sub>16</sub>	5½ 9½	8¾	1¼	7/8	1¾	1½	6¾	4¾	14 <sup>5</sup> / <sub>8</sub> 17 <sup>3</sup> / <sub>16</sub>	1¾ + TT	½	½
10-18	3½ or less 4 to 5 5½ or more	18 <sup>7</sup> / <sub>16</sub> 18 <sup>7</sup> / <sub>16</sub> 21 <sup>7</sup> / <sub>16</sub>	7½ 7½ 10½	8 <sup>7</sup> / <sub>16</sub>	1¼	½	2 <sup>5</sup> / <sub>16</sub>	1½	8 <sup>5</sup> / <sub>16</sub>	6½	13 <sup>1</sup> / <sub>16</sub> 15 <sup>7</sup> / <sub>16</sub> 15 <sup>7</sup> / <sub>16</sub>	1¾ + TT	½	¾
19-34	5 or less 5½ or more	26 <sup>15</sup> / <sub>16</sub> 31 <sup>1</sup> / <sub>16</sub>	9¾ 13 <sup>7</sup> / <sub>8</sub>	14 <sup>7</sup> / <sub>16</sub>	1¾	5/8	3¾	2	12 <sup>7</sup> / <sub>16</sub>	8¾	19 <sup>1</sup> / <sub>2</sub> 21 <sup>5</sup> / <sub>8</sub>	2¾ + TT	½	1¼
35-49	6 or less 6½ or more	31 <sup>9</sup> / <sub>16</sub> 39 <sup>9</sup> / <sub>16</sub>	10½ 18½	17 <sup>1</sup> / <sub>16</sub>	2	1 <sup>1</sup> / <sub>16</sub>	4½	3	13¾	9 <sup>15</sup> / <sub>16</sub>	23 <sup>7</sup> / <sub>16</sub> 28 <sup>1</sup> / <sub>16</sub>	3¼ + TT	½	1¾
50-63	8 or less 8½ to 11 11½ or more	45 <sup>9</sup> / <sub>16</sub> 53 <sup>9</sup> / <sub>16</sub> 53 <sup>9</sup> / <sub>16</sub>	13¾ 21¾ 21¾	26 <sup>3</sup> / <sub>16</sub>	3	1 <sup>5</sup> / <sub>16</sub>	6¾	4	17¾	11¼	30 <sup>11</sup> / <sub>16</sub> 30 <sup>11</sup> / <sub>16</sub> 36	4¼ + TT	¾	2¼
64-74	10½ or less 11 or more	57½ 63	15¼ 20¾	35¾	3¼	3¼	5	4½	22 <sup>3</sup> / <sub>16</sub>	11	42 <sup>3</sup> / <sub>8</sub> 42½	5¾ + TT	1¼	2¾
75-83	10½ or less 11 or more	57½ 63	14¾ 20¼	35¾	3½	3¾	4¾	5	27 <sup>3</sup> / <sub>16</sub>	11	45 <sup>3</sup> / <sub>8</sub> 45 <sup>7</sup> / <sub>8</sub>	5¾ + TT	1½	3¼♦
84-110	see page ph-137													

**J-rod — K-hole selection chart**

load lb	0	801	1501	2541	4001	6101	9401	13401	18301	24701	31001	39001	48001
	800	1500	2540	4000	6100	9400	13400	18300	24700	31000	39000	48000	58000
J-rod	½	5/8	¾	1	1¼	1½	1¾	2	2¼	2½	2¾	3	3¼♦
K-hole size	1 <sup>1</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>16</sub>	1 <sup>5</sup> / <sub>16</sub>	1¼	1½	1¾	2	2¾	2¾	2¾	3½	3¾	3¾
R	1¼	1¼	1¼	1½	2	2½	2½	3	3	4	4	4	4½
T	¼▲	¼▲	¾	½	5/8	¾	¾	¾	¾	1	1	1	1
W	2½	2½	2½	3	4	5	5	6	6	8	8	8	9

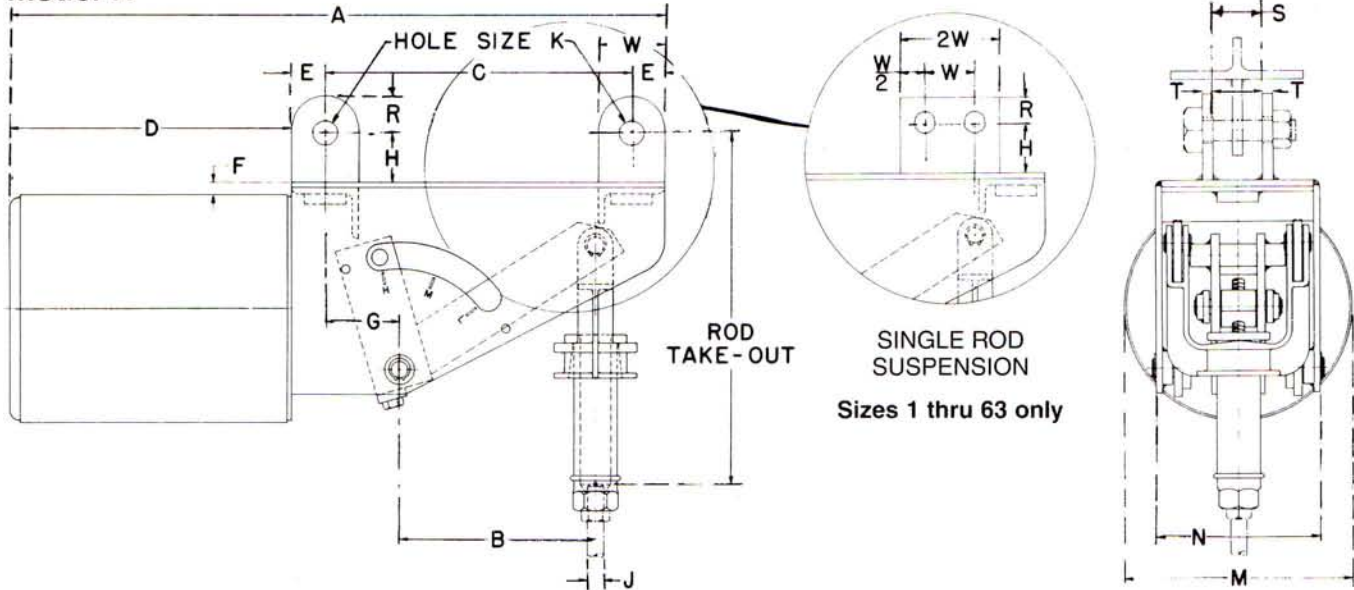
■ Rod take-out = (factor) minus  $\left(\frac{\text{total travel}}{2}\right)$

- ▲ 3/8 inch for single rod suspension.
- ♦ 3/4 inch is furnished with 8 UN series threads.

# Grinnell

## constant supports

fig. 81-H type C  
model R



Types C is furnished with two pair of lugs, one pair of lugs at each end of the hanger frame. These lugs permit the use of two eye rods or two single plates for attachment where headroom is limited. Sizes 1 to 9 are furnished with swivel eye and turnbuckle instead of yoke and coupling.

**NOTES:** Also available for single rod suspension as indicated above. When ordering specify "for single rod suspension."

See load travel tables on pages ph-120-123 for "B" dimension.

For weights see page ph-138.

### dimensions (inches)

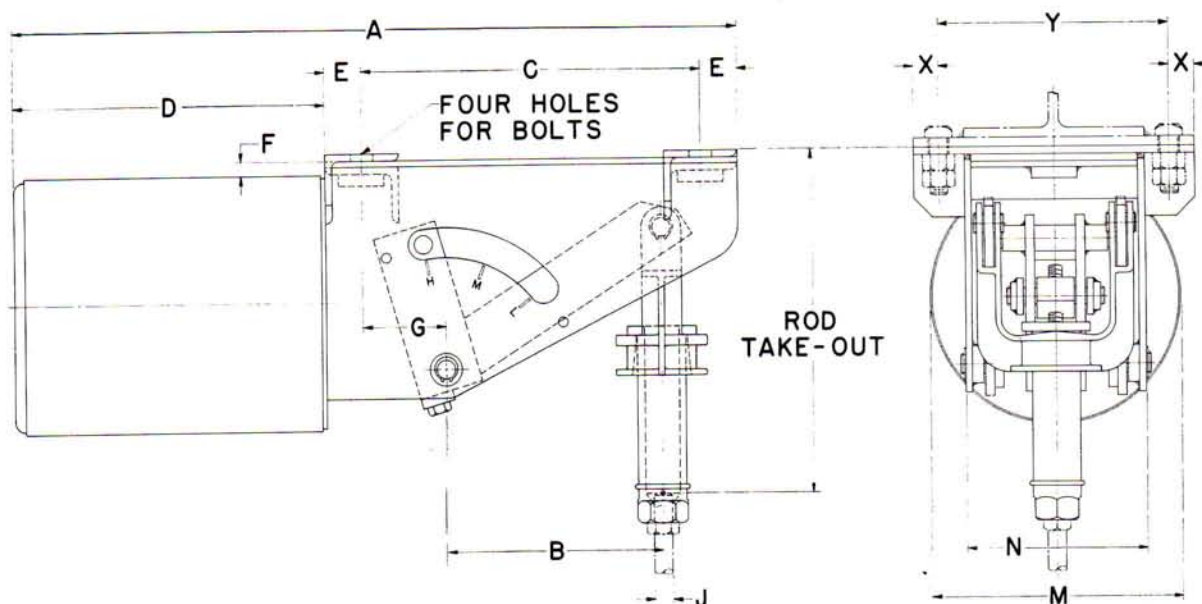
hanger sizes	total travel	A	C	D	E	F	G	H	M	N	factor	J-rod		
												min thread length	min rod diam	max rod diam
1-9	4 or less 4½ or more	13 <sup>15</sup> / <sub>16</sub> 17 <sup>15</sup> / <sub>16</sub>	5½ 9½	8 <sup>7</sup> / <sub>16</sub>	1¼	7 <sup>8</sup> / <sub>16</sub>	1¾	1½	6 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>8</sub>	14 <sup>5</sup> / <sub>8</sub> 17 <sup>3</sup> / <sub>16</sub>	1¾ + TT	½	½
10-18	3½ or less 4 to 5 5½ or more	18 <sup>7</sup> / <sub>16</sub> 18 <sup>7</sup> / <sub>16</sub> 21 <sup>7</sup> / <sub>16</sub>	7½ 7½ 10½	8 <sup>7</sup> / <sub>16</sub>	1¼	½	2 <sup>5</sup> / <sub>16</sub>	1½	8 <sup>5</sup> / <sub>16</sub>	6½	13 <sup>1</sup> / <sub>16</sub> 15 <sup>7</sup> / <sub>16</sub> 15 <sup>7</sup> / <sub>16</sub>	1¾ + TT	½	¾
19-34	5 or less 5½ or more	26 <sup>15</sup> / <sub>16</sub> 31 <sup>1</sup> / <sub>16</sub>	8½ 12 <sup>5</sup> / <sub>8</sub>	14 <sup>7</sup> / <sub>16</sub>	2	5 <sup>8</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>8</sub>	2	12 <sup>7</sup> / <sub>16</sub>	8 <sup>3</sup> / <sub>8</sub>	19 <sup>1</sup> / <sub>2</sub> 21 <sup>5</sup> / <sub>8</sub>	2¾ + TT	½	1¼
35-49	6 or less 6½ or more	31 <sup>9</sup> / <sub>16</sub> 39 <sup>9</sup> / <sub>16</sub>	9½ 17½	17 <sup>1</sup> / <sub>16</sub>	2½	11 <sup>1</sup> / <sub>16</sub>	4	3	13¾	9 <sup>15</sup> / <sub>16</sub>	23 <sup>7</sup> / <sub>16</sub> 28 <sup>1</sup> / <sub>16</sub>	3¼ + TT	½	1¾
50-63	8 or less 8½ to 11 11½ or more	45 <sup>9</sup> / <sub>16</sub> 53 <sup>9</sup> / <sub>16</sub> 53 <sup>9</sup> / <sub>16</sub>	13¾ 21¾ 21¾	26 <sup>3</sup> / <sub>16</sub>	3	1 <sup>5</sup> / <sub>16</sub>	6¾	4	17 <sup>11</sup> / <sub>16</sub>	11¼	30 <sup>11</sup> / <sub>16</sub> 30 <sup>11</sup> / <sub>16</sub> 36	4¼ + TT	¾	2¼
64-74	10½ or less 11 or more	57½ 63	13¾ 19¼	35¾	4	3¼	4¼	4½	22 <sup>3</sup> / <sub>16</sub>	11	42 <sup>3</sup> / <sub>8</sub> 42½	5¾ + TT	1¼	2¾
75-83	10½ or less 11 or more	57½ 63	12¾ 18¼	35¾	4½	3¾	3¾	5	27 <sup>3</sup> / <sub>16</sub>	11	45 <sup>3</sup> / <sub>4</sub> 45 <sup>7</sup> / <sub>8</sub>	5¾ + TT	1½	3¼♦
84-110	see page ph-137													

### J-rod — K-hole selection chart

load lb	0	801	1501	2541	4001	6101	9401	13401	18301	24701	31001	39001	48001
	800	1500	2540	4000	6100	9400	13400	18300	24700	31000	39000	48000	58000
J-rod	½	¾	¾	1	1¼	1½	1¾	2	2¼	2½	2¾	3	3¼♦
K-hole size	1 <sup>1</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>16</sub>	1 <sup>5</sup> / <sub>16</sub>	1¼	1½	1¾	2	2¾	2¾	2¾	3½	3¾	3¾
R	1¼	1¼	1¼	1½	2	2½	2½	3	3	4	4	4	4½
S	7 <sup>8</sup> / <sub>16</sub>	1 <sup>1</sup> / <sub>16</sub>	1¼	1¾	2	2¾	2¾	2¾	3½	3¾	3¾	3¾	4½
T	¼▲	¼▲	¾	½	5 <sup>8</sup> / <sub>16</sub>	¾	¾	¾	¾	1	1	1	1
W	2½	2½	2½	3	4	5	5	6	6	8	8	8	9

▲ Rod take-out = (factor) minus  $\frac{\text{total travel}}{2}$       ▲ ¾ inch for single rod suspension. ♦ 3¼ inch is furnished with 8 UN series threads.

fig. 81-H type D  
model R



Types D may be bolted directly under steel. Sizes 1 to 9 are furnished with swivel eye and turnbuckle instead of yoke and coupling.

**NOTES:** See load travel tables on pages ph-120-123 for "B" dimension.

For weights see page ph-138.

### dimensions (inches)

hanger sizes	total travel	A	C	D	E	F	G	M	N	X	Y	angle size	bracket hole diameter	factor	J-rod		
															min thread length	min rod diam	max rod diam
1-9	4 or less 4½ or more	13 <sup>15</sup> / <sub>16</sub> 17 <sup>15</sup> / <sub>16</sub>	6 10	5 <sup>15</sup> / <sub>16</sub>	1	7/8	2	6 <sup>1</sup> / <sub>8</sub>	4 <sup>1</sup> / <sub>8</sub>	¾	5 <sup>1</sup> / <sub>8</sub>	2x2x¼	9/16	13 <sup>3</sup> / <sub>8</sub> 15 <sup>15</sup> / <sub>16</sub>	1¾ + TT	½	½
10-18	3½ or less 4 to 5 5½ or more	18 <sup>7</sup> / <sub>16</sub> 18 <sup>7</sup> / <sub>16</sub> 21 <sup>7</sup> / <sub>16</sub>	8 8 11	8 <sup>7</sup> / <sub>16</sub>	1	½	2 <sup>9</sup> / <sub>16</sub>	8 <sup>5</sup> / <sub>16</sub>	6 <sup>1</sup> / <sub>2</sub>	7/8	8	2x2x¼	¾	11 <sup>13</sup> / <sub>16</sub> 14 <sup>3</sup> / <sub>16</sub> 14 <sup>3</sup> / <sub>16</sub>	1¾ + TT	½	¾
19-34	5 or less 5½ or more	26 <sup>15</sup> / <sub>16</sub> 31 <sup>1</sup> / <sub>16</sub>	9½ 13¾	14 <sup>7</sup> / <sub>16</sub>	1½	¾	3¾	12 <sup>7</sup> / <sub>16</sub>	8¾	1½	10¾	2x3x¼	¾	17¾ 19 <sup>7</sup> / <sub>8</sub>	2¾ + TT	½	1¼
35-49	6 or less 6½ or more	31 <sup>9</sup> / <sub>16</sub> 39 <sup>9</sup> / <sub>16</sub>	10½ 18½	17 <sup>1</sup> / <sub>16</sub>	2	1 <sup>1</sup> / <sub>16</sub>	4½	13¾	9 <sup>15</sup> / <sub>16</sub>	1¾	12¾	3x4x¾	7/8	20 <sup>13</sup> / <sub>16</sub> 25 <sup>7</sup> / <sub>16</sub>	3¼ + TT	½	1¾
50-63	8 or less 8½ to 11 11½ or more	45 <sup>9</sup> / <sub>16</sub> 53 <sup>9</sup> / <sub>16</sub> 53 <sup>9</sup> / <sub>16</sub>	15¾ 23¾ 23¾	26 <sup>3</sup> / <sub>16</sub>	2	1 <sup>5</sup> / <sub>16</sub>	7¾	17 <sup>11</sup> / <sub>16</sub>	11¼	1¾	14¾	4x4x¾	1¾	27 <sup>1</sup> / <sub>16</sub> 27 <sup>1</sup> / <sub>16</sub> 32¾	4¼ + TT	¾	2¼
64-74	10½ or less 11 or more	57½ 63	15¾ 21¼	35¾	3	3¼	5¼	22 <sup>3</sup> / <sub>16</sub>	11	2	15	4x6x½	1¾	38¾ 38½	5¾ + TT	1¼	2¾
75-83	10½ or less 11 or more	57½ 63	15¾ 21¼	35¾	3	3¾	4¾	27 <sup>3</sup> / <sub>16</sub>	11	2	15	4x6x½	1¾	41¼ 41¾	5¾ + TT	1½	3¼*
84-110	not available																

• Rod take-out = (factor) minus  $\left(\frac{\text{total travel}}{2}\right)$

### J-rod selection chart

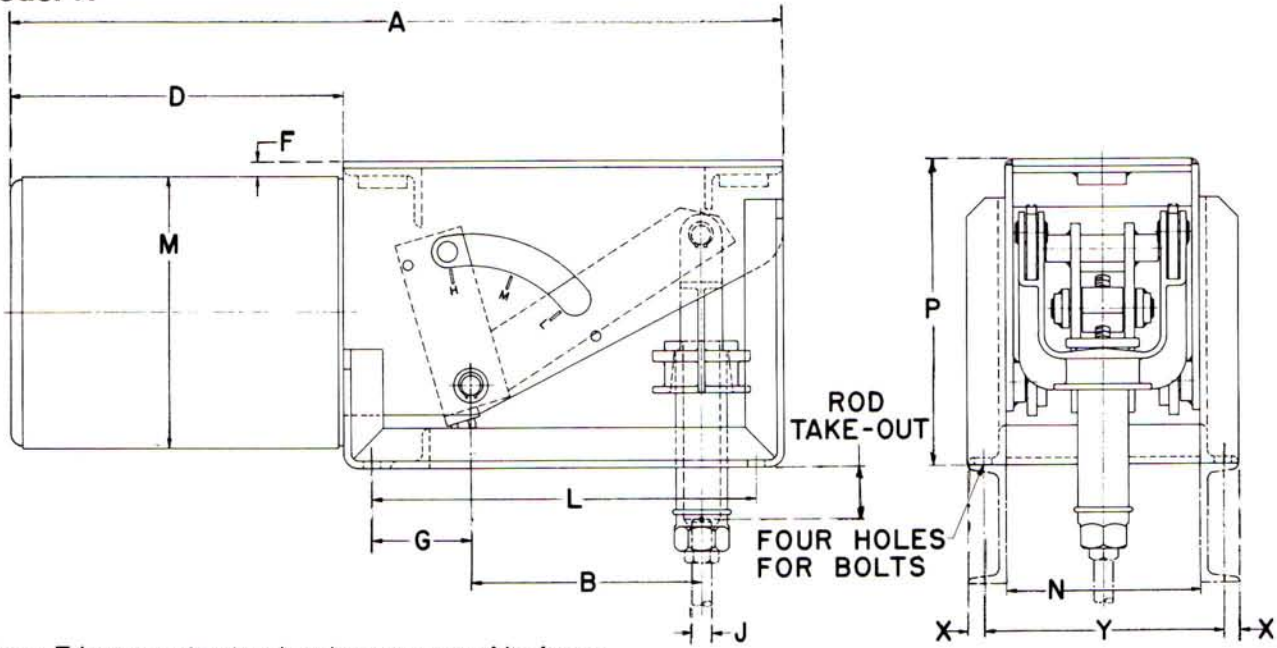
load lb	0	801	1501	2541	4001	6101	9401	13401	18301	24701	31001	39001	48001
	800	1500	2540	4000	6100	9400	13400	18300	24700	31000	39000	48000	58000
rod diam	½	¾	¾	1	1¼	1½	1¾	2	2¼	2½	2¾	3	3¼*

• ¾ inch is furnished with 8 UN series threads.

# Grinnell

## constant supports

fig. 81-H type E  
model R



Types E incorporates two brackets as part of its frame, permitting the bolting of the constant support to the top of structural steel. Sizes 1 to 9 are furnished with swivel eye and turnbuckle instead of yoke and coupling.

If rod take-out does not exceed the depth of the supporting steel and rod coupling is required to extend

below the steel, specify the depth of the supporting steel. Increase rod take-out by the depth of the steel.

**NOTES:** See load travel tables on pages ph-120-123 for "B" dimension.

For weights see page ph-138.

### dimensions (inches)

hanger sizes	total travel	A	D	F	G	L	M	N	P	X	Y	angle size	bracket hole diameter	factor	J-rod		
															min thread length	min rod diam	max rod diam
1-9	4 or less 4½ or more	13 <sup>15</sup> / <sub>16</sub> 17 <sup>15</sup> / <sub>16</sub>	5 <sup>15</sup> / <sub>16</sub>	1 <sup>5</sup> / <sub>16</sub>	2	6 10	6 <sup>5</sup> / <sub>8</sub>	4 <sup>5</sup> / <sub>8</sub>	8 <sup>1</sup> / <sub>16</sub>	5 <sup>5</sup> / <sub>8</sub>	5 <sup>15</sup> / <sub>16</sub>	1½x1½x¼	9/16	5/8 7 <sup>11</sup> / <sub>16</sub>	1¾ + TT	½	½
10-18	3½ or less 4 to 5 5½ or more	18 <sup>7</sup> / <sub>16</sub> 18 <sup>7</sup> / <sub>16</sub> 21 <sup>7</sup> / <sub>16</sub>	8 <sup>7</sup> / <sub>16</sub>	9 <sup>9</sup> / <sub>16</sub>	2 <sup>5</sup> / <sub>16</sub>	7½ 7½ 10½	8 <sup>5</sup> / <sub>16</sub>	6½	9 <sup>5</sup> / <sub>8</sub>	5 <sup>5</sup> / <sub>8</sub>	8 <sup>1</sup> / <sub>16</sub>	1½x1½x¼	¾	1¾ 4 <sup>1</sup> / <sub>16</sub> 4 <sup>1</sup> / <sub>16</sub>	1¾ + TT	½	¾
19-34	5 or less 5½ or more	26 <sup>15</sup> / <sub>16</sub> 31 <sup>1</sup> / <sub>16</sub>	14 <sup>7</sup> / <sub>16</sub>	1 <sup>11</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>8</sub>	10 14 <sup>1</sup> / <sub>8</sub>	12 <sup>7</sup> / <sub>16</sub>	8 <sup>3</sup> / <sub>8</sub>	14 <sup>1</sup> / <sub>8</sub>	5 <sup>5</sup> / <sub>8</sub>	10 <sup>3</sup> / <sub>16</sub>	1½x1½x¼	¾	3 <sup>3</sup> / <sub>8</sub> 5½	2¾ + TT	½	1¼
35-49	6 or less 6½ or more	31 <sup>9</sup> / <sub>16</sub> 39 <sup>9</sup> / <sub>16</sub>	17 <sup>1</sup> / <sub>16</sub>	¾	5 <sup>1</sup> / <sub>16</sub>	11 <sup>5</sup> / <sub>8</sub> 19 <sup>5</sup> / <sub>8</sub>	13¾	9 <sup>15</sup> / <sub>16</sub>	15½	1 <sup>3</sup> / <sub>16</sub>	12 <sup>3</sup> / <sub>8</sub>	2 x2 x¾	7/8	4 <sup>7</sup> / <sub>8</sub> 9½	3¼ + TT	½	1¾
50-63	8 or less 8½ to 11 11½ or more	45 <sup>9</sup> / <sub>16</sub> 53 <sup>9</sup> / <sub>16</sub> 53 <sup>9</sup> / <sub>16</sub>	26 <sup>3</sup> / <sub>16</sub>	1 <sup>5</sup> / <sub>16</sub>	7 <sup>3</sup> / <sub>8</sub>	15 <sup>5</sup> / <sub>8</sub> 23 <sup>3</sup> / <sub>8</sub> 23 <sup>3</sup> / <sub>8</sub>	17 <sup>11</sup> / <sub>16</sub>	11¼	19¾	1 <sup>5</sup> / <sub>16</sub>	14 <sup>11</sup> / <sub>16</sub>	3 x3 x¾	1 <sup>3</sup> / <sub>8</sub>	6 <sup>7</sup> / <sub>8</sub> 6 <sup>7</sup> / <sub>8</sub> 12¼	4¼ + TT	¾	2¼
64-74	10½ or less 11 or more	57½ 63	35¾	3 <sup>5</sup> / <sub>16</sub>	6 <sup>5</sup> / <sub>8</sub>	17½ 23	22 <sup>3</sup> / <sub>16</sub>	11	26 <sup>3</sup> / <sub>8</sub>	1 <sup>9</sup> / <sub>16</sub>	14 <sup>15</sup> / <sub>16</sub>	3½x3½x¾	1 <sup>5</sup> / <sub>8</sub>	11 <sup>5</sup> / <sub>8</sub> 11¼	5¾ + TT	1¼	2¾
75-83	10½ or less 11 or more	57½ 63	35¾	3 <sup>11</sup> / <sub>16</sub>	6 <sup>5</sup> / <sub>8</sub>	17½ 23	27 <sup>3</sup> / <sub>16</sub>	11	31 <sup>3</sup> / <sub>8</sub>	1 <sup>9</sup> / <sub>16</sub>	14 <sup>15</sup> / <sub>16</sub>	3½x3½x¾	1 <sup>5</sup> / <sub>8</sub>	9 9 <sup>5</sup> / <sub>8</sub>	5¾ + TT	1½	3¼*

84-110 | see page ph-137

■ Rod take-out = (factor) minus  $\left(\frac{\text{total travel}}{2}\right)$

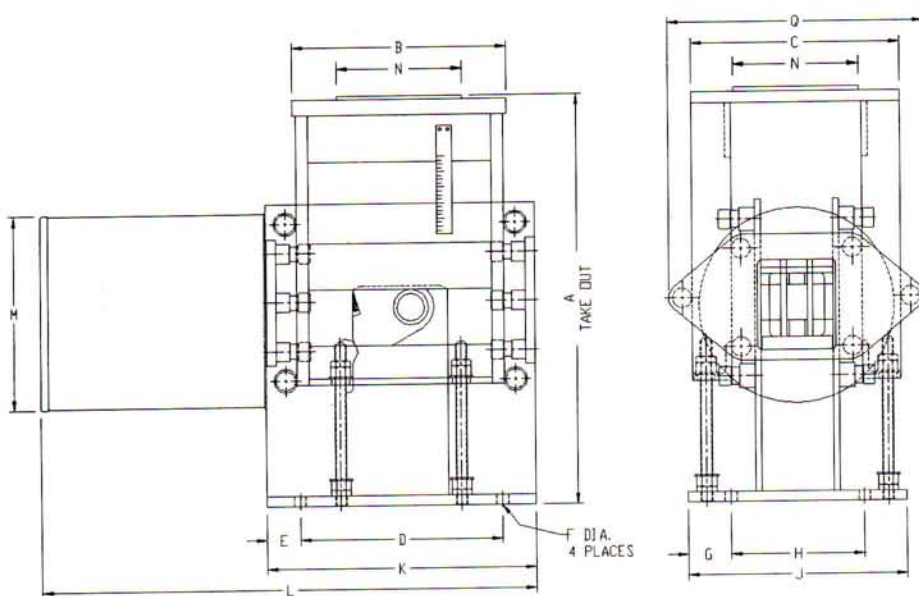
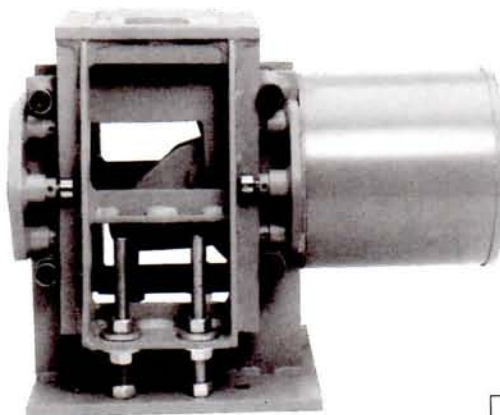
### J-rod selection chart

load lb	0	801	1501	2541	4001	6101	9401	13401	18301	24701	31001	39001	48001
	800	1500	2540	4000	6100	9400	13400	18300	24700	31000	39000	48000	58000
rod diam	½	¾	¾	1	1¼	1½	1¾	2	2¼	2½	2¾	3	3¼*

\* 3¼ inch is furnished with 8 UN series threads.



fig. 81-H type F upthrust



T.T.	TAKE-OUT FACTOR* "A"			
	SIZES			
	10-18	19-34	35-49	50-63
2	16.12	23.12	-	-
2.5	16.12	23.12	25.75	-
3	16.12	23.12	25.75	29.00
3.5	16.12	23.12	25.75	29.00
4	19.94	23.12	25.75	29.00
4.5	19.94	23.12	25.75	29.00
5	19.94	23.12	25.75	29.00
5.5	19.94	27.50	25.75	29.00
6	19.94	27.50	25.75	29.00
6.5	-	27.50	31.62	29.00
7	-	27.50	31.62	34.00
7.5	-	27.50	31.62	34.00
8	-	27.50	31.62	34.00
8.5	-	-	31.62	34.00
9	-	-	31.62	34.00
9.5	-	-	31.62	34.00
10	-	-	31.62	34.00

\*For Down Travel: Take-Out = "A" + (1/2) Actual Travel  
For Up Travel: Take-Out = "A" - (1/2) Actual Travel

The Upthrust is for support of piping or equipment from below. It has a base flange for fastening to the floor or beams. The load is supported during hydrostatic testing by means of (4) positioning studs. After testing the nuts are moved to either end of the stud to prevent interference during operation.

The Upthrust Constant Support is available for loads up to 24463 lbs.

Corrosion resistant units are available either galvanized or carbon-zinc painted.

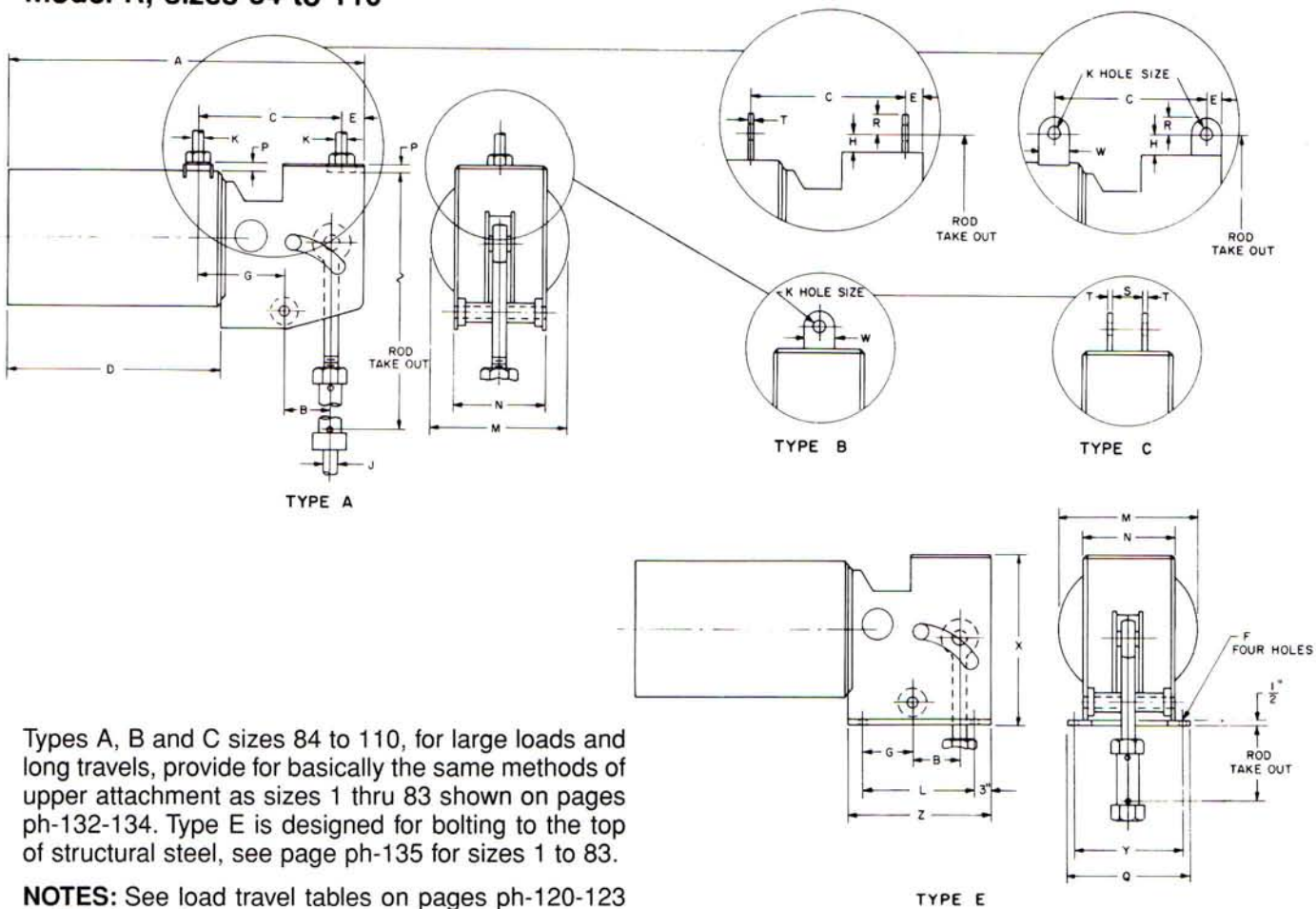
### dimensions (inches)

SIZE	TOTAL TRAVEL	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
10-18	2-6	TAKE OUT	10 <sup>7</sup> / <sub>8</sub>	11 <sup>7</sup> / <sub>8</sub>	9	2 <sup>1</sup> / <sub>2</sub>	3 <sup>3</sup> / <sub>4</sub>	2	8	12	14	22 <sup>7</sup> / <sub>16</sub>	8 <sup>1</sup> / <sub>4</sub>	5	1 <sup>1</sup> / <sub>2</sub>	14 <sup>3</sup> / <sub>4</sub>
19-34	2-8		13 <sup>3</sup> / <sub>4</sub>	13 <sup>3</sup> / <sub>4</sub>	13	2 <sup>1</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>4</sub>	2	10	14	17 <sup>1</sup> / <sub>4</sub>	31 <sup>5</sup> / <sub>8</sub>	12 <sup>1</sup> / <sub>2</sub>	8	5 <sup>5</sup> / <sub>8</sub>	16 <sup>5</sup> / <sub>8</sub>
35-49	2 <sup>1</sup> / <sub>2</sub> -10		17 <sup>7</sup> / <sub>8</sub>	16 <sup>1</sup> / <sub>4</sub>	17	2	7 <sup>7</sup> / <sub>8</sub>	2	13	17	21	38 <sup>1</sup> / <sub>4</sub>	13 <sup>5</sup> / <sub>8</sub>	8	3 <sup>3</sup> / <sub>4</sub>	19 <sup>3</sup> / <sub>4</sub>
50-63	3-10		21 <sup>5</sup> / <sub>8</sub>	19 <sup>1</sup> / <sub>4</sub>	16 <sup>1</sup> / <sub>2</sub>	1 <sup>5</sup> / <sub>16</sub>	7 <sup>7</sup> / <sub>8</sub>	3 <sup>3</sup> / <sub>8</sub>	11 <sup>3</sup> / <sub>4</sub>	19	22 <sup>7</sup> / <sub>16</sub>	52	17 <sup>7</sup> / <sub>8</sub>	10	3 <sup>3</sup> / <sub>4</sub>	23 <sup>1</sup> / <sub>4</sub>

# Grinnell

## constant supports

fig. 81-H, types A, B, C and E  
model R, sizes 84 to 110



Types A, B and C sizes 84 to 110, for large loads and long travels, provide for basically the same methods of upper attachment as sizes 1 thru 83 shown on pages ph-132-134. Type E is designed for bolting to the top of structural steel, see page ph-135 for sizes 1 to 83.

**NOTES:** See load travel tables on pages ph-120-123 for "B" dimension.

For weights see page ph-138.

### dimensions (inches)

hanger sizes	total travel	C		E			G		factors										J-rod						
		A	types A & B	type C	D	types A & B	type C	F	types A, B & C	type E	H	L	M	N	P	Q	X	Y	Z	type A	types B & C	type E	min thd length	rod diam min max	
84-94	9½ or less 10 or more	76¾	28	27½	49¾	4	4½	1½	14	6	6	21	24	10½	3	16	34	13	27	52%	61%	21%	10	2	3¼*
95-110	14 or less 14½ or more	100	49	48½	64	4	4½	1¾	28¾	8¾	6	30	24	11½	3½	17	37	14½	36	51%	60%	17%	12	2½	3¼*

\* Rod take-out = (factor) minus (.75 × total travel).

### J-rod — K-rod — K-hole selection chart

load (lb)	14376 18300	18301 24700	24701 31000	31001 39000	39001 48000	48001 58000	58001 69000	69001 87500
J & K-rods	2	2¼	2½	2¾	3	3¼*	3½*	3¾*
K-hole	2¾	2¾	2¾	3½	3¾	3¾	3¾	4½
R	3	3	4	4	4	4½	4½	4½
S	2¾	3½	3¾	3¾	3¾	4½	4¾	4¾
T (type B)	¾	¾	1	1	1	1	1½	1¾
T (type C)	¾	¾	1	1	1	1	1¼	1¼
W	6	6	8	8	8	9	9	9

\* ¾ and larger are furnished with 8 UN series threads.

constant supports

weights (approx) lb, each

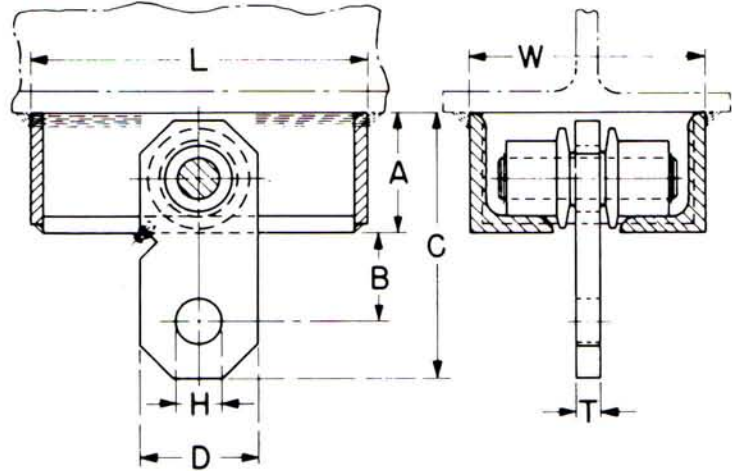
hanger sizes	fig 80-V			fig 81-H		hanger sizes	fig 80-V			fig 81-H	
	types A,B,C,D,E		type G	types A,B,C,D,E			types A,B,C,D,E		type G	types A,B,C,D,E	
	net	shipping	net	net	shipping		net	shipping	net	net	shipping
1	....	....	....	18	20	56	665	725	1406	575	635
2	....	....	....	18	20	57	665	725	1406	575	635
3	....	....	....	18	20	58	706	766	1488	616	676
4	....	....	....	21	23	59	706	766	1488	616	676
5	....	....	....	21	23	60	706	766	1488	616	676
6	....	....	....	21	23	61	745	805	1566	655	715
7	....	....	....	23	25	62	745	805	1566	655	715
8	....	....	....	23	25	63	745	805	1566	655	715
9	....	....	....	23	25	64	1468	1568	....	1225	1325
10	62	67	160	52	57	65	1468	1568	....	1225	1325
11	62	67	160	52	57	66	1568	1668	....	1325	1425
12	62	67	160	52	57	67	1568	1668	....	1325	1425
13	65	70	166	55	60	68	1568	1668	....	1325	1425
14	65	70	166	55	60	69	1653	1753	....	1410	1510
15	65	70	166	55	60	70	1653	1753	....	1410	1510
16	70	75	176	60	65	71	1653	1753	....	1410	1510
17	70	75	176	60	65	72	1753	1853	....	1520	1620
18	70	75	176	60	65	73	1753	1853	....	1520	1620
19	163	171	371	150	158	74	1753	1853	....	1520	1620
20	163	171	371	150	158	75	2360	2460	....	1970	2070
21	165	173	375	152	160	76	2360	2460	....	1970	2070
22	165	173	375	152	160	77	2360	2460	....	1970	2070
23	165	173	375	152	160	78	2430	2530	....	2020	2120
24	172	180	389	159	167	79	2430	2530	....	2020	2120
25	172	180	389	159	167	80	2430	2530	....	2020	2120
26	172	180	389	159	167	81	2570	2670	....	2180	2280
27	180	188	405	167	175	82	2570	2670	....	2180	2280
28	180	188	405	167	175	83	2570	2670	....	2180	2280
29	180	188	405	167	175	84	2725	2845	....	2310	2430
30	187	195	419	174	182	85	2725	2845	....	2310	2430
31	187	195	419	174	182	86	2870	2990	....	2455	2575
32	187	195	419	174	182	87	2870	2990	....	2455	2575
33	195	203	435	182	190	88	2870	2990	....	2455	2575
34	195	203	435	182	190	89	3070	3190	....	2655	2775
35	300	312	676	280	292	90	3070	3190	....	2655	2775
36	300	312	676	280	292	91	3155	3275	....	2740	2860
37	300	312	676	280	292	92	3155	3275	....	2740	2860
38	315	327	706	295	307	93	3255	3375	....	2840	2960
39	315	327	706	295	307	94	3255	3375	....	2840	2960
40	315	327	706	295	307	95	4350	4500	....	3925	4075
41	332	344	740	312	324	96	4350	4500	....	3925	4075
42	332	344	740	312	324	97	4350	4500	....	3925	4075
43	332	344	740	312	324	98	4350	4500	....	3925	4075
44	343	355	762	323	335	99	4675	4825	....	4250	4400
45	343	355	762	323	335	100	4675	4825	....	4250	4400
46	343	355	762	323	335	101	4675	4825	....	4250	4400
47	360	372	796	340	352	102	4675	4825	....	4250	4400
48	360	372	796	340	352	103	5300	5450	....	4875	5025
49	360	372	796	340	352	104	5300	5450	....	4875	5025
50	601	661	1278	511	571	105	5300	5450	....	4875	5025
51	601	661	1278	511	571	106	5300	5450	....	4875	5025
52	626	686	1328	536	596	107	5800	5950	....	5350	5500
53	626	686	1328	536	596	108	5800	5950	....	5350	5500
54	626	686	1328	536	596	109	5800	5950	....	5350	5500
55	665	725	1406	575	635	110	5800	5950	....	5350	5500

■ Based on 3'-0" C-C rod dimension and 8 inch total travel.

# Grinnell

## horizontal traveler

horizontal traveler  
fig. 170



The Grinnell Fig. 170 Horizontal Traveler facilitates the supporting of piping systems subject to linear horizontal movements where head room is limited. Designed for use with Grinnell Pre-Engineered Variable Spring Hangers or Constant Supports it can also be used in conjunction with a rigid type hanger assembly.

### FEATURES:

- Highly economical
- Minimum friction
- Virtually dust proof
- Compact — designed for minimum head room
- Versatile

**SIZE RANGE:** Available in four sizes to take loads to 20,700 lbs. All sizes provide for 12 inches of horizontal travel.

**APPROVALS:** Complies with Manufacturers Standardization Society SP-69 (Type 58).

**INSTALLATION:** Shipped ready for installation. Attach to the supporting steel by welding around the frame. Spring hanger may be bolted or welded to the load plate.

**MAINTENANCE:** Ball bushing should be greased semi-annually through fitting provided.

**ORDERING:** Specify size number, figure number, name and H dimension, if required. Horizontal travelers will be designed for special loads, travels or dual directional travel upon request.

### loads • weights • dimensions (inches)

size no.	maximum recom load, lbs	weight (approx) lb, each	A	B	C	D	H max	L	T	W
1	3770	15	2½	1½	5½	2½	1½	15½	¾	4½
2	6230	37	3½	2½	7½	3½	1¾	16¾	¾	6 <sup>7</sup> / <sub>8</sub>
3	11630	69	5	3	10½	5	1¾	17¾	1	8 <sup>7</sup> / <sub>16</sub>
4	20700	102	6	3½	12½	6	2¾	19½	1½	9½

## vibration control and sway brace

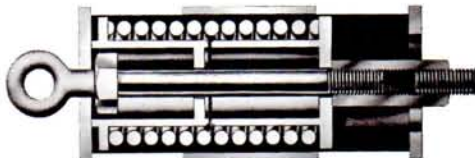
**fig. 296**  
**with adjustable preload: fig. 301**  
**corrosion resistant: fig. C-296, fig. C-301**



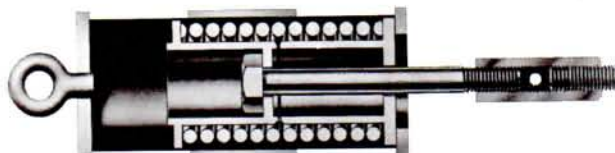
*the Grinnell vibration control and sway brace presents a neat, compact appearance*



*cut-away section shows simplicity of exclusive single spring design*



*deflection of single spring occurs when thrust exceeds pre-compression*



*tension causes deflection of single spring in opposite direction*

*above exhibits are fig. 296*

**SIZE RANGE:** Preloads from 50 to 1800 pounds and maximum forces from 200 to 7200 pounds.

**SERVICE:** Recommended for controlling vibration; absorbing shock loading; guiding or restraining the movement of pipe resulting from thermal expansion; bracing a pipe line against sway.

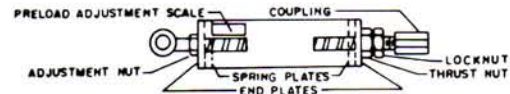
**APPROVALS:** Complies with Federal Specification WW-H-171 E (Type 55) and Manufacturers Standardization Society SP-69 (Type 50).

**SPECIFICATIONS:** Fulfills the requirements of the ASME Code for Pressure Piping as to fabrication details and materials.

**INSTALLATION:** Shipped ready for installation (see line cuts of fig. 297, fig. 298, fig. 302 and fig. 303 on page 151 for typical installed hanger assemblies).

**ADJUSTMENT:** The sway brace should be in the neutral position when the system is Hot and operating, at which time both spring plates should be in contact with the end plates. If they are not, the sway brace should be adjusted to the neutral position by use of the load coupling.

**PRELOAD ADJUSTMENT — FIG. 301:** Turn the preload adjustment nut until desired preload is indicated. Turn thrust nut until it is in contact with the spring plate. Lock in position. Indicated deflection must be greater than thermal movement.



### FEATURES:

- Vibration is opposed with an instantaneous counter force bringing the pipe back to normal position.
- A single pre-loaded spring provides two way action.
- One spring saves space and simplifies design.
- Spring has 3-inch travel in either direction.
- Accurate neutral adjustment assured.

### ADDITIONAL FEATURE — FIG. 301:

- The fig. 301 sway brace is adjustable from the initial preload to the maximum capacity of the unit selected. It is equipped with a load-deflection scale to facilitate preload adjustment.

**ORDERING:** Specify figure, name, sway brace size. The Grinnell fig. 296 and fig. 301 consist of the vibration control and sway brace only. Available corrosion resistant as fig. C-296 and fig. C-301.

**FINISH:** Standard finish; painted with semi gloss primer. Corrosion resistant; galvanized with neoprene coated coil.

# Grinnell

## sway brace

**SIZE SELECTION:** The Grinnell vibration control and sway brace gives full deflection forces from 200 to 7200 pounds and has initial precompressed spring forces from 50 to 1800 pounds to control vibrations and pipe sway.

The exact amount of energy needed to control piping should be in proportion to the mass, amplitude of movement, and nature of disturbing forces acting on the pipe. When it is possible to calculate the exact restraining force required, the size of the vibration control and sway brace capable of providing this force should be selected.

To simplify the selection of size, Grinnell engineers have designed the vibration and control and sway brace in six sizes that are readily related to nominal pipe size. For pipe sizes  $3\frac{1}{2}$ -inch and smaller, the size no. 1 is recommended; for 4 to 8-inch, the size no. 2; for 10 to 16-inch, the size no. 3; and for 18 to 24-inch the size no. 4. Size numbers 5 and 6 are available for larger pipe sizes.

**INSTALLATION:** (1) Attach rear bracket to structure and pipe attachment to piping or equipment. (2) Connect coupling to pipe attachment and turn coupling so that spring is compressed in direction opposite to and by approximate amount of piping thermal movement.

**IMPORTANT:** FINAL ADJUSTMENT should be made with the pipe in its Hot or operating position. Turn the coupling until both spring plates are in contact with the end plates of the sway brace.

When correct tension adjustments are completed, the brace exerts no force on the pipe in its operating position. Under shutdown conditions, the brace allows the pipe to assume its cold position. It exerts a nominal cold strain force equal to the pre-load force plus the amount of travel from the hot to cold position, times the spring scale of the particular size of the vibration control and sway brace.

fig. 296

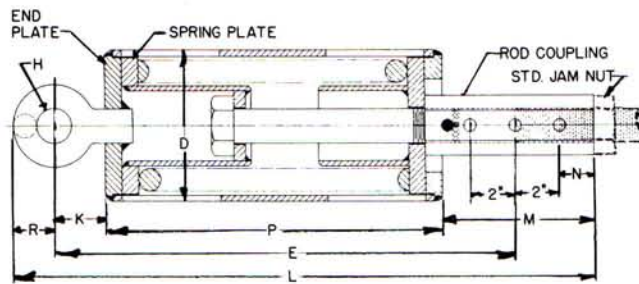
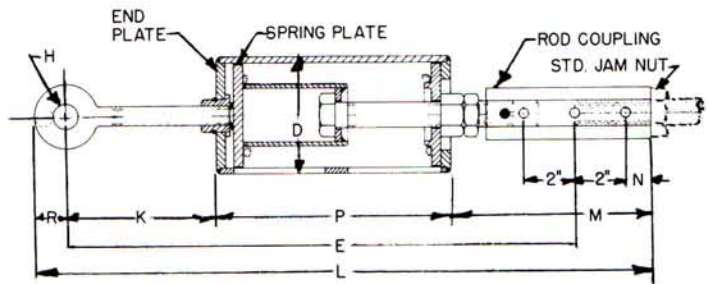


fig. 301



loads • weights • dimensions (inches)

fig. 296

sway brace size	for pipe size	preload and spring scale lb/in	max force, lb	weight (approx) each, lb	rod size, fig. 297■	pipe size, fig. 298■	eye, H		D	rod take-out E	K	L	M	N	P	R
							diam hole	thick-ness								
1	2 to 3½	50	200	22	¾	1½	1	¾	4½	13⅝	1⅝	17⅞	6⅞	1	8⅞	1¼
2	4 to 8	150	600	25	1	2	1	¾	4½	14⅜	1⅝	18⅝	6⅞	1	9⅝	1¼
3	10 to 16	450	1800	36	1	2	1	¾	4½	17¾	1⅝	22	6⅞	1	13	1¼
4	18 to 24	900	3600	64	1¼	2	1½	1½	6⅝	17	2¼	22⅝ <sup>16</sup>	6¾	1½	11½	1 <sup>13</sup> / <sub>16</sub>
5	▲	1350	5400	79	1½	2½	1½	1½	6⅝	18½	2¼	23 <sup>13</sup> / <sub>16</sub>	6¾	1½	13	1 <sup>13</sup> / <sub>16</sub>
6	▲	1800	7200	95	1½	2½	1½	1½	6⅝	20½	2¼	25 <sup>13</sup> / <sub>16</sub>	6¾	1½	15	1 <sup>13</sup> / <sub>16</sub>

fig. 301

sway brace size	for pipe size	preload and spring scale lb/in	max force, lb	weight (approx) each, lb	rod size, fig. 302■	pipe size, fig. 303■	eye, H		D	rod take-out E	K, max	L	M, min	N	P	R
							diam hole	thick-ness								
1	2 to 3½	50	200	23	¾	1½	1	¾	4½	20	5 <sup>15</sup> / <sub>16</sub>	24¼	7⅞	1	9 <sup>3</sup> / <sub>16</sub>	1¼
2	4 to 8	150	600	26	1	2	1	¾	4½	20¾	5 <sup>15</sup> / <sub>16</sub>	25	7⅞	1	9 <sup>15</sup> / <sub>16</sub>	1¼
3	10 to 16	450	1800	38	1	2	1	¾	4½	24⅞	5 <sup>15</sup> / <sub>16</sub>	28⅜	7⅞	1	13 <sup>5</sup> / <sub>16</sub>	1¼
4	18 to 24	900	3600	67	1¼	2	1½	1½	6⅝	24 <sup>5</sup> / <sub>16</sub>	6 <sup>9</sup> / <sub>16</sub>	29⅝	9¼	1½	12	1 <sup>13</sup> / <sub>16</sub>
5	▲	1350	5400	82	1½	2½	1½	1½	6⅝	25 <sup>13</sup> / <sub>16</sub>	6 <sup>9</sup> / <sub>16</sub>	31⅞	9¼	1½	13½	1 <sup>13</sup> / <sub>16</sub>
6	▲	1800	7200	98	1½	2½	1½	1½	6⅝	27 <sup>13</sup> / <sub>16</sub>	6 <sup>9</sup> / <sub>16</sub>	33⅞	9¼	1½	15½	1 <sup>13</sup> / <sub>16</sub>

▲ As specified by customer.

■ See page ph-142

## vibration control and sway brace

### assemblies

fig. 297 and fig. 298

with adjustable preload: fig. 302 and fig. 303

corrosion resistant: fig. C-297, fig. C-298, fig. C-302 and fig. C-303

The fig. 297 and fig. 302 consist of a structural attachment, two studs, the sway brace, rod up to 2'-0" in length as required, and a modified fig. 295 pipe clamp.

The fig. 298 and fig. 303 consist of a structural attachment, two studs, the sway brace, steel pipe 2'-1" in length or over as required, an adapter and a modified fig. 295 pipe clamp.

**HOW TO SIZE ASSEMBLIES:** When using a sway brace as sized for pipe in the table below the "W" dimension, required for ordering, can be obtained as follows: Subtract from the overall dimension (wall to the center of the pipe) the "X" dimension given below. The resultant figure is the "W" dimension. "X" is not shown as a dimension on the line cuts.

In specifying sway brace assemblies where the "W" dimension exceeds 2'-0" in length, the fig. 298 assembly is recommended.

**ORDERING ASSEMBLIES:** Specify figure number, name, sway brace size, pipe size, "W" dimension. Available corrosion resistant as figs. C-297, C-298, C-302 and C-303.

fig. 297, recommended when W dimension is 2 ft 0 in. or less

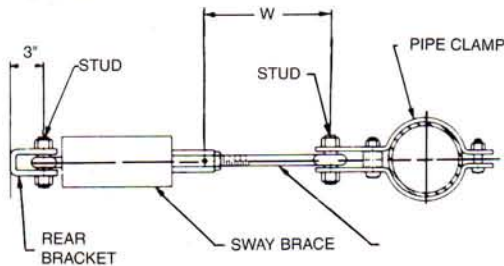


fig. 302, recommended when W dimension is 2 ft 0 in. or less

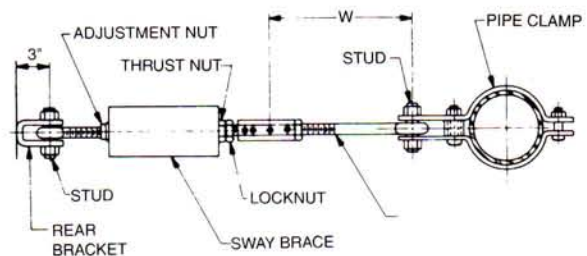


fig. 298, recommended when W dimension is greater than 2 ft

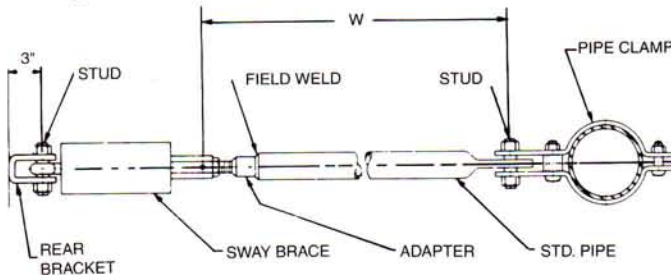
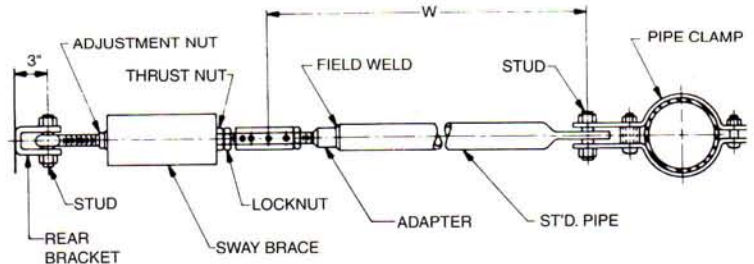


fig. 303, recommended when W dimension is greater than 2 ft



### dimensions (inches)

nominal pipe size	sway brace size	distance center of pipe to outside stud of pipe clamp	X •		W			
			figs. 297, 298	figs. 302, 303	fig. 297, 302		fig. 298, 303	
					MIN	MAX	MIN	MAX
2	1	5 <sup>1</sup> / <sub>8</sub>	21 <sup>3</sup> / <sub>4</sub>	28 <sup>1</sup> / <sub>8</sub>	7 <sup>15</sup> / <sub>16</sub>	24	25	90 <sup>3</sup> / <sub>16</sub>
2 <sup>1</sup> / <sub>2</sub>		5 <sup>3</sup> / <sub>8</sub>	21 <sup>3</sup> / <sub>4</sub>	28 <sup>3</sup> / <sub>8</sub>				
3		5 <sup>15</sup> / <sub>16</sub>	22 <sup>9</sup> / <sub>16</sub>	28 <sup>15</sup> / <sub>16</sub>				
3 <sup>1</sup> / <sub>2</sub>		6 <sup>3</sup> / <sub>16</sub>	22 <sup>13</sup> / <sub>16</sub>	29 <sup>3</sup> / <sub>16</sub>				
4	2	6 <sup>1</sup> / <sub>2</sub>	23 <sup>7</sup> / <sub>8</sub>	30 <sup>1</sup> / <sub>4</sub>	8 <sup>9</sup> / <sub>16</sub>	24	25	86 <sup>11</sup> / <sub>16</sub>
5		7	24 <sup>3</sup> / <sub>8</sub>	30 <sup>3</sup> / <sub>4</sub>				
6		8 <sup>9</sup> / <sub>16</sub>	25 <sup>15</sup> / <sub>16</sub>	32 <sup>5</sup> / <sub>16</sub>				
8		9 <sup>9</sup> / <sub>16</sub>	26 <sup>15</sup> / <sub>16</sub>	33 <sup>5</sup> / <sub>16</sub>				
10	3	10 <sup>5</sup> / <sub>8</sub>	31 <sup>1</sup> / <sub>4</sub>	37 <sup>3</sup> / <sub>4</sub>	8 <sup>9</sup> / <sub>16</sub>	24	25	79 <sup>3</sup> / <sub>16</sub>
12		11 <sup>5</sup> / <sub>8</sub>	32 <sup>1</sup> / <sub>4</sub>	38 <sup>3</sup> / <sub>4</sub>				
14		12 <sup>11</sup> / <sub>16</sub>	33 <sup>5</sup> / <sub>16</sub>	39 <sup>13</sup> / <sub>16</sub>				
16		13 <sup>11</sup> / <sub>16</sub>	34 <sup>5</sup> / <sub>16</sub>	40 <sup>13</sup> / <sub>16</sub>				
18	4	14 <sup>11</sup> / <sub>16</sub>	34 <sup>11</sup> / <sub>16</sub>	42	9 <sup>11</sup> / <sub>16</sub>	24	25	74 <sup>13</sup> / <sub>16</sub>
20		15 <sup>7</sup> / <sub>8</sub>	35 <sup>7</sup> / <sub>8</sub>	43 <sup>3</sup> / <sub>16</sub>				
24		17 <sup>7</sup> / <sub>8</sub>	37 <sup>7</sup> / <sub>8</sub>	45 <sup>3</sup> / <sub>16</sub>				

Dimensions for assemblies for larger pipe sizes available on application.

• See paragraph "How to size assemblies" above.

# Grinnell

## sway strut

sway strut assembly:

fig. 211

corrosion resistant: fig. C-211

fig. 640-field alterable strut



### E-TAKE OUT

	¾" rod end size	1" rod end size	1¼" & 1½" rod end size	1¾" & 2" rod end size	2¼" rod end size	2½" rod end size	3" rod end size	4" rod end size
pipe size	size A	size B&C	size 1&2	size 3&4	size 5	size 6	size 7	size 8
¾	2 <sup>7</sup> / <sub>16</sub>							
1	2 <sup>9</sup> / <sub>16</sub>							
1¼	2 <sup>11</sup> / <sub>16</sub>							
1½	4 <sup>1</sup> / <sub>8</sub>							
2	5 <sup>1</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>	6 <sup>3</sup> / <sub>8</sub>					
2½	5 <sup>3</sup> / <sub>8</sub>	7	7	*8 <sup>1</sup> / <sub>8</sub>				
3	5 <sup>15</sup> / <sub>16</sub>	7	7	*8 <sup>1</sup> / <sub>8</sub>				
3½	6 <sup>3</sup> / <sub>16</sub>	7	7	*8 <sup>1</sup> / <sub>8</sub>	10			
4	6½	7¼	7¼	*8 <sup>3</sup> / <sub>8</sub>	10			
5	7¾	7¾	7¾	9 <sup>1</sup> / <sub>8</sub>	10			
6	8¾	8¾	8¾	10	10	11 <sup>7</sup> / <sub>8</sub>		
8	9¾	9¾	9¾	11¼	11¼	12 <sup>5</sup> / <sub>8</sub>		
10	10½	10½	10½	12¾	12¾	14¼	14¼	16¼
12		11 <sup>7</sup> / <sub>8</sub>	11 <sup>7</sup> / <sub>8</sub>	13 <sup>7</sup> / <sub>8</sub>	13 <sup>7</sup> / <sub>8</sub>	15 <sup>3</sup> / <sub>8</sub>	15 <sup>3</sup> / <sub>8</sub>	17¼
14		12 <sup>5</sup> / <sub>8</sub>	12 <sup>5</sup> / <sub>8</sub>	14½	14½	16	16¼	18
16		13 <sup>5</sup> / <sub>8</sub>	13 <sup>5</sup> / <sub>8</sub>	15¼	15¼	17 <sup>1</sup> / <sub>8</sub>	17½	19
18		14 <sup>5</sup> / <sub>8</sub>	14 <sup>5</sup> / <sub>8</sub>	16 <sup>3</sup> / <sub>8</sub>	16 <sup>3</sup> / <sub>8</sub>	18¼	18½	20¼
20		15¾	15¾	17¾	17¾	19¼	19¾	21½
24		18 <sup>1</sup> / <sub>8</sub>	18 <sup>1</sup> / <sub>8</sub>	19 <sup>7</sup> / <sub>8</sub>	19 <sup>7</sup> / <sub>8</sub>	21¾	21¾	24
30		21¼	21¼	23	23	25	25	28
36		24	24	26½	26½	28 <sup>1</sup> / <sub>8</sub>	28 <sup>1</sup> / <sub>8</sub>	31¼

\*For size 3 only

\*Clamp dimensions are based on max. temp. of 650°F (carbon steel).  
Alternate materials are available on request.

**FINISH:** Painted or galvanized.

**SERVICE:** Used to restrain movement of piping in one direction while providing for movement due to thermal expansion or contraction in another direction.

#### HOW TO SIZE:

1. Select size consistent with max. load to be restrained.
2. Determine distance from structural steel to center of pipe and subtract from it, pipe clamp take out (dim. E) for pipe size being restrained and rear bracket (dim. A) for size selected. This will give required C to C dimension. Check to be within limits of min. and max. C-C dimension listed for size selected.
3. Determine W dimension by subtracting (2 times dimension F) from C-C dimension.

**INSTALLATION:** Shipped assembled. Securely fasten bracket to structure, make necessary adjustment in overall length, and fasten clamp to pipe.

#### FEATURES:

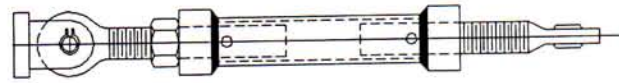
- Effective under either tensile or compressive force.
- Provides 3½ inches (fig. 211) 2 inches (fig. 640) of field adjustment in either direction.
- Self-aligning bushings permit ± 5° misalignment or angular motion. Bushings are coated with a dry lubricant.

**ORDERING:** Specify figure number, assembly size, name, option number, normal pipe size or special O.D., and "W" dimension. Alloy pipe clamps are available as a special order. The rear bracket assembly may be ordered separately.

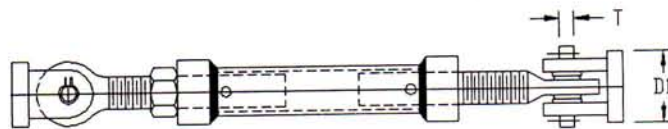
For restraint parallel to the pipe axis using two sway strut assemblies, a riser clamp is available. If a riser clamp is required, consult the nearest Grinnell representative for information about this clamp.



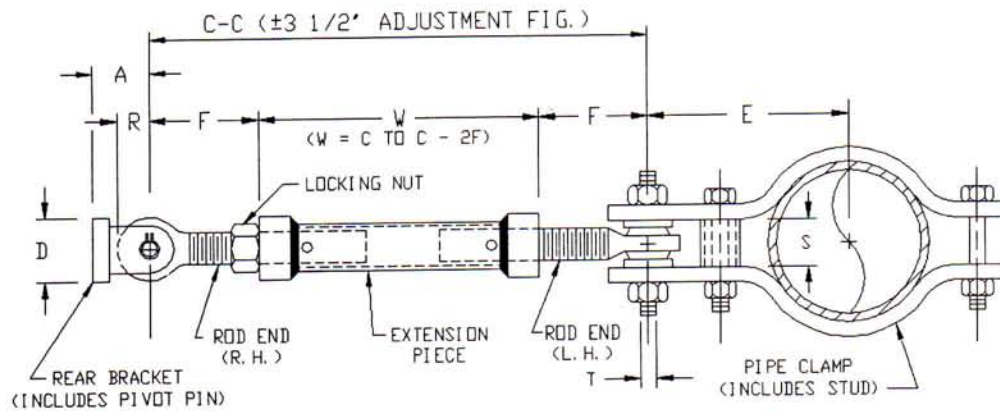
**sway strut assembly:  
fig. 211**



OPTION 1



OPTION 2



OPTION 3

**load (lbs) • dimensions (inches)**

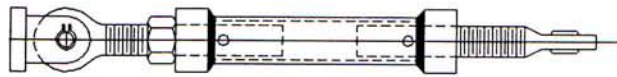
Size	Load	Rod End	Ext. Piece	A	Fig. 211 C - C		Fig. 211 W		F	D	D <sub>1</sub>	N	R	S	T
					Max.	Min.	Max.	Min.							
A	650	3/4	1	1	60	15 1/2	53 3/8	9 5/8	3 7/16	2 7/8	1 1/4	1/4	5/8	5/8	.374 .372
B	1500	1	1 1/2	2 3/8	108	19	99 1/8	10 1/8	4 7/16	5	3 3/8	1/2	1 3/8	1 3/8	.749 .747
C	4500	1	2	2 3/8	120	19	111 1/8	10 1/8	4 7/16	5	3 3/8	1/2	1 3/8	1 3/8	.749 .747
1	8000	1 1/4	2	2 1/2	120	21	110 3/8	11 3/8	4 13/16	4 1/2	3	3/4	1 1/2	1 3/8	.999 .997
2	11630	1 1/2	2 1/2	2 1/2	120	21 3/8	110	11 3/8	5	4 1/2	3	3/4	1 1/2	1 3/8	.999 .997
3	15700	1 3/4	2 1/2	3 1/4	120	22 7/8	108 1/2	11 3/8	5 3/4	5 3/8	3 9/16	1	2	1 11/16	1.249 1.247
4	20700	2	3	3 3/4	120	26	108	14	6	5 3/8	3 9/16	1	2	1 11/16	1.249 1.247
5	27200	2 1/4	3	4	120	27 1/2	106 1/2	14	6 3/4	6 1/8	4 1/4	1 1/4	2 1/2	2	1.499 1.497
6	33500	2 1/2	4	5	120	29 1/4	104 3/4	14	7 5/8	7 7/8	5 3/8	1 3/4	3	2 3/8	1.749 1.747
7	68200	3	4	5 3/4	120	37 1/2	102 1/2	15	8 3/4	9 1/8	6 1/4	2	3 1/2	3	1.999 1.997
8	120000	4	6	7 1/4	120	39 1/4	98	17 1/4	11	14	8 3/4	2 1/4	4 3/4	3 3/8	2.499 2.497

■ Loads must not be applied outside a 10° included angle cone of action to the pipe clamp axis without special authorization.  
Note: The rear bracket assembly can be ordered separately.

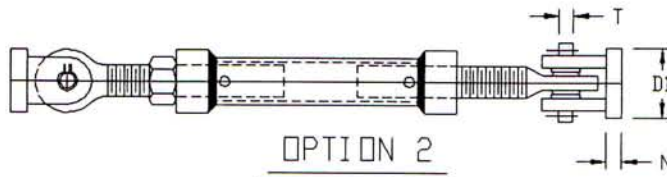
# Grinnell

## sway strut

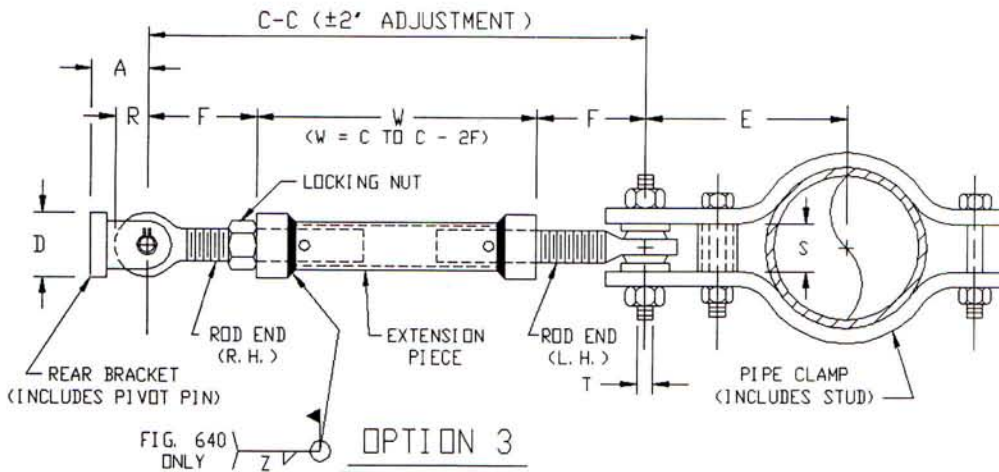
### sway strut assembly fig. 640



OPTION 1



OPTION 2



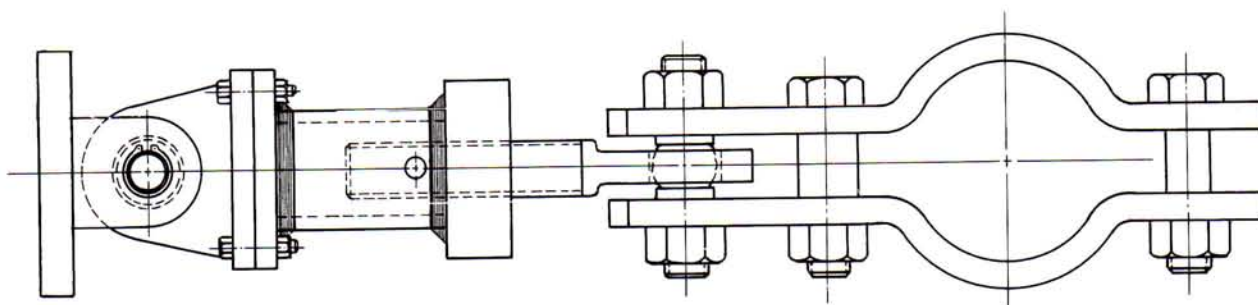
\*Shipped at max length C-C  
Field to cut "W" to suit

### load (lbs) • dimensions (inches)

size	Z weld	rod end	ext. piece pipe size	A	c-c		F	D	D'	N	R	S	T
					min	max							
A	3/16	3/4	1	1	12 1/8	60	2 11/16	2 7/8	1 1/4	1/4	5/8	5/8	.374 .372
B	3/16	1	1 1/2	2 1/8	14 7/16	96	3 11/16	5	3 3/8	1/2	1 3/8	1 3/8	.749 .747
C	3/16	1	2	2 1/8	14 7/16	96	3 11/16	5	3 3/8	1/2	1 3/8	1 3/8	.749 .747
1	5/16	1 1/4	2	2 1/2	16 1/2	96	4 1/8	4 1/2	3	3/4	1 1/2	1 3/8	.999 .997
2	5/16	1 1/2	2 1/2	2 1/2	16 7/8	96	4 1/4	4 1/2	3	3/4	1 1/2	1 3/8	.999 .997
3	5/16	1 3/4	2 1/2	3 1/4	18 3/8	96	5	5 3/8	3 9/16	1	2	1 11/16	1.249 1.247
4	3/8	2	3	3 1/4	20 1/2	96	5 1/4	5 3/8	3 9/16	1	2	1 11/16	1.249 1.247
5	3/8	2 1/4	3	4	22	96	6	6 1/8	4 1/4	1 1/4	2 1/2	2	1.499 1.497
6	3/8	2 1/2	4	5	23 3/4	96	6 7/8	7 7/8	5 3/8	1 3/4	3	2 3/8	1.749 1.747
7	5/8	3	4	5 3/4	28	96	8	9 1/8	6 1/4	2	3 1/2	3	1.999 1.997
8	3/4	4	6	7 1/4	34 3/4	96	10 1/4	14	8 3/4	2 1/4	4 3/4	3 3/8	2.499 2.497

\*Loads are the same as fig. 211 page ph-144.

mini-sway strut assembly:  
fig. 222 loads & dimensions on next page



**SERVICE:** Used to restrain movement of piping in one direction while providing for movement due to thermal expansion or contraction in another direction.

**HOW TO SIZE:**

1. Select size consistent with max. load to be restrained.
2. Determine distance from structural steel to center of pipe and subtract from it, pipe clamp take out (dim. E) for pipe size being restrained and rear bracket (dim. A) for size selected. This will give required C to C dimension. Check to be within limits of min. and max. C-C dimension listed for size selected.

**E-TAKE OUT**

	¾" rod end size	1" rod end size	1¼" & 1½" rod end size
pipe size	size A	size B&C	size 1
¾	27/16		
1	29/16		
1¼	211/16		
1½	47/8		
2	57/8	63/8	63/8
2½	53/8	7	7
3	515/16	7	7
3½	63/16	7	7
4	6½	7¼	7¼
5	7¾	7¾	7¾
6	83/8	83/8	83/8
8	93/8	93/8	93/8
10	10½	10½	10½
12		117/8	117/8
14		125/8	125/8
16		133/8	133/8
18		143/8	143/8
20		15¾	15¾
24		187/8	187/8
30		21¼	21¼
36		24	24

**INSTALLATION:** Shipped assembled. Securely fasten bracket to structure, make necessary adjustment in over-all length, and fasten clamp to pipe.

**FEATURES:**

- Assembly provides a shorter C to C dimension.
- Effective under either tensile or compressive force.
- Self-aligning bushings permit ± 5° misalignment or angular motion. Bushings are coated with a dry lubricant.

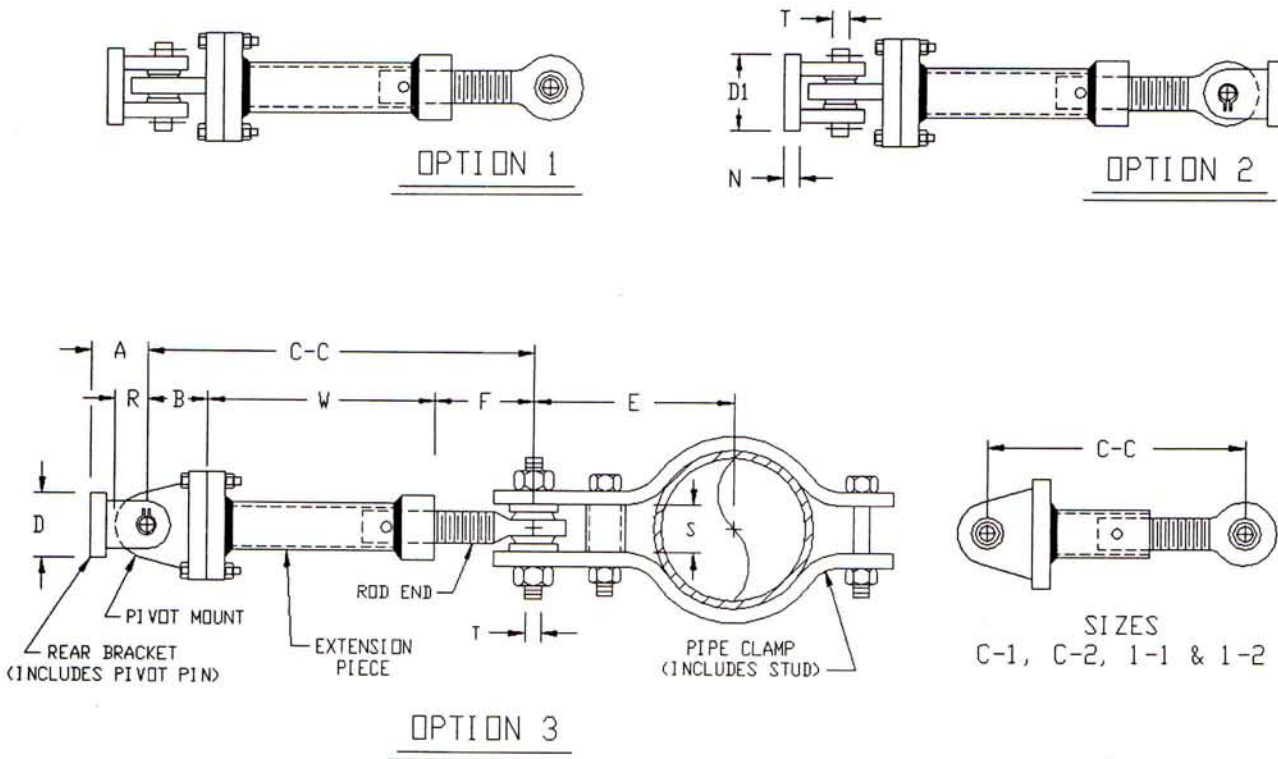
**ORDERING:** Specify assembly size, fig. no., name, pipe O.D. or option no, if other than standard, and load. Ex: Size A-1, Fig. 222 Mini Sway Strut 10¾ O.D. pipe, 650#. Alloy pipe clamps are available as a special order.

For restraint parallel to the pipe axis using two sway strut assemblies, a riser clamp is available. If a riser clamp is required, consult the nearest Grinnell representative for information about this clamp.

# Grinnell

## sway strut

fig. 222



**load (lbs) • dimensions (inches)**

assembly size no.	Load	c-c		F		W	
		max	min	max	min		
A	A-1	650	6 <sup>5</sup> / <sub>8</sub>	5 <sup>3</sup> / <sub>8</sub>	2 <sup>13</sup> / <sub>16</sub>	1 <sup>9</sup> / <sub>16</sub>	2 <sup>5</sup> / <sub>8</sub>
	A-2		8 <sup>1</sup> / <sub>2</sub>	6 <sup>1</sup> / <sub>2</sub>	4 <sup>1</sup> / <sub>4</sub>	2 <sup>1</sup> / <sub>4</sub>	3 <sup>1</sup> / <sub>16</sub>
	A-3		13 <sup>1</sup> / <sub>4</sub>	8 <sup>1</sup> / <sub>2</sub>	6 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>2</sub>	5 <sup>13</sup> / <sub>16</sub>
B & C	BC-1	4500	6 <sup>1</sup> / <sub>2</sub>	6	2 <sup>7</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>2</sub>
	BC-2		7 <sup>3</sup> / <sub>4</sub>	6 <sup>5</sup> / <sub>8</sub>	3 <sup>1</sup> / <sub>2</sub>	2 <sup>3</sup> / <sub>8</sub>	2 <sup>1</sup> / <sub>8</sub>
	BC-3		8 <sup>1<sup>1</sup>/<sub>16</sub></sup>	7 <sup>9</sup> / <sub>16</sub>	3 <sup>13</sup> / <sub>16</sub>	2 <sup>11</sup> / <sub>16</sub>	2 <sup>3</sup> / <sub>4</sub>
	BC-4		10 <sup>15</sup> / <sub>16</sub>	8 <sup>11</sup> / <sub>16</sub>	4 <sup>15</sup> / <sub>16</sub>	2 <sup>11</sup> / <sub>16</sub>	3 <sup>7</sup> / <sub>8</sub>
	BC-5		15 <sup>7</sup> / <sub>16</sub>	10 <sup>15</sup> / <sub>16</sub>	7 <sup>9</sup> / <sub>16</sub>	2 <sup>11</sup> / <sub>16</sub>	6 <sup>1</sup> / <sub>8</sub>
	BC-6		19 <sup>9</sup> / <sub>16</sub>	15 <sup>7</sup> / <sub>16</sub>	9 <sup>1</sup> / <sub>4</sub>	5 <sup>1</sup> / <sub>8</sub>	8 <sup>3</sup> / <sub>16</sub>
1	1-1	8000	8 <sup>7</sup> / <sub>8</sub>	8	3 <sup>11</sup> / <sub>16</sub>	2 <sup>13</sup> / <sub>16</sub>	2 <sup>1</sup> / <sub>8</sub>
	1-2		10 <sup>5</sup> / <sub>8</sub>	8 <sup>7</sup> / <sub>8</sub>	4 <sup>9</sup> / <sub>16</sub>	2 <sup>13</sup> / <sub>16</sub>	3
	1-3		11 <sup>7</sup> / <sub>8</sub>	10 <sup>1</sup> / <sub>4</sub>	4 <sup>13</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>16</sub>	4
	1-4		15 <sup>1</sup> / <sub>8</sub>	11 <sup>7</sup> / <sub>8</sub>	6 <sup>7</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>16</sub>	5 <sup>5</sup> / <sub>8</sub>
	1-5		21 <sup>5</sup> / <sub>8</sub>	15 <sup>1</sup> / <sub>8</sub>	9 <sup>1</sup> / <sub>16</sub>	3 <sup>3</sup> / <sub>16</sub>	8 <sup>7</sup> / <sub>8</sub>

size	rod end	A	D	D'	N	R	S	T Nom.	B
A	3/4	1	2 <sup>7</sup> / <sub>8</sub>	1 <sup>1</sup> / <sub>4</sub>	1/4	5/8	5/8	3/8	1 <sup>13</sup> / <sub>16</sub>
BC	1	2 <sup>1</sup> / <sub>8</sub>	5	3 <sup>5</sup> / <sub>8</sub>	1/2	1 <sup>3</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>8</sub>	3/4	2 <sup>1</sup> / <sub>8</sub>
1	1 <sup>1</sup> / <sub>4</sub>	2 <sup>1</sup> / <sub>2</sub>	4 <sup>1</sup> / <sub>2</sub>	3	3/4	1 <sup>9</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>8</sub>	1	3 <sup>1</sup> / <sub>16</sub>

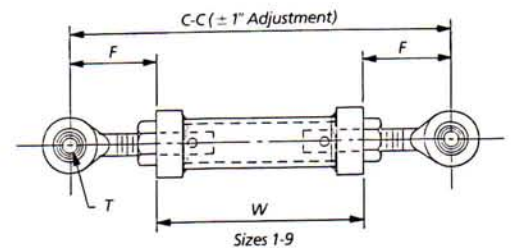
■ Loads must not be applied outside a 10° included angle cone of action to the pipe clamp axis without special authorization.

NOTE: The rear bracket assembly may be ordered separately.



Fig. 210 rigid replacement struts provide a viable, low-cost solution that complements snubber reduction programs in nuclear and non-nuclear power plants. They are being used to replace both mechanical and hydraulic snubbers on a one-to-one size basis in most installations. Replaced snubbers may then be placed back on the shelf and used for maintenance and repair, reducing or eliminating the stocking of new snubbers.

**ORDERING:** Specify size, figure number, name and W dimension.



#### dimensions

size	F	C-C		W		T nom.	replaces	
		min.	max.	min.	max.		fig. 200/201	fig. 306/307
1	2 <sup>3</sup> / <sub>16</sub>	9	66	4 <sup>5</sup> / <sub>8</sub>	61 <sup>5</sup> / <sub>8</sub>	<sup>3</sup> / <sub>8</sub>		¼ K & ½ K
2	3 <sup>1</sup> / <sub>16</sub>	12 <sup>9</sup> / <sub>16</sub>	77	6 <sup>7</sup> / <sub>16</sub>	70 <sup>7</sup> / <sub>8</sub>	½		1 K
3	3 <sup>3</sup> / <sub>8</sub>	14 <sup>13</sup> / <sub>16</sub>	100	8 <sup>1</sup> / <sub>16</sub>	93 <sup>1</sup> / <sub>4</sub>	<sup>3</sup> / <sub>4</sub>	1½	3 K
4	4	15 <sup>5</sup> / <sub>8</sub>	120	7 <sup>5</sup> / <sub>8</sub>	112	1	2½	10 K
5	4¾	17 <sup>7</sup> / <sub>8</sub>	120	8 <sup>3</sup> / <sub>8</sub>	110½	1¼	¾	
6	5¾	19 <sup>7</sup> / <sub>8</sub>	120	8 <sup>3</sup> / <sub>8</sub>	108½	1½	4	
7	6½	22½	120	9½	107	1¾	5	
8	6¾	27	130	14¼	117¼	1½		35 K
9	7 <sup>5</sup> / <sub>8</sub>	25¼	120	10	104¾	2	6	

**NOTE:** The Figure 210 has the same load rating as the snubber it replaces.

fig. 200 hydraulic shock and sway suppressor  
 fig. 201 hydraulic shock and sway suppressor with extension piece  
 corrosion resistant: fig. C-200  
 corrosion resistant: fig. C-201  
 patented

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

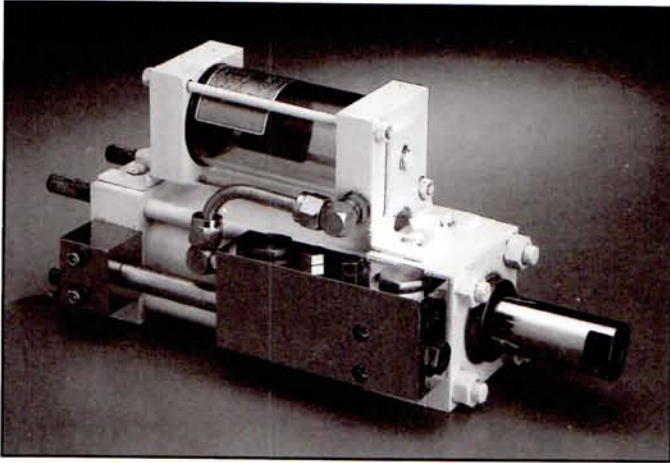
**SIZE RANGE:** Seven standard sizes with cylinder bores of 1½ to 8 inches and with normal load ratings from 3,000 pounds to 128,000 pounds. All are available with 5, 10, 15 or 20 inch strokes except the 1½ inch size which is offered with 5 to 10 inch strokes only. Snubbers are available with integral or remote reservoirs.

**Maximum recommended loads**

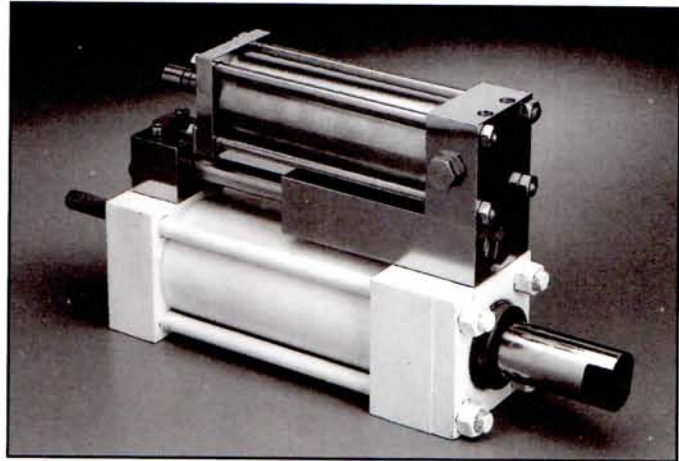
Cylinder Size (inch)	Maximum Recommended normal load, lb. <sup>a</sup>
1½ (5" STROKE)	3000
1½ (10" STROKE)	1250
2½ (5", 10", 15" STROKE)	12500
2½ (20" STROKE)	10500
3¼	21000
4	32000
5	50000
6	72000
8	128000

<sup>a</sup>Loads must not be applied outside a 10° included angle cone of action to the pipe clamp axis without special authorization.

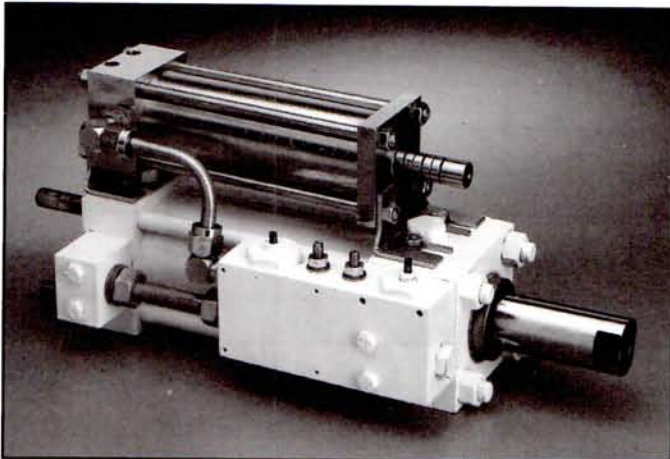
**STANDARD FINISH:** Standard finish painted with semi gloss primer. Corrosion resistant; painted with carbo zinc.



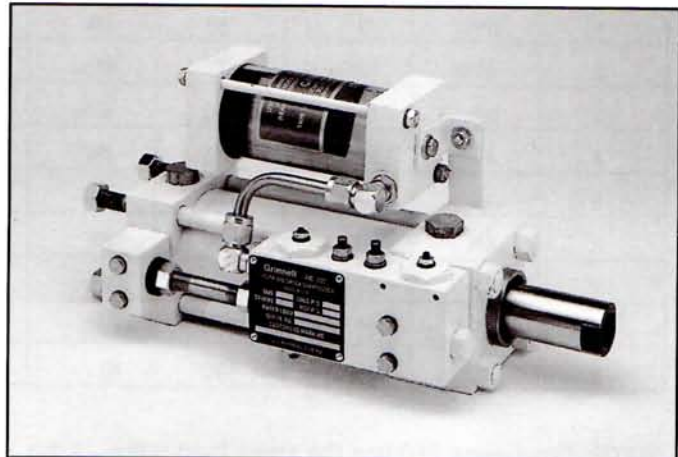
*Temperature compensating valve with transparent reservoir*



*Temperature compensating valve with pressurized reservoir*



*Adjustable valve with pressurized reservoir*



*Adjustable valve with transparent reservoir*

# hydraulic shock and sway suppressor

## STANDARD SETTINGS: The standard settings are:

Locking (Activation) Velocity  $8 \pm 2$  in/min.  
 Bleed Rate (Post Activation)  
 at Normal Rated Load  $4 \pm 1$  in/min. (Special settings are available).

The valves are calibrated at the factory within the tolerances indicated at room temperature. Locking velocity and bleed rate will vary with temperature. Testing has indicated that there is little effect of these changes on dynamic operation.

## FEATURES

- Choice of valve type
  - Adjustable - permits field adjustments
  - Temperature compensating - minimizes the effects of temperature on lockup and bleed
- Choice of reservoir type
  - Transparent - continuous operation at 200°F with brief transients to 250°F
  - Metal or pressurized - allows brief transients to 340°F
  - Pressurized - eliminates the concern of reservoir orientation relative to valve and cylinder - minimizes internal contamination
  - Remote
- Factory Calibrated Valves
- Rapid, Positive Valve Closure
- Special Design Minimizes the "lost motion" which results from the shifting and seating of piston seals
- Unlocked resisting force is less than 1% of rated load
- Stable, non-flammable, long life hydraulic fluid made highly visible for ease of inspection
- Self-aligning bushings permit  $\pm 5^\circ$  misalignment or angular motion. Bushings are coated with a dry lubricant.
- Choice of coating (paint, primer, carbo zinc, epoxy, plating or other)

**UPGRADE KITS:** Kits are available to upgrade existing snubbers with temperature compensating valves and/or pressurized reservoir.

## HOW TO SIZE:

### 1. Cylinder Size:

Use table on page ph-151 to select cylinder bore size large enough to restrain expected load.

### 2. Stroke:

Define expected movement of the pivot joining the suppressor with the equipment to be protected (cold to hot plus any abnormal movements). Determine maximum and minimum distances between this curve and the fixed pivot pin of the suppressor. The minimum recommended stroke is 20% greater than the difference between these lengths. NOTE: If erected position at the suppressor's location on the equipment is outside of the range of normal cold-to-hot movement (e.g. cold pull of pipe), the suppressor should not be installed until after the equipment is in its cold position. This eliminates the need of providing for the extra travel in the suppressor's stroke.

For 2½ inch through 8 inch suppressors, standard strokes are 5, 10, 15, and 20 inches. For the 1½ inch suppressor, 5 and 10 inches are the only standard strokes.

### Installed Piston Setting:

As indicated previously, the suppressor should be installed at its cold piston position if possible. From the installed position, take extension (outward movement) of the piston rod as positive (+) and retraction as negative (-).

$$\text{Installed Piston Position} = \frac{\text{Stroke} - (\text{Algebraic Sum of Movements})}{2}$$

To aid in measuring the piston position, we have shown a dimension, "Z". This dimension represents the distance between the cylinder head and the end of the rod when the rod is fully retracted. Whenever specifying the position at which the piston rod is to be set, the total dimension from the cylinder head to the end of the rod should be given. Thus, Piston Setting = Piston Position + Z.

### Assembly Length:

Determine the installed "C" dimension by adding the installed piston position (not setting) to C minimum. Lay in takeout dimensions E and/or B, and find required pin-to-pin suppressor length.

If a pin-to-pin length adjustment is desired, use Fig. 201. Calculate the required "W" dimension by subtracting (C installed + F) from the required pin-to-pin length. If this is less than W minimum, only a Fig. 200 can be used, and one of the attachments will have to be moved or shimmed to suit. If a Fig. 200 is to be used, make sure that the required pin-to-pin length is at least as great as (C installed + B). If neither a Fig. 200 nor a Fig. 201 can be accommodated, and the installation cannot be modified, consult your Grinnell representative about designing a special or modified unit.

## ORDERING: SPECIFY PART NUMBER AS FOLLOWS

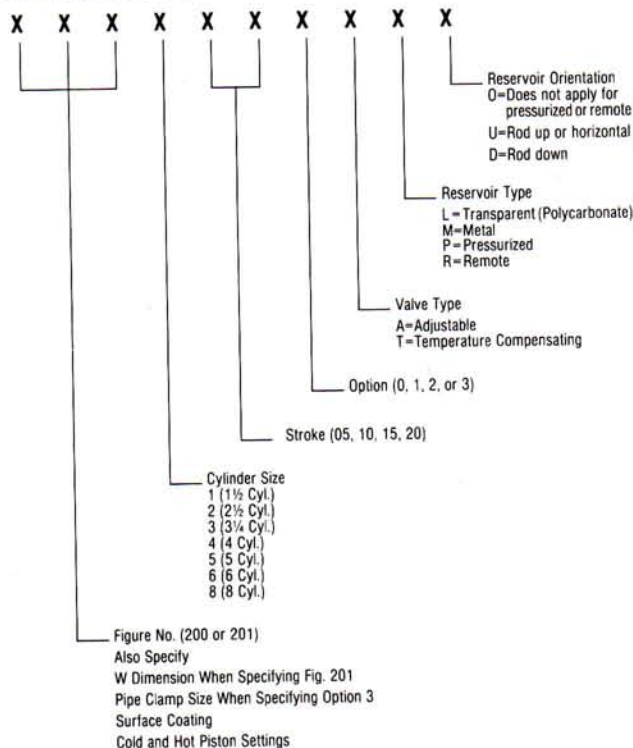


Fig. 200 Option 0 consists of the basic unit (suppressor) with pivot mount and one rear bracket.

Fig. 201 Option 0 consists of the basic unit with extension piece and one rear bracket.

Fig. 200 & Fig. 201 Option 1 includes cylinder eye and 1 rear bracket.

Fig. 200 & Fig. 201 Option 2 includes cylinder eye and additional rear bracket.

Fig. 200 & Fig. 201 Option 3 includes cylinder eye, 1 rear bracket and pipe clamp.

## hydraulic shock and sway suppressor

weights • dimensions (inches)

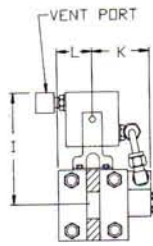
cylinder		wgt. ea. fig. 200 lb.	A	B	C			D	D <sub>1</sub>	F	G	H	I metal res.	I trans- parent res.	I press res.
bore	stroke				min.	mid.	max.								
1½	5	45	2	1½	13⅞	15⅝	18⅞	¾	2	6	¾	⅝-18	5⁹⁄₁₆	4¹³⁄₁₆	4¾
	10	49			18⅞	23⅞	28⅞								
2½	5	75	2½	2¼	13⅜	15⅞	18⅜	4½	3	7³⁄₁₆	⅞	⅞-14	6¼	5⅞	5¾
	10	81			18⅜	23⅜	28⅜								N/A
	15	87			23⅜	30⅞	38⅜								
	20	93			28⅜	38⅜	48⅜								
¾	5	121	¾	3	14⅞	17⅞	19⅞	5⅝	3⁹⁄₁₆	7¹⁵⁄₁₆	1⅞	1⅞-12	6⅞	5¾	6¾
	10	132			19⅞	24⅞	29⅞								N/A
	15	146			24⅞	32⅞	39⅞								
	20	156			29⅞	39⅞	49⅞								
4	5	177	4	3¾	16⅞	18⅞	21⅞	6⅞	4¼	9⁵⁄₁₆	1½	1½-12	7⅞	6	7¹³⁄₁₆
	10	189			21⅞	26⅞	31⅞								N/A
	15	206			26⅞	33⅞	41⅞								
	20	223			31⅞	41⅞	51⅞								
5	5	235	5	4½	18	20½	23	7⅞	5⅝	10⁹⁄₁₆	1⅞	1⅞-12	8½	7	9⁵⁄₁₆
	10	256			23	28	33								N/A
	15	277			28	35½	43								
	20	298			33	43	53								
6	5	292	5¾	5½	19¾	22¼	24¾	9⅞	6¼	11⁵⁄₁₆	2¼	2¼-12	9¹⁄₁₆	7⅞	10¹⁵⁄₁₆
	10	320			24¾	29¾	34¾								N/A
	15	348			29¾	37¼	44¾								
	20	375			34¾	44¾	54¾								
8	5	515	7¼	6	23½	26	28½	14	8¾	14½	4	3 -12	12½	NOT AVAILABLE	
	10	575			28½	33½	38½								
	15	640			33½	41	48½								
	20	705			38½	48½	58½								

### dimensions (inches)

cylinder		K	L	N	Q	R	S	T	W		Z
bore	stroke								min.	max.	
1½	5	2¾	2¼	½	2⅞	1⅞	1	¾	9½	75⅝	⅝
	10									65⅝	
2½	5	¾	1¾	¾	2	1⅞	1⅞	1	10⅞	94⁹⁄₁₆	1
	10									84⁹⁄₁₆	
	15									74⁹⁄₁₆	
	20									64⁹⁄₁₆	
¾	5	¾	2¼	1	2½	2¹⁄₁₆	1¹¹⁄₁₆	1¼	10½	92	1⅞
	10									82	
	15									72	
	20									62	
4	5	4	2½	1¼	3⅞	2½	2	1½	11½	89⁹⁄₁₆	1⅞
	10									79⁹⁄₁₆	
	15									69⁹⁄₁₆	
	20									59⁹⁄₁₆	
5	5	4¾	3¼	1¾	4	3¹⁄₁₆	2⅞	1¾	12	86¹³⁄₁₆	1⅞
	10									76¹³⁄₁₆	
	15									66¹³⁄₁₆	
	20									56¹³⁄₁₆	
6	5	5¼	3⅞	2	4⅞	3½	2¾	2	13⅞	83¹⁵⁄₁₆	1¾
	10									73¹⁵⁄₁₆	
	15									63¹⁵⁄₁₆	
	20									53¹⁵⁄₁₆	
8	5	4⅞	4⅞	2¼	6¾	4¾	—	2½	14½	75½	2¼
	10									65½	
	15									55½	
	20									45½	



hydraulic shock and sway suppressor



SECTION X-X

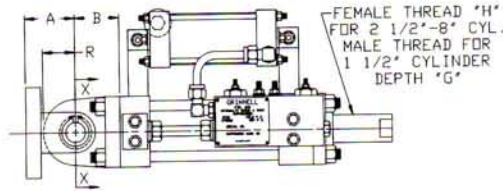


FIG. 200  
OPTION 0

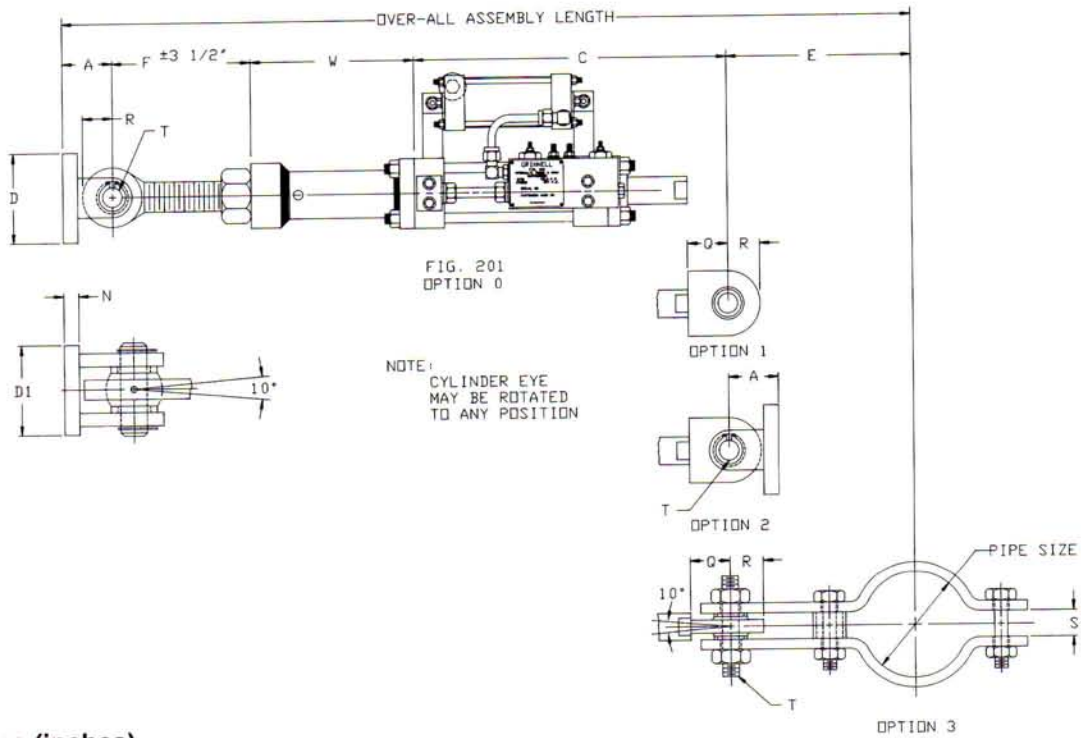
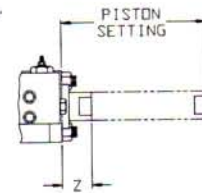


FIG. 201  
OPTION 0

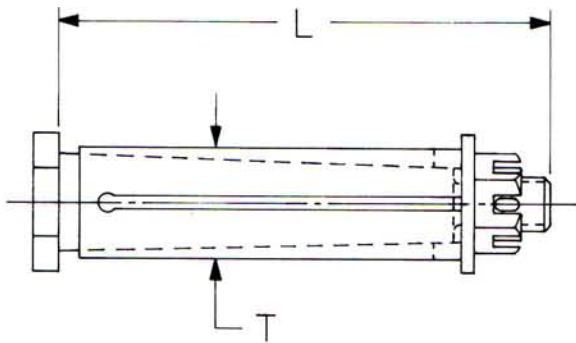
dimensions (inches)

Pipe Size	E-Take-Out						Clamp stock Size					
	Cylinder Bore						Cylinder Bore					
	1½	2½	3¼	4	5	6	1½	2½	3¼	4	5	6
2	6	6¾					¾ x 1¾	½ x 2½				
2½	7	7					¾ x 1¾	½ x 2½				
3	7	7					¾ x 1¾	½ x 2½				
3½	7	7					¾ x 1¾	½ x 2½				
4	7¼	7¼					½ x 1½	¾ x 2½				
5	7¾	7¾	9½	10			½ x 1½	¾ x 2½	¾ x 3	¾ x 5		
6	8¾	8¾	10	10	11½		½ x 2	¾ x 3	¾ x 4	¾ x 5	1 x 5	
8	9¾	9¾	11¼	11¼	12¾		½ x 2½	¾ x 3	¾ x 5	1 x 5	1 x 6	
10	10½	10½	12¾	12¾	14¼		¾ x 2½	¾ x 4	¾ x 6	1 x 5	1 x 7	
12	11¾	11¾	13¾	13¾	15¾		¾ x 2½	¾ x 5	1 x 5	1 x 6	1 x 7	
14	12¾	12¾	14½	14½	16		¾ x 2½	¾ x 5	1 x 5	1 x 7	1¼ x 6	
16	13¾	13¾	15¼	15¼	17½		¾ x 3	¾ x 6	1 x 5	1 x 7	1¼ x 6	
18	14¾	14¾	16¾	16¾	18¼		¾ x 3	1 x 5	1 x 6	1 x 7	1¼ x 7	
20	15¾	15¾	17¾	17¾	19¼	19¼	¾ x 3	1 x 5	1 x 7	1¼ x 6	1¼ x 8	1½ x 8
24	18½	18½	19¾	19¾	21¾	21¾	¾ x 4	1 x 5	1 x 7	1¼ x 6	1¼ x 9	1½ x 9
30	21¼	21¼	23	23	25	25	¾ x 4	1 x 6	1¼ x 6	1¼ x 8	1½ x 8	1¾ x 10
36	24	24	26½	26½	28½	28½	¾ x 5	1 x 7	1¼ x 6	1¼ x 9	1½ x 10	1¾ x 10

# Grinnell

## tapered load pin/stud

### tapered load pin fig. 312



**SIZE RANGE:** 3/8 thru 2 1/2 Nominal Pin Dia.

**SERVICE:** Used as replacement to standard rear bracket load pin to facilitate easy removal at time of rebuild or testing. May be supplied with new orders, when specified.

**HOW TO SIZE:** Select size consistent with load pin diameter for size Fig. 200/201 or Fig. 306/307 to be used with.

**INSTALLATION:** Shipped assembled. Remove cotter pin, slotted hex nut and washer. Loosen sleeve on pin and install sleeve/pin. Re-install washer and slotted hex nut. Tighten hex nut to snug. Install cotter pin.

**FEATURES:**

- Ease of removal at time of scheduled rebuild or testing.
- Minimizes "Free Play" between pin to pin.

**ORDERING:** Specify figure number, nominal pin size and name.

### dimensions

NOMINAL DIAMETER T	MAX RECOM LOAD (lbs)	FIG. 312 L	COMPATIBLE WITH FIG.	
			200/201	306/307
3/8	650	1 3/4		1/4 & 1/2
1/2	1,500	2 3/8		1
3/4	6,000	3 7/8	1 1/2	3
1	15,000	4 3/8	2 1/2	10
1 1/4	20,700	4 3/4	3 1/4	
1 1/2	50,000	7 1/4	4	35
1 3/4	45,500	7	5	
2	68,200	8 1/4	6	
2 1/2	120,000	9 3/8	8	100

The load must be applied by a spherical bearing.

fig. 1306 limit stop  
 fig. 1307 limit stop with extension piece

**SIZE RANGE:** Rated loads from 650 lbs. to 670,000 lbs. Many stroke available.

**SERVICE:** Limit Stops are passive restraints with preset gaps. The gaps are sized to permit free thermal movement but prevent excessive pipe stresses by limiting displacements due to seismic or other disturbing events.

**HOW TO SIZE:** Select size based on expected load. Stroke is determined by the required gap.

**FEATURES:**

- Totally passive
- Unrestricted thermal movement
- Simple installation
- Simplified inspection - visual
- ISO-9001 qualified
- Pin-to-Pin: Up to 120 inches

**MATERIALS:** Smaller sizes (up to 10,000 lb. load) are of stainless steel construction and utilize internal body threads for adjusting gaps. For larger sizes, Carbon Steel is used, and the gaps are adjusted with internal spacer washers. Hard chrome, as well as other platings and coatings, are utilized to meet any environment.



rated load (lb.)	size	stroke * (in.)	pin dia. (in.)	pin to pin (fig. 1306)* (in.)	
				min.	max.
650	1	4	3/8	10.10	14.10
1,500	2	4	1/2	12.51	16.51
3,000	11	5	3/4	14.75	19.75
6,000	3	5	3/4	16.50	21.50
12,500	12	5	1	15.63	20.63
15,000	4	6	1	20.16	26.16
21,000	13	5	1 1/4	17.88	22.88
32,000	14	5	1 1/2	19.88	24.88
50,000	5	6	1 1/2	27.00	33.00
50,000	15	5	1 3/4	22.50	27.50
72,000	16	5	2	25.25	30.25
120,000	6	6	2 1/2	32.80	38.80
128,000	18	5	2 1/2	29.50	34.50
200,000	19	AS REQUIRED			
268,000	20	AS REQUIRED			
670,000	21	AS REQUIRED			

\*Standard - other strokes available

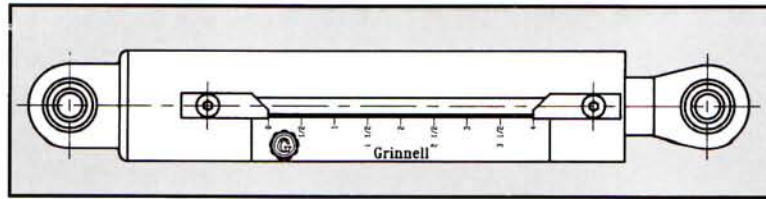


FIGURE 1306 (Smaller Sizes)

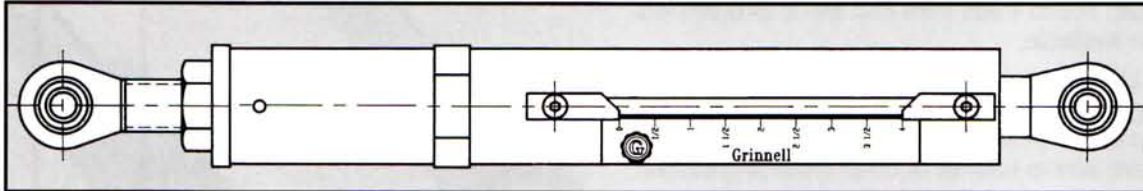


FIGURE 1307 (Smaller Sizes)

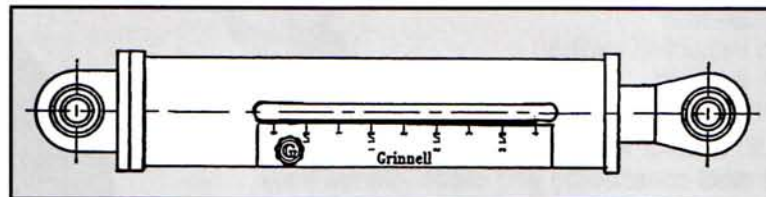


FIGURE 1306 (Larger Sizes)

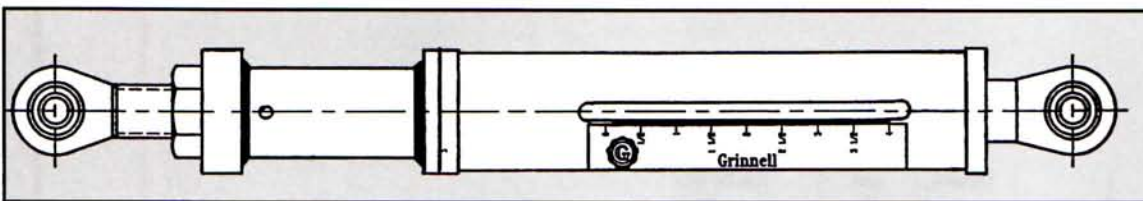


FIGURE 1307 (Larger Sizes)

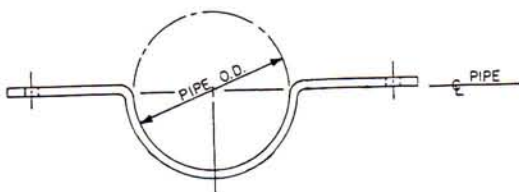
FIG. 1306 SPECIFY: SIZE, STROKE, FIG. NO. 1306 LIMIT STOP,  
COMPRESSION SETTING AND TENSION SETTING

FIG. 1307 SPECIFY: SIZE, STROKE, FIG. NO. 1307 LIMIT STOP  
W DIM., COMPRESSION SETTING AND TENSION SETTING

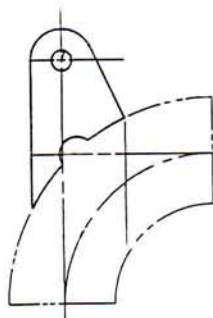
**SPECIAL DESIGN PRODUCTS**

The following products are special design per customer requirements. Contact Grinnell Co. for further information and how to order.

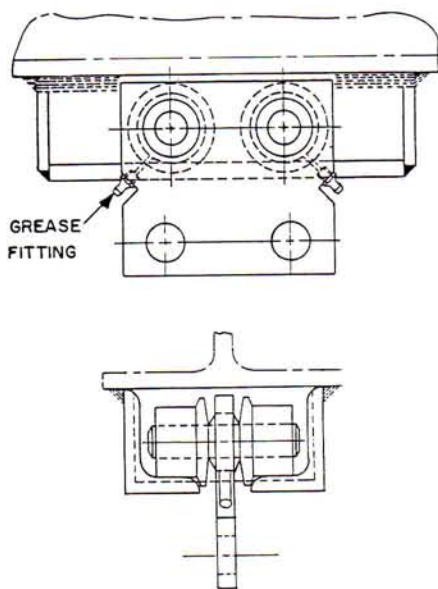
**half clamp  
fig. 38 SD**



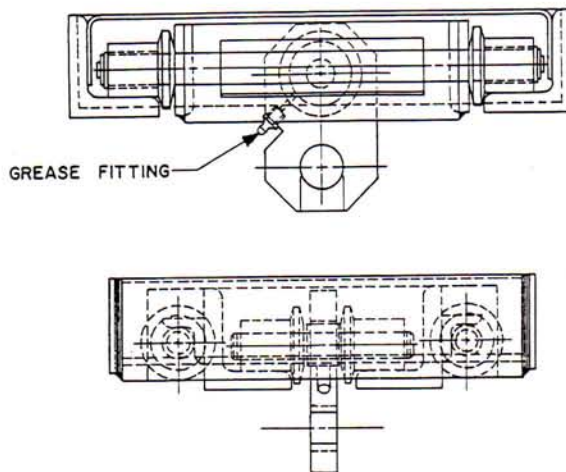
**welding lug for L.R. elbow  
fig. 53 SD**



**double roll horizontal traveler  
fig. 71 SD**

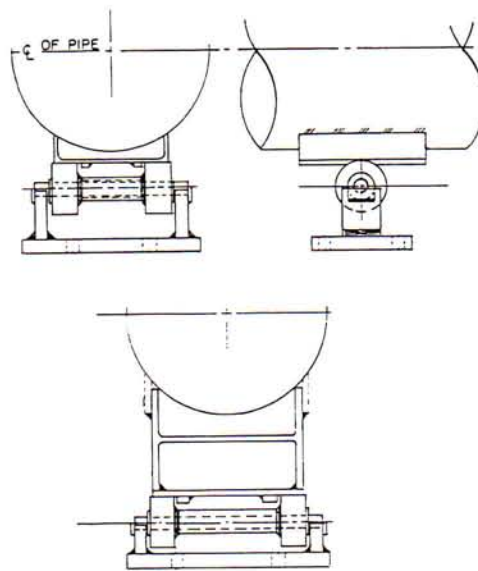


**dual direction horizontal traveler  
fig. 72 SD**



The Grinnell Fig. 71 and Fig. 72 Horizontal Travelers facilitate the supporting of piping systems subject to linear horizontal movements where head room is limited. Designed for use with Grinnell Pre-Engineered Variable Spring Hangers or Constant Supports it can also be used in conjunction with a rigid type hanger assembly.

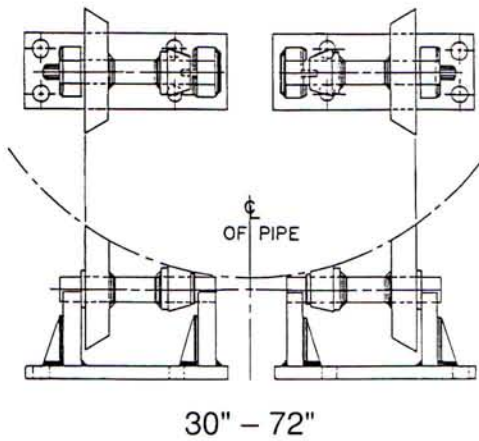
**flat roller with saddle  
fig. 75 SD**



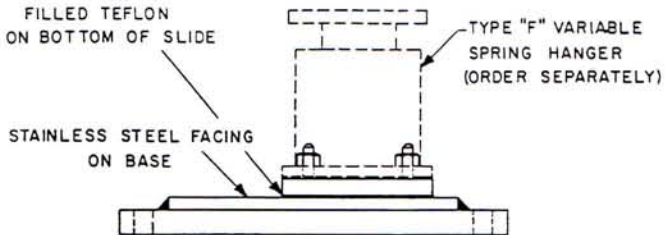
Pipe Sizes 4" - 42"

## SPECIAL DESIGN PRODUCTS Continued

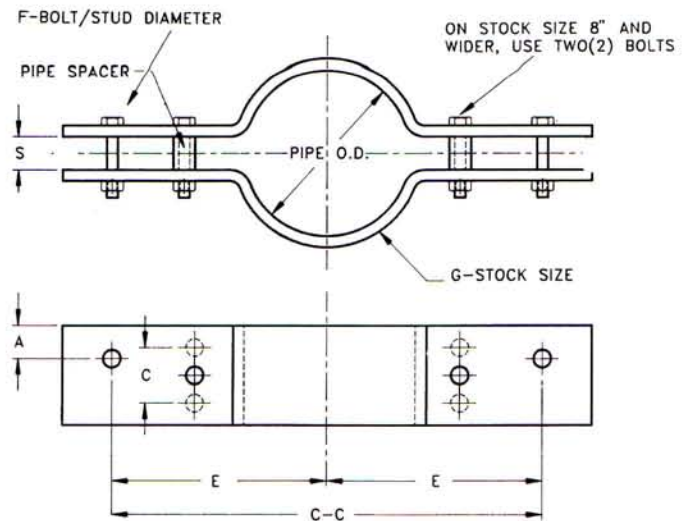
**fabricated roller for large dia. pipe  
fig. 76 SD**



**slide base  
fig. 77 SD  
for Type "F" variable spring hanger**



**riser clamp  
fig. 40 SD**



**MATERIAL:** Carbon steel  
chrome molybdenum or stainless steel.

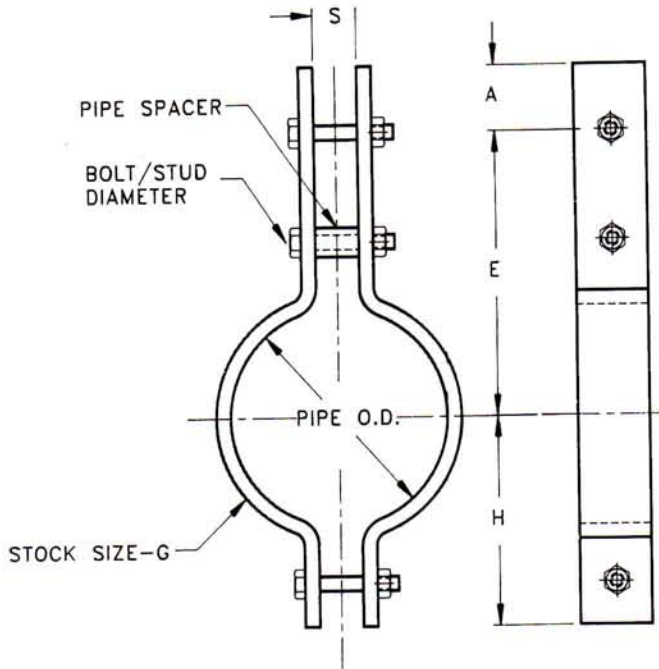
**FINISH:** Black, unless otherwise specified.  
Galvanized available.

**MAX TEMP.:** As required.

**ORDERING:** Specify fig. number 40 SD riser clamp special design, material, exact pipe size, load, operating temperature, insulation thickness, C-C dimension, rod diameter and if connected to a spring or rigid connection.

**SERVICE:** Riser Clamps are used for the support of vertical piping. Load is carried by shear lugs which are welded to the pipe. Shear lugs not provided.

non-standard  
three bolt pipe clamp,  
fig. 41 SD

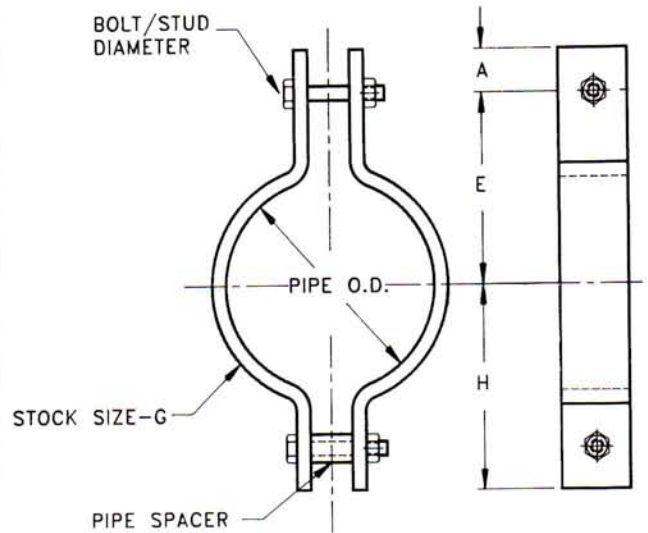


**TO ORDER SPECIFY:**

Fig. 41 SD Double Bolt Pipe Clamp, (Material Specification), (Pipe Size), Load, Operating Temperature, Insulation Thickness.

Alloy clamps, unless otherwise specified, will be furnished with alloy studs made from ASTM Spec. A-193-B7 stud stock with the center third unthreaded, and hex nuts.

non-standard  
two bolt pipe clamp,  
fig. 42 SD



**TO ORDER SPECIFY:**

Fig. 42 SD Pipe Clamp, (Material Specification), Pipe Size, Load, Temperature.

Alloy clamps, unless otherwise specified, will be furnished with alloy studs made from ASTM Spec. A-193-B7 stud stock with the center third unthreaded, and hex nuts.





# Pipe Hanger Specifications

## pipe hanger specifications

### A Typical Pipe Hanger Specification

#### 1. SCOPE

This specification shall apply for the design and fabrication of all hangers, supports, anchors, and guides. Where piping design is such that exceptions to this specification are necessary, the particular system will be identified, and the exceptions clearly listed through an addendum which will be made a part of the specification.

#### 2. DESIGN

(a) All supports and parts shall conform to the latest requirements of the ASME Code for Pressure Piping B31.1 and MSS Standard Practice SP-58, SP-69, SP-89 and SP-90 except as supplemented or modified by the requirements of this specification.

(b) Designs generally accepted as exemplifying good engineering practice, using stock or production parts, shall be utilized wherever possible.

(c) Accurate weight balance calculations shall be made to determine the required supporting force at each hanger location and the pipe weight load at each equipment connection.

(d) Pipe hangers shall be capable of supporting the pipe in all conditions of operation. They shall allow free expansion and contraction of the piping, and prevent excessive stress resulting from transferred weight being inducted into the pipe or connected equipment.

(e) Wherever possible, pipe attachments for horizontal piping shall be pipe clamps.

(f) For critical high-temperature piping, at hanger locations where the vertical movement of the piping is 1/2 inch or more, or where it is necessary to avoid the transfer of load to adjacent hangers or connected equipment, pipe hangers shall be an approved constant support design, as Grinnell Fig. 80-V and Fig. 81-H, or equal.

Where transfer of load to adjacent hangers or equipment is not critical, and where the vertical movement of the piping is less than 1/2 inch, variable spring hangers may be used, provided the variation in supporting effect does not exceed 25% of the calculated piping load through its total vertical travel.

(g) The total travel for constant support hangers will be equal to actual travel plus 20%. In no case will the difference between actual and total travel be less than 1 inch. The constant support hanger will have travel scales on both sides of the support frame to accommodate inspections.

(h) Each constant support hanger should be individually calibrated before shipment to support the exact load specified. The calibration record of each constant support shall be maintained for a

period of 20 years to assist the customer in any redesign of the piping system. Witness marks shall be stamped on the Load Adjustment Scale to establish factory calibration reference point.

(i) In addition to the requirements of ASTM-125 all alloy springs shall be shot peened and examined by magnetic particle. The spring rate tolerance shall be  $\pm 5\%$ . All three critical parameters (free height, spring rate and loaded height) of spring coils must be tested for. Each spring coil must be purchased with a C.M.T.R. and be of domestic manufacture.

(j) Constant supports should have a wide range of load adjustability. No less than 10% of this adjustability should be provided either side of the calibrated load for plus or minus field adjustment. Load adjustment scale shall be provided to aid the field in accurate adjustment of loads. Additionally, the constant support should be designed so that the load adjustments can be made without use of special tools and not have an impact on the travel capabilities of the supports.

(k) Constant supports shall be furnished with travel stops which shall prevent upward and downward movement of the hanger. The travel stops will be factory installed so that the hanger level is at the "cold" position. The travel stops will be of such design as to permit future re-engagement, even in the event the lever is at a position other than "cold", without having to make hanger adjustments.

(l) For non-critical, low temperature systems, where vertical movements up to 2 inches are anticipated, an approved pre-compressed variable spring design similar to Grinnell Fig. B-268 may be used. Where the vertical movement is greater than 2 inches, a variable spring hanger similar to Grinnell Fig. 98 may be used. Where movements are of a small magnitude, spring hangers similar to Grinnell Fig. 82 may be used.

(m) Each variable spring shall be individually calibrated at the factory and furnished with travel stops. Spring coils must be square to within  $1^\circ$  to insure proper alignment. Each spring coil must be purchased with a C.M.T.R. and be of domestic manufacture.

(n) All rigid rod hangers shall provide a means of vertical adjustment after erection.

(o) Where the piping system is subject to shock loads, such as seismic disturbances or thrusts imposed by the actuation of safety valves, hanger design shall include provisions for rigid restraints or shock absorbing devices of approved design, such as Grinnell Fig. 200 shock and sway suppressor, or equal.

## specifications - continued

- (p) Selection of vibration control devices shall not be part of the standard hanger contract. If vibration is encountered after the piping system is in operation, appropriate vibration control equipment shall be installed.
- (q) Hanger rods shall be subject to tensile loading only (see Table III). At hanger locations where lateral or axial movement is anticipated, suitable linkage shall be provided to permit swing.
- (r) Where horizontal piping movements are greater than 1/2 inch and where the hanger rod angularity from the vertical is less than or equal to 4 degrees from the cold to hot position of the pipe, the hanger pipe and structural attachments shall be offset in such manner that the rod is vertical in the hot position. When the hanger rod angularity is greater than 4 degrees from vertical, then structural attachment will be offset so that at no point with the rod angularity exceed 4 degrees from vertical.
- (t) Hangers shall be spaced in accordance with Tables I and II.
- (u) Where practical, riser piping shall be supported independently of the connected horizontal piping. Pipe support attachments to the riser piping shall be riser clamp lugs. Welded attachments shall be of material comparable to that of the pipe, and designed in accordance with governing codes.
- (v) Supports, guides, and anchors shall be so designed that excessive heat will not be transmitted to the building steel. The temperature of supporting parts shall be based on a temperature gradient of 100°F per inch distance from the outside surface of the pipe.
- (w) Hanger components shall not be used for purposes other than for which they were designed. They shall not be used for rigging and erection purposes.
- (x) Hydraulic Snubbers – The hydraulic units shall have a temperature stable control valve. The valve shall provide a locking and bleed rate velocity that provides for tamper proof settings. The fluid system shall utilize G.E. Silicone fluid with proven compatible seal made of ethylene-propylene approved compounds. The reservoir shall provide a fluid level indicator for exact reading of reservoir fluid level in any snubber orientation.
- The valve device shall offer a minimum amount of resistance to thermal movement. Any shock force shall cause the suppressor valve to close. With the suppressor valve closed the fluid flow shall essentially stop, thereby causing the unit to resist and absorb the disturbing forces. After the disturbing forces subside, the suppressor valve shall open again to allow free thermal movement of the piping. The suppressor shall have a means of regulating the amount of movement under shock conditions up to the design load for faulted condi-

tions without release of fluid. The suppressor design shall include a fluid bleed system to assure continued free thermal movement after the shock force subsides. The suppressor shall have a hard surfaced, corrosion resistant piston rod supported by a rod bushing. The assembly shall have self-aligning lubricated bushings and shall be designed so that it is capable of exerting the required force in tension and compression, utilizing the distance.

- (y) Paint – Variable spring and constant support units will be furnished painted with Stewart Bros. Green Semi-Gloss Primer (#10947). All other material will receive one shop coat of a red chromate primer meeting the requirements of Federal Specification TT-P-636.
- For corrosive conditions hangers will be galvanized or painted with carbo-zinc #11.
- (z) All threads are UNC unless otherwise specified.

#### Hanger Design Service

Hangers for piping 2-1/2 inch and larger, and all spring support assemblies, shall be completely engineered.

- (a) Engineered hanger assemblies shall be detailed on 8-1/2 inch x 11 inch sheets.
- Each sketch will include a location plan showing the location of the hanger in relation to columns of equipment.
- Each sketch will include an exact bill of material for the component parts making up each assembly.
- (b) Each engineered hanger assembly will be individually bundled and tagged as far as practical, ready for installation.
- Hanger material for piping 2 inch and smaller shall be shipped as loose material, identified by piping system only. A piping drawing marked with approximate hanger locations and types, and hanger sketches showing typical support arrangements will be furnished.
- (c) Hanger inspections shall be performed in accordance with MSS-SP89 (Section 7.7) and ASME B31.1 (Appendix V).

## specifications - continued

**Table I**

**Maximum horizontal spacing between pipe supports for standard weight steel pipe**

nominal pipe size, in.	1/2	3/4	1	1 1/2	2	2 1/2	3	3 1/2	4	5	6	8	10	12	14	16	18	20	24
maximum span, ft. wtr. serv.	7	7	7	9	10	11	12	13	14	16	17	19	22	23	25	27	28	30	32
vapor serv.	8	9	9	12	13	14	15	16	17	19	21	24	26	30	32	35	37	39	42
recommended hanger rod sizes	3/8			1/2			5/8		3/4		7/8		1		1		1 1/4	1 1/2	
	OR TRAPEZE																		

The above spacing and capacities are based on pipe filled with water. Additional valves and fittings increase the load and therefore closer hanger spacing is required. \*Many codes and specifications state "pipe hangers must be spaced every 10 ft., regardless of size." This local specification must be followed.

**Table II**

**Maximum horizontal spacing between copper tubing supports**

nominal tubing size, in.	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4
maximum span, ft. wtr. serv.	5	5	6	7	8	8	9	10	11	12
vapor serv.	6	7	8	9	10	11	13	14	15	16

Note: Spans shown in Tables I & II do not apply where there are concentrated loads between supports or where temperatures exceed 750°F.

**Table III**

**Load carrying capacities of threaded hanger rods. Materials - ASTM A36, A575 GR. 1020 or A576 GR1020**

nominal rod diameter, in.	root area of coarse thread square in.	maximum safe load, pounds rod temperature, 650°F
3/8	0.068	610
1/2	0.126	1130
5/8	0.202	1810
3/4	0.302	2710
7/8	0.419	3770
1	0.552	4960
1 1/4	0.889	8000
1 1/2	1.293	11630
1 3/4	1.744	15690
2	2.292	20690
2 1/4	3.021	27200
2 1/2	3.716	33500
2 3/4	4.619	41600
3	5.621	50600
3 1/4	6.720	60500
3 1/2	7.918	71260
3 3/4	9.214	82890
4	10.608	95500
4 1/4	12.100	108900
4 1/2	13.690	123200
4 3/4	15.379	138400
5	17.165	154500

Standard UNC thread thru 3" dia. and 8-UN-2A thread series for 3 1/4" dia. and larger.

Technical Data  
Section

CHARTS AND TABLES

THERMAL EXPANSION OF PIPE MATERIALS — INCHES PER FOOT

THERMAL EXPANSION OF PIPE MATERIALS — INCHES PER FOOT

Temp. °F	Carbon Steel • Carbon-Moly Steel • Low-Chrome Steel (Thru 3% Cr)										Austenitic Stainless Steels (304, 316, 347)									
	0	10	20	30	40	50	60	70	80	90	0	10	20	30	40	50	60	70	80	90
-200	.0180	.0187	.0192	.0198	.0203	.0209	.0215	.0220	.0225	.0230	-.0281	-.0295	-.0305	-.0314	-.0324	-.0334	-.0343	-.0353	-.0362	-.0372
-100	.0121	.0127	.0133	.0140	.0146	.0152	.0158	.0163	.0169	.0174	-.0187	-.0197	-.0207	-.0216	-.0226	-.0236	-.0245	-.0254	-.0263	-.0272
-0	.0051	.0058	.0065	.0073	.0080	.0087	.0096	.0103	.0109	.0116	-.0078	-.0089	-.0100	-.0112	-.0123	-.0134	-.0145	-.0155	-.0166	-.0176
0	.0051	.0044	.0037	.0029	.0022	.0015	.0007	.0000	.0008	.0015	-.0078	-.0067	-.0056	-.0044	-.0033	-.0022	-.0011	.0000	.0012	.0023
100	.0023	.0030	.0038	.0046	.0053	.0061	.0068	.0076	.0084	.0091	.0034	.0045	.0056	.0068	.0079	.0090	.0101	.0112	.0124	.0135
200	.0099	.0107	.0116	.0124	.0132	.0141	.0149	.0157	.0165	.0174	.0146	.0158	.0169	.0181	.0192	.0203	.0215	.0227	.0238	.0250
300	.0182	.0191	.0200	.0208	.0217	.0226	.0235	.0244	.0252	.0261	.0261	.0273	.0285	.0297	.0309	.0321	.0332	.0344	.0356	.0368
400	.0270	.0279	.0288	.0298	.0307	.0316	.0325	.0334	.0344	.0353	.0380	.0392	.0404	.0416	.0428	.0440	.0453	.0465	.0477	.0489
500	.0362	.0372	.0382	.0391	.0401	.0411	.0421	.0431	.0440	.0450	.0501	.0513	.0526	.0538	.0550	.0562	.0575	.0587	.0599	.0612
600	.0460	.0470	.0481	.0491	.0501	.0512	.0522	.0532	.0542	.0553	.0624	.0637	.0649	.0662	.0674	.0687	.0700	.0712	.0725	.0737
700	.0563	.0574	.0584	.0595	.0606	.0617	.0627	.0638	.0649	.0659	.0750	.0763	.0776	.0789	.0802	.0815	.0828	.0841	.0854	.0867
800	.0670	.0681	.0692	.0703	.0714	.0726	.0737	.0748	.0759	.0770	.0880	.0893	.0906	.0920	.0933	.0946	.0959	.0972	.0986	.0999
900	.0781	.0792	.0803	.0813	.0824	.0835	.0846	.0857	.0867	.0878	.1012	.126	.1039	.1053	.1066	.1080	.1094	.1107	.1121	.1134
1000	.0889	.0901	.0912	.0924	.0935	.0946	.0958	.0970	.0981	.0993	.1148	.1162	.1175	.1189	.1202	.1216	.1229	.1243	.1257	.1270
1100	.1004	.1015	.1025	.1036	.1046	.1057	.1068	.1078	.1089	.1099	.1284	.1298	.1311	.1325	.1338	.1352	.1366	.1379	.1393	.1406
1200	.1110	.1121	.1132	.1144	.1155	.1166	.1177	.1188	.1200	.1211	.1420	.1434	.1447	.1461	.1474	.1488	.1502	.1515	.1529	.1542
1300	.1222	.1233	.1244	.1256	.1267	.1278	.1299	.1320	.1342	.1363	.1556	.1570	.1583	.1597	.1610	.1624	.1638	.1651	.1665	.1678
1400	.1334										.1692	.1704	.1717	.1731	.1744	.1757	.1771	.1784	.1796	.1811



# Grinnell

## steel pipe data

### schedule 40 & 80

nom. pipe size	schedule no.	O.D.	wall thick.	wt. per foot	wt. of water per foot
3/8	40	.675	.091	.567	.083
	80		.126	.738	.061
1/2	40	.840	.109	.850	.132
	80		.147	1.087	.101
3/4	40	1.050	.113	1.130	.230
	80		.154	1.473	.186
1	40	1.315	.133	1.678	.374
	80		.179	2.171	.311
1 1/4	40	1.660	.140	2.272	.647
	80		.191	2.996	.555
1 1/2	40	1.900	.145	2.717	.882
	80		.200	3.631	.765
2	40	2.375	.154	3.652	1.452
	80		.218	5.022	1.279
2 1/2	40	2.875	.203	5.790	2.072
	80		.276	7.660	1.834
3	40	3.500	.216	7.570	3.200
	80		.300	10.250	2.860
3 1/2	40	4.000	.226	9.110	4.280
	80		.318	12.510	3.850
4	40	4.500	.237	10.790	5.510
	80		.337	14.980	4.980
5	40	5.563	.258	14.620	8.660
	80		.375	20.780	7.870
6	40	6.625	.280	18.970	12.510
	80		.432	28.570	11.290
8	40	8.625	.322	28.550	21.600
	80		.500	43.390	19.800
10	40	10.750	.365	40.480	34.100
	80		.593	64.400	31.100
12	40	12.750	.406	53.600	48.500
	80		.687	88.600	44.000
14	40	14.000	.437	63.000	58.500
	80		.750	107.000	51.200
16	40	16.000	.500	83.000	76.500
	80		.843	137.000	69.700
18	40	18.000	.563	105.000	97.200
	80		.937	171.000	88.500
20	40	20.000	.593	123.000	120.400
	80		1.031	209.000	109.400
24	40	24.000	.687	171.000	174.200
	80		1.218	297.000	158.200
30	20	30.000	.500	158.000	286.000
36	API	36.000	.500	190.000	417.000

1 Cubic ft. of Water Weighs 62.35 lbs.

1 Gallon (U.S.) Weighs 8.335 lbs.



## Copper Tube Data

### TYPE L

NOM. TUBE SIZE	O.D. TUBING	O.D.	WALL THICK.	WT. PER FT.	WT. OF WATER PER FT. LBS.
1/4	3/8	.375	.030	.126	.034
3/8	1/2	.500	.035	.198	.062
1/2	5/8	.625	.040	.285	.100
5/8	3/4	.750	.042	.362	.151
3/4	7/8	.875	.045	.455	.209
1	1 1/8	1.125	.050	.655	.357
1 1/4	1 3/8	1.375	.055	.884	.546
1 1/2	1 5/8	1.625	.060	1.14	.767
2	2 1/8	2.125	.070	1.75	1.341
2 1/2	2 3/8	2.625	.080	2.48	2.064
3	3 1/8	3.125	.090	3.33	2.949
3 1/2	3 3/8	3.625	.100	4.29	3.989
4	4 1/8	4.125	.110	5.38	5.188
5	5 1/8	5.125	.125	7.61	8.081
6	6 1/8	6.125	.140	10.20	11.616
8	8 1/8	8.125	.200	19.29	20.289
10	10 1/8	10.125	.250	30.10	31.590
12	12 1/8	12.125	.280	40.40	45.426

### TYPE K

NOM. TUBE SIZE	O.D. TUBING	O.D.	WALL THICK.	WT. PER FT.	WT. OF WATER PER FT. LBS.
1/4	3/8	.375	.035	.145	.032
3/8	1/2	.500	.049	.269	.055
1/2	5/8	.625	.049	.344	.094
5/8	3/4	.750	.049	.418	.144
3/4	7/8	.875	.065	.641	.188
1	1 1/8	1.125	.065	.839	.337
1 1/4	1 3/8	1.375	.065	1.04	.527
1 1/2	1 5/8	1.625	.072	1.36	.743
2	2 1/8	2.125	.083	2.06	1.310
2 1/2	2 3/8	2.625	.095	2.92	2.000
3	3 1/8	3.125	.109	4.00	2.960
3 1/2	3 3/8	3.625	.120	5.12	3.900
4	4 1/8	4.125	.134	6.51	5.060
5	5 1/8	5.125	.160	9.67	8.000
6	6 1/8	6.125	.192	13.87	11.200
8	8 1/8	8.125	.271	25.90	19.500
10	10 1/8	10.125	.338	40.30	30.423
12	12 1/8	12.125	.405	57.80	43.675

## Cast Iron Pipe Data

Mechanical Joint Pipe Class 150

Approximately same weight for Bell & Spigot

Flange Cast Iron Pipe Add Weight of Flanges

NOM. PIPE SIZE	CLASS	O.D. C.I. PIPE	WALL THICK.	WT. PER FT.	WT. OF WATER PER FT./LBS.
3	150	3.96	.32	12.2	3.73
4	150	4.80	.35	16.4	5.72
6	150	6.90	.38	25.7	12.80
8	150	9.05	.41	36.7	23.10
10	150	11.10	.44	48.7	35.50
12	150	13.20	.48	62.9	51.00
14	150	15.30	.51	78.8	69.30
16	150	17.40	.54	95.0	90.30
18	150	19.50	.58	114.7	114.00
20	150	21.60	.62	135.9	141.50
24	150	25.80	.73	190.4	201.00
30	150	32.00	.85	277.3	312.00
36	150	38.30	.94	368.9	449.00
42	150	44.50	1.05	479.1	612.00
48	150	50.80	1.14	595.2	803.00

## Glass Pipe Data

### REGULAR SCHEDULE

NOM. PIPE SIZE	O.D.	WALL THICK.	WT. PER FT.	WT. OF WATER PER FT.
1½	1.84	.12	.64	.89
2	2.34	.14	.94	1.45
3	3.41	.17	1.60	3.19
4	4.53	.20	2.60	5.79
6	6.66	.24	4.70	12.78

### HEAVY SCHEDULE

NOM. PIPE SIZE	O.D.	WALL THICK.	WT. PER FT.	WT. OF WATER PER FT.
1	1.31	.16	.60	.35
1½	1.84	.17	.87	.76
2	2.34	.17	1.10	1.36
3	3.41	.20	2.00	3.06
4	4.53	.26	3.40	5.44
6	6.66	.33	6.30	12.42

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

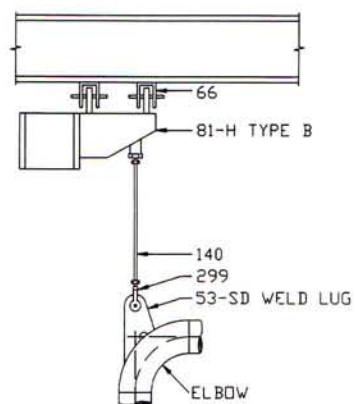
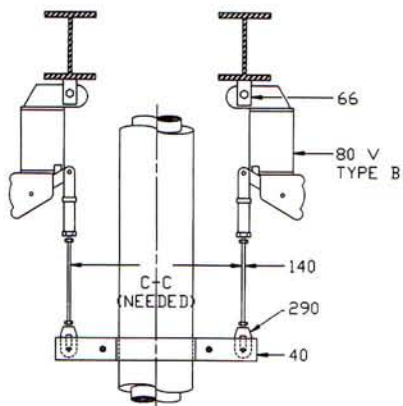
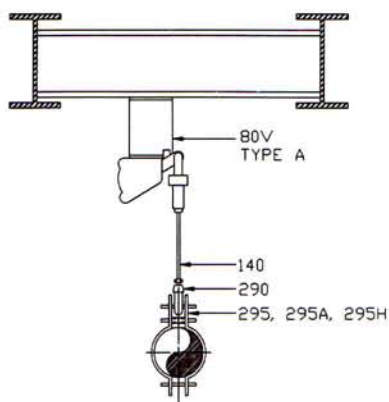
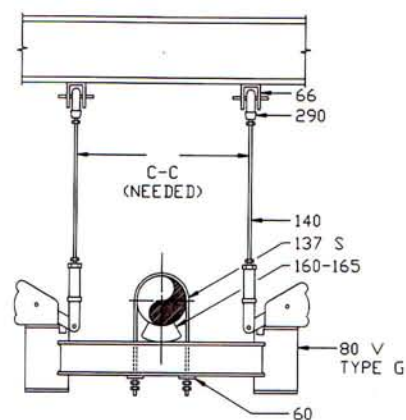
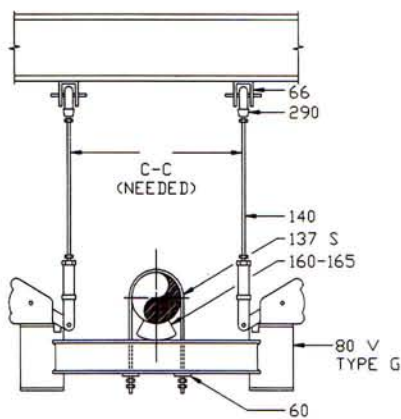
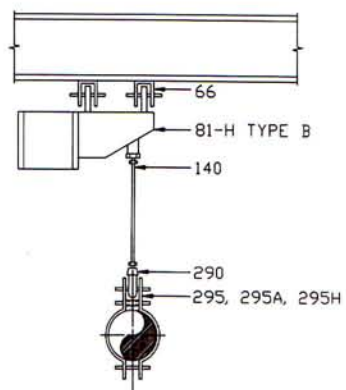
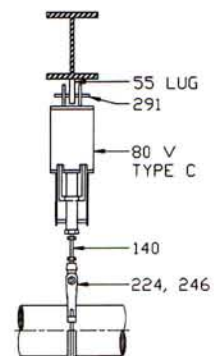
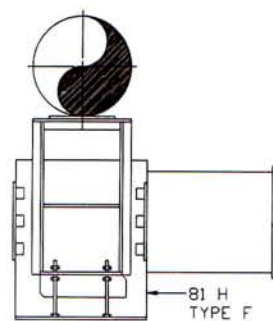
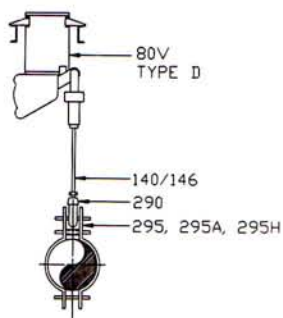
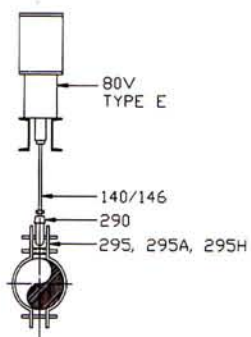
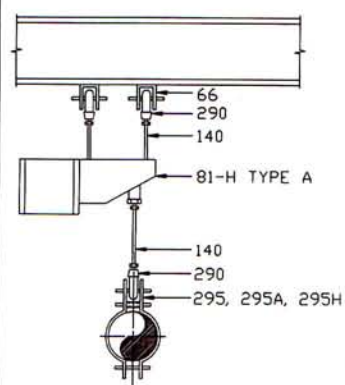
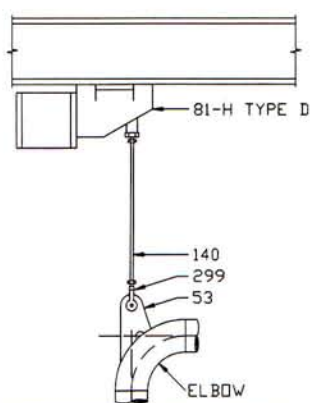
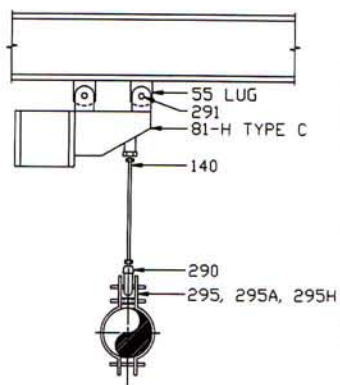
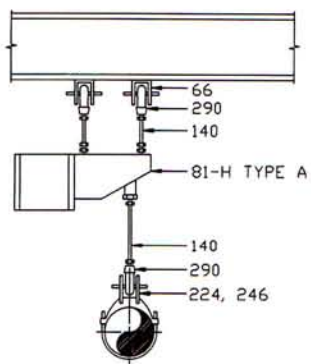
Maximum Recommended Applied Torques,  
for Fig. 261 Riser Clamp  
For Bolted Parts ASTM-A307 Bolts  
ASTM-A563 Nuts

BOLT SIZE	TORQUE VALUE (FT.-LBS.)
¼	6
⅜	21
½	46
⅝	100
¾	150
7/8	190
1	280

Maximum Recommended Applied Torques, For  
Set Screws in MSS Types 19 and 23 C-Clamps  
(Extracted From MSS-SP-69)

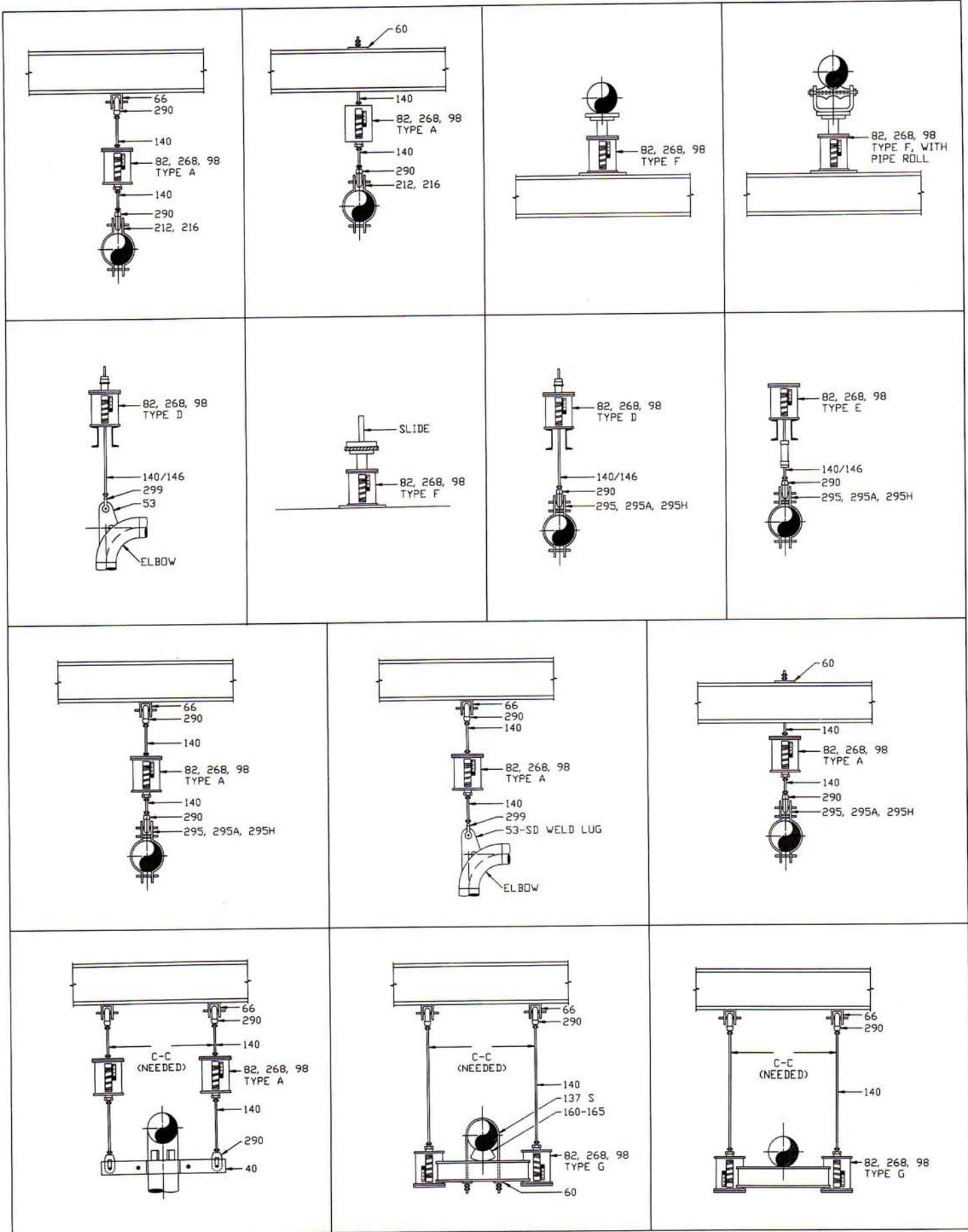
THREAD SIZE	TORQUE VALUE (IN.-LBS.)
¼	40
⅜	60
½	125
⅝	250
¾	400
7/8	665

**TYPICAL HANGER ASSEMBLIES  
RECOMMENDED BY  
GRINNELL CORPORATION  
Shown on the following  
pages ph-171 thru ph-176**



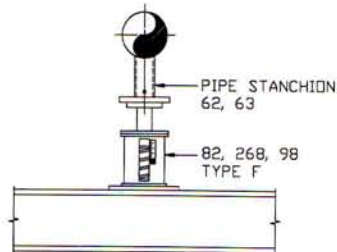
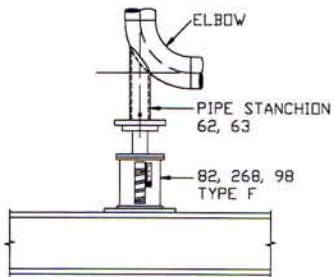
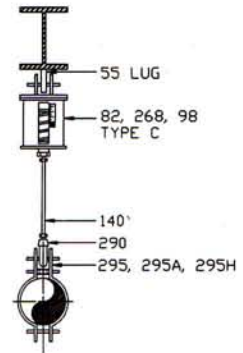
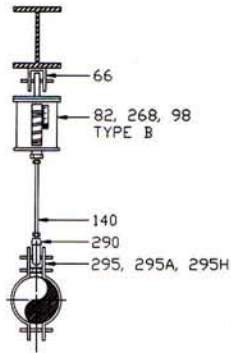
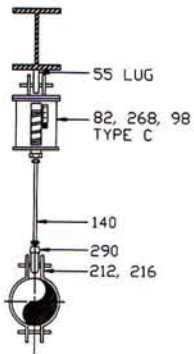
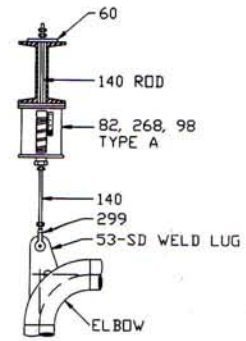
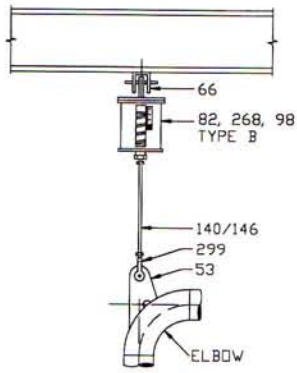
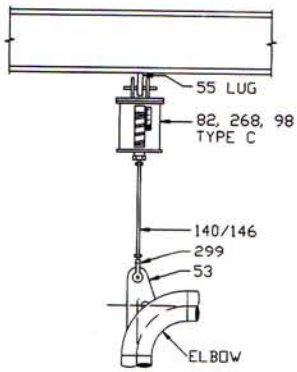
# Springs

# Grinnell



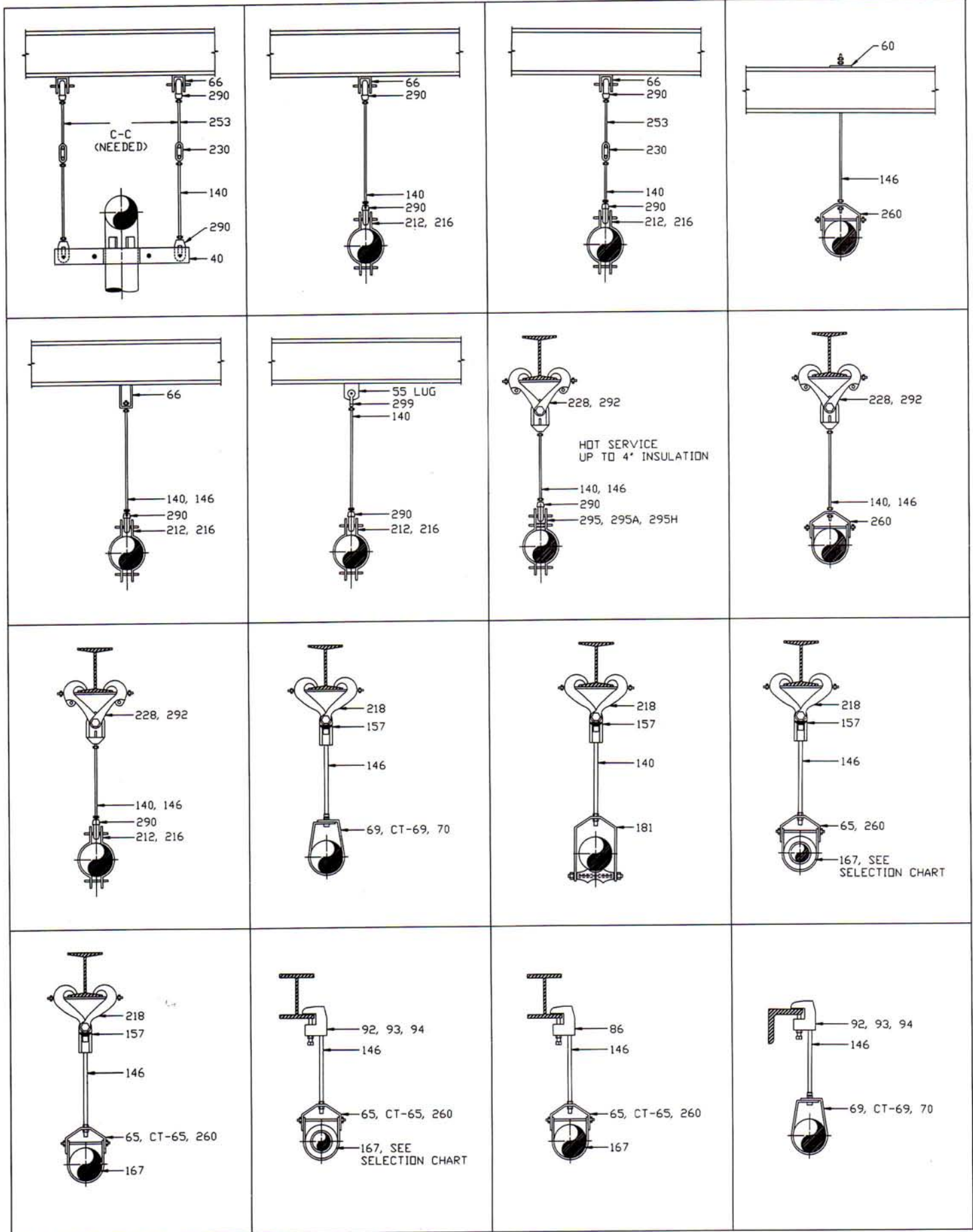
# Grinnell

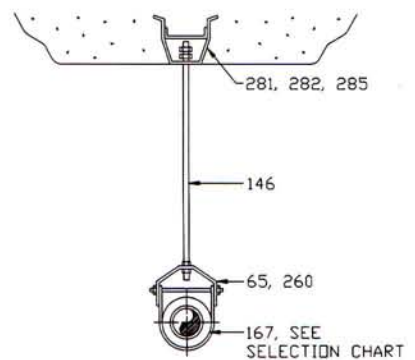
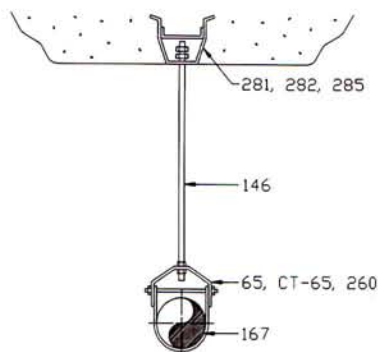
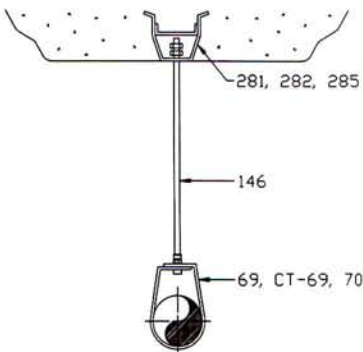
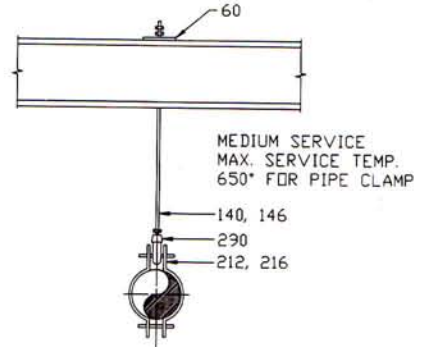
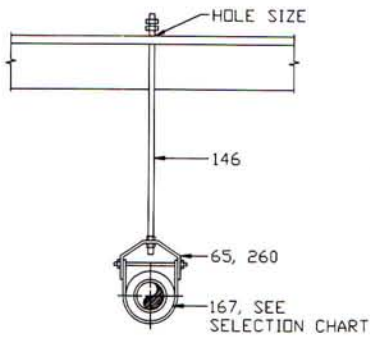
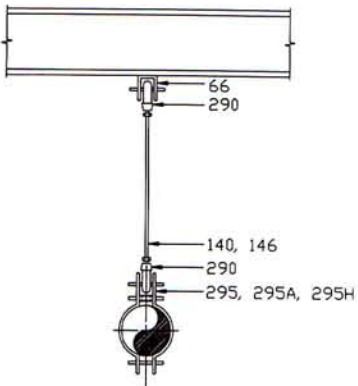
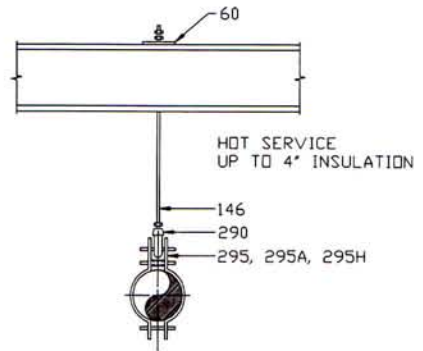
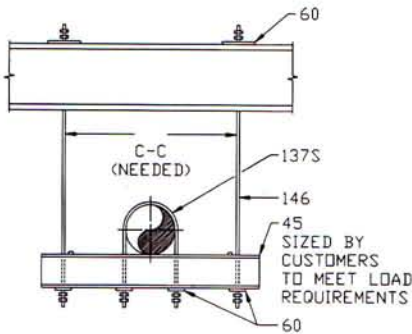
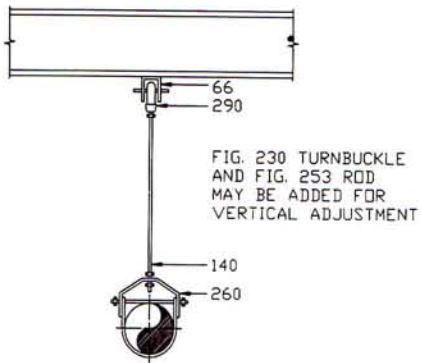
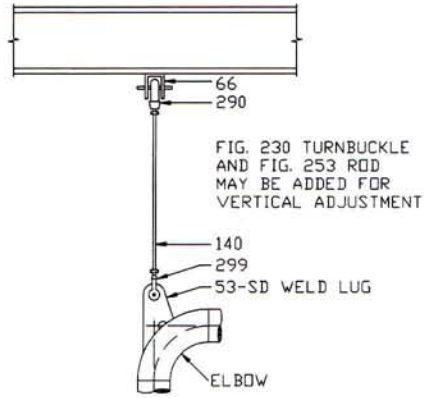
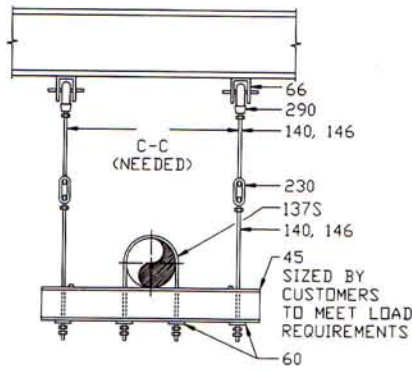
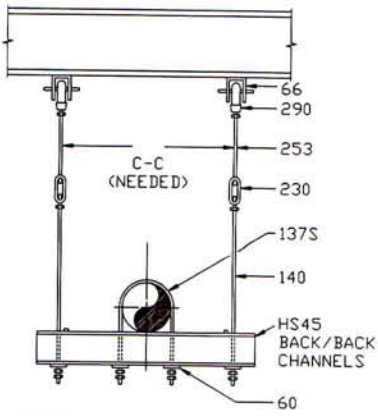
# Springs



# Rigid Hangers

Grinnell

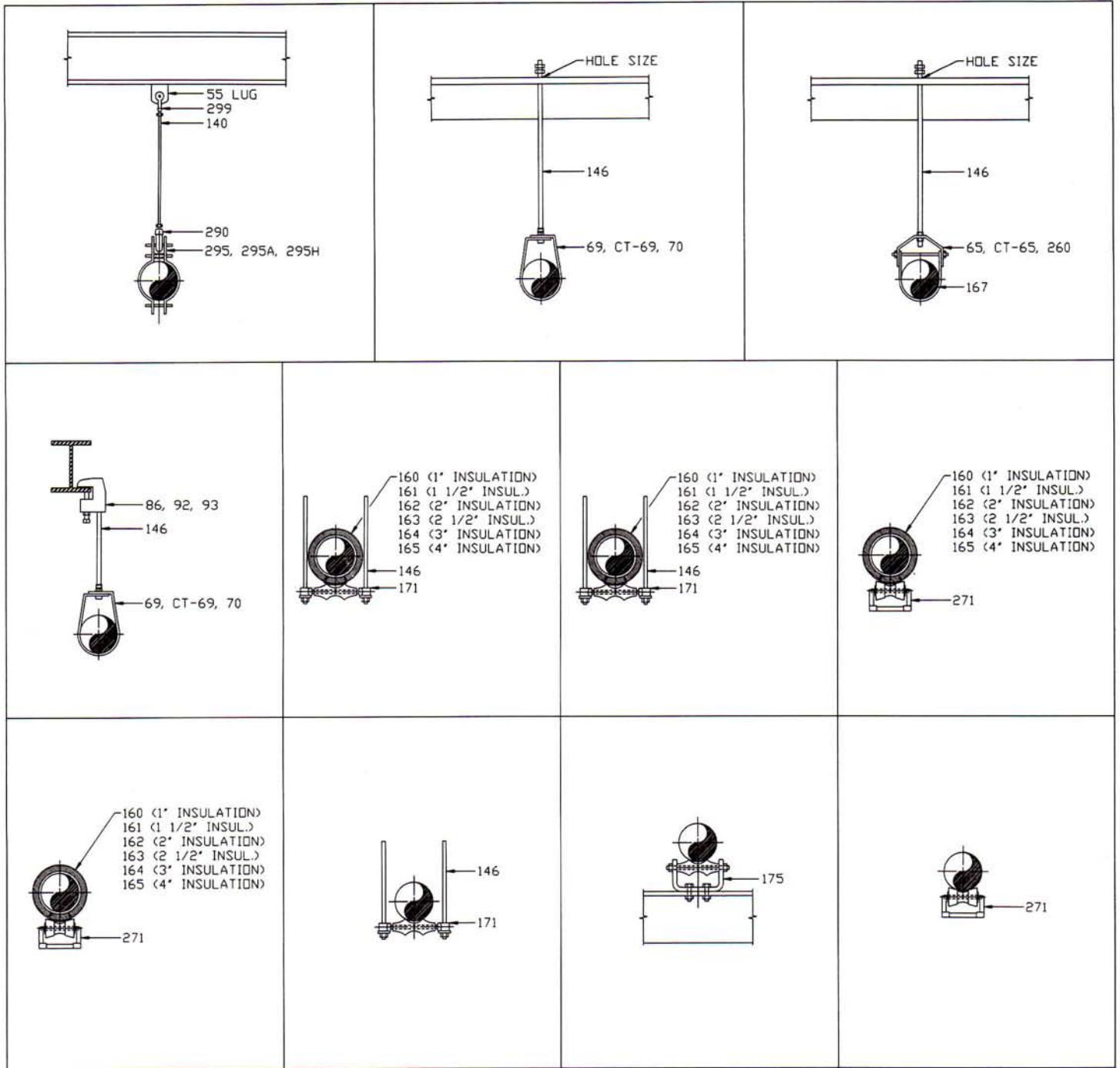






# Rigid Hangers

# Grinnell



# Grinnell Pipe Hangers and Supports

- **HARDWARE HANGERS:**

Complete Product Line of:  
Carbon Steel, Stainless Steel  
Cast Iron, Malleable Iron  
Copper & PVC Coated  
Galvanized & Painted

- **ENGINEERED HANGERS:**

Variable Springs  
Constant Supports  
Hydraulic Snubbers  
Vibration Sway Braces  
Sway Struts  
Limit Stops

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

## TECHNICAL SERVICES

- **DESIGN:**

Design services, either on or off site, help you maximize the efficiency of your pipe support systems. These services include:

- Pipe Hanger design and engineering
- Manual and computer-aided drafting
- Finite-element modeling
- System Analysis
- Pipe Stress Analysis
- Product qualification testing  
(environmental static and cycling loads, flow and leak)
- Supervision of client design personnel

- **HYDRAULIC SNUBBERS:**

The Pipe Support Division has the technical expertise, manufacturing facilities and testing equipment to provide extensive design, installation, maintenance and repair or rebuild services for hydraulic shock suppressors.

- On site service available by certified technicians for fossil and nuclear plants.

## GRINNELL MARKETS

- Fire Protection
- Mechanical HVAC/Plumbing
- Industrial
- Petro Chemical
- Refinery
- Pulp & Paper
- Waste Water, Water Treatment
- Marine
- Co-generation
- Fossil Power
- Nuclear Power

## PIPE HANGERS SPECIFICATIONS

- Federal Spec WW-H-171E
- MSS-SP-58, MSS-SP-69
- UL-FM
- NFPA
- B31.1 Fossil Power Plants
- B31.3 Petro, Chem, Refinery
- ASME Nuclear Power Plants
- MIL Spec P-15877 Marine Hangers

- **PLANT SERVICES:**

- Support walkdowns and verification
- Support adjustments and materials
- QA inspection and verification
- Integrity Analysis
- Non-destructive Testing
- Training Programs

- **NUCLEAR:**

Services geared to nuclear power market include:

- Section XI Services
- QA/QC services for on-site or off-site work
- Compliance with NRC directives involving piping systems and components
- Accredited by and granted an "NPT" Nuclear Certificate of Authorization
- Assessed and Quality activities verified by NUPIC and various individual utilities
- Commercial grade dedication program

## Conditions and terms of sale

1. **CONTROLLING PROVISIONS:** These terms and conditions shall control with respect to any purchase order or sale of Seller's products. No waiver, alteration or modification of these terms and conditions whether on Buyer's purchase order or otherwise shall be valid unless the waiver, alteration or modification is specifically accepted in writing and signed by an authorized representative of Seller.
2. **DELIVERY:** Seller will make every effort to complete delivery of products as indicated on Seller's acceptance of an order, but Seller assumes no responsibility or liability, and will accept no back-charge, for loss or damage due to delay or inability to deliver caused by acts of God, war, labor difficulties, accident, delays of carriers, by contractors or suppliers, inability to obtain materials, shortages of fuel and energy, or any other causes of any kind whatever beyond the control of Seller. Seller may terminate any contract of sale of its products without liability of any nature, by written notice to Buyer, in the event that the delay in delivery or performance resulting from any of the aforesaid causes shall continue for a period of sixty (60) days. Under no circumstances shall Seller be liable for any special or consequential damages or for loss, damage, or expense (whether or not based on negligence) directly or indirectly arising from delays or failure to give notice of delay.
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11. **MINIMUM INVOICE:** \$25.00 plus transportation.
12. **TERMS:** Cash, net 30 days unless otherwise specified.

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- Malleable iron, screwed/unions
- Cast brass, solid joint/threaded
- Wrot copper, solder joint
- Plastic, ABS & PVC for DWV
- Forged steel
- Steel pipe couplings
- Mechanical joint
- Oil field fittings

### • VALVES

- Butterfly
- Ball, metal & plastic
- Diaphragm
- Forged steel
- Plug valves
- Bronze & iron, gate, globe, check
- Detector check
- Knife gate
- Backflow prevention devices

### • WELDED FITTINGS AND FLANGES

### • STEEL PIPE NIPPLES

### • PIPE HANGERS

### • UNIT HEATERS (HYDRONIC & GAS FIRED)

### • PLASTIC PIPE, ABS & PVC

### • GRUVLOK COUPLINGS & FITTINGS

### • A.W.W.A. PRODUCTS

### • POWER-STRUT CHANNEL FRAMING

### • STEEL PIPE



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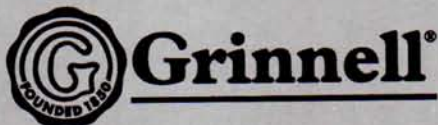
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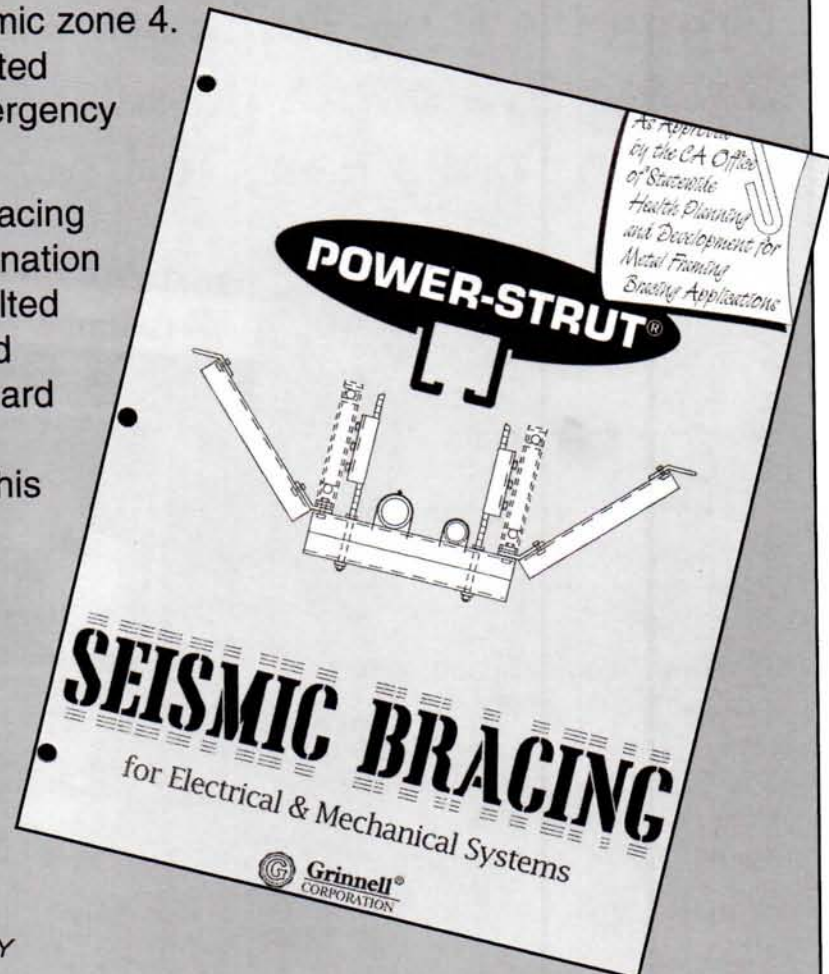
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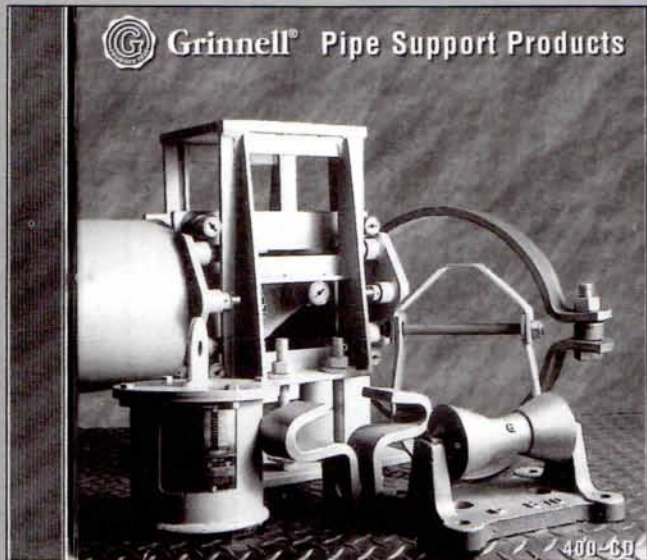
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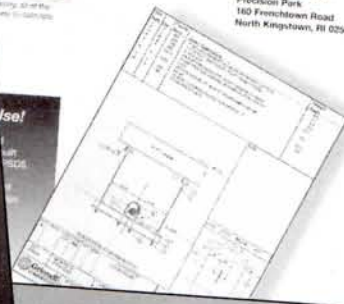
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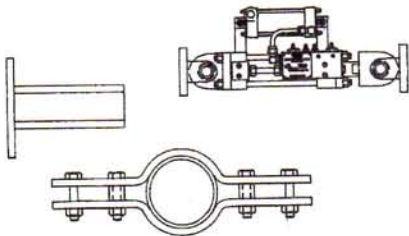
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