

## Triple Spring: Standard

Type:  A,  B,  C,  D,  E,  F,  G

## Triple Spring-CR: Corrosion Resistant

Type:  A,  B,  C,  D,  E,  F,  G

## Triple Spring Hangers

### Design features:

- Precompression.
  - Precompressing the spring into the hanger casing provides the following advantages:
    - (1) Saves up to 50% in headroom by reducing the length of the hanger.
    - (2) Reduces the installed height of the overall hanger assembly.
    - (3) Prevents the spring supporting force from exceeding the normal safe limits of variations.
    - (4) Saves valuable erection time because spring is precompressed close to 1/2" of the working range.
- Calibration: all Anvil Variable Spring Hangers and supports are calibrated for accurate loading conditions.
- Load indicator is clearly seen in the slot, simplifying reading of the scale plate. Load is read from bottom of indicator.
- Cold set at the factory upon request.
- Spring and casing are fabricated of steel and are rugged and compact.
- Piston cap serves as a centering device or guide maintaining spring alignment.
- Casing protects the spring from damage and weather conditions.

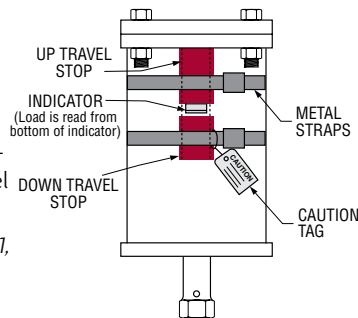
**Standard Finish:** Painted with semi-gloss primer.

**Corrosion Resistant:** Anvil offers corrosion-resistant and weather-resistant Variable Spring Hangers to fill vital needs in the chemical and refinery industries as well as in modern outdoor power plant construction. For protection against severe weather conditions or moderate corrosive conditions, the parts of the hanger are galvanized per ASTM A-153, except the spring which has a protective coating and the load column for Type F which is electro-galvanized.

### Advantages of a Protective Coating:

- Protects from a wide range of corrosives.
- Does not affect the flex life of the spring.
- Recommended for ambient temperatures up to 200° F

**Travel stop:** The functional design of the pre-compressed variable spring hanger permits the incorporation of a two-piece travel stop that locks the hanger spring against upward or downward movement for temporary conditions of underload or overload. The complete travel stop, the up travel stop only for cold set purposes or the down travel stop only which may be employed during erection, hydrostatic test (Anvil permits a hydrostatic test load of 2 times the normal operating load for the spring hanger) or chemical cleanout will be furnished only when specified. The travel stop is painted red and is installed at the factory with a caution tag attached calling attention that the device must be removed before the pipe line is put in service. Permanently attached travel stops available upon request.



**Approvals:** WW-H-171E (Types 51, 56 and 57), ANSI/MSS SP-69 and MSS SP-58 (Types 51, 52 and 53).

**Specifications:** Anvil Variable Spring Hangers are welded in strict accordance with ASME Section IX.

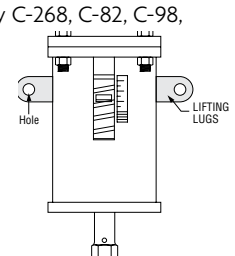
**Size Range:** The Anvil Variable Spring Hanger in five series and seven types is offered in twenty-three sizes (Fig. B-268 only is offered in twenty-five sizes). The hanger can be furnished to take loads 10 lbs. to 50,000 lbs.

### Ordering:

- (1) Size
- (2) Type
- (3) Figure number
- (4) Product name
- (5) Desired supporting force in operating position
- (6) Calculated amount and direction of pipe movement from installed to operating position.
- (7) Customer's identification number (if any)
- (8) When ordering Type F spring specify if roller or guided load column is to be furnished.
- (9) When ordering Type G, specify total load and load per spring plus center to center rod dimensions.
- (10) If required, specify with travel stop
- (11) When ordering corrosion resistant, specify C-268, C-82, C-98, Triple-CR, or Quadruple-CR "completely galvanized except coated spring coil".

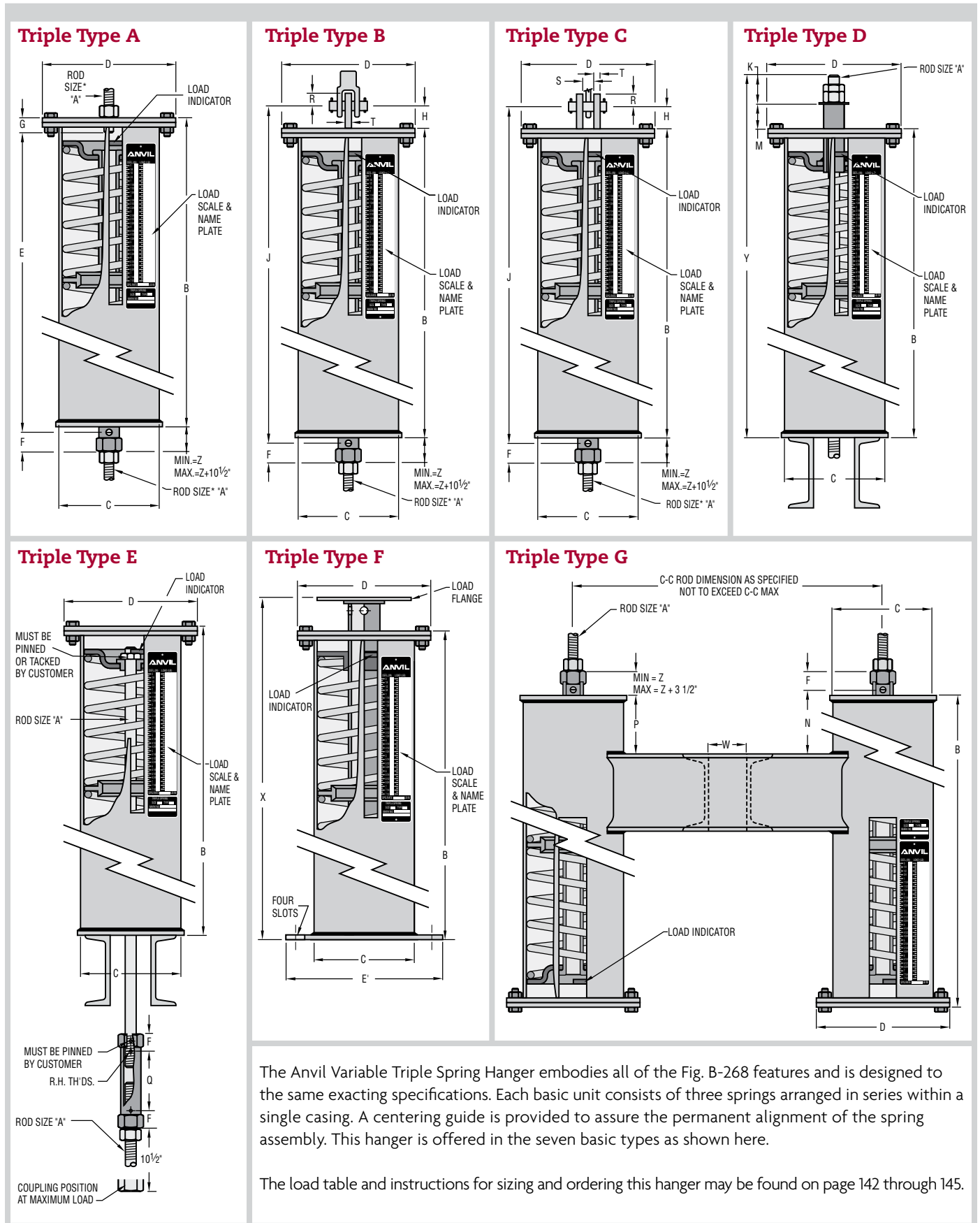
### Note:

To help alleviate the problem of lifting large size spring hangers into position for installation, this product is available with lifting lugs (if required) on sizes weighing one hundred pounds or more.



| PROJECT INFORMATION |  | APPROVAL STAMP                             |  |
|---------------------|--|--|--|
| Project:            |  | <input type="checkbox"/> Approved          |  |
| Address:            |  | <input type="checkbox"/> Approved as noted |  |
| Contractor:         |  | <input type="checkbox"/> Not approved      |  |
| Engineer:           |  | Remarks:                                   |  |
| Submittal Date:     |  |  |  |
| Notes 1:            |  |  |  |
| Notes 2:            |  |  |  |

## Triple Spring, Triple Spring-CR



# SPRING HANGERS



## TRIPLE SPRING: DIMENSIONS (IN)

| Hanger Size | General Dimensions |                    |                 |               |              |         | Rod Take Out For Types |          |          |         |       | Type A         | Type D   |         | Type F              |          | Type G |        |
|-------------|--------------------|--------------------|-----------------|---------------|--------------|---------|------------------------|----------|----------|---------|-------|----------------|----------|---------|---------------------|----------|--------|--------|
|             | Rod Size A         | R.H. Thread Length | Casing Length B | Casing Dia. C | Min Thread F | Z       | A                      | B & C    | D        | E       | G     | Depth Thread G | K        | M       | Loaded Length Dim X |          | P      |        |
|             |                    |                    |                 |               |              |         | E                      | J        | Y        | Q       | N     |                |          |         | Min                 | Max      |        |        |
| 0           | 1/2                | 12                 | 19 1/8          | 4             | 1 5/16       | 1 5/16  | 19 1/8                 | 20 5/8   | 28 1/8   | 11 1/8  | 1 1/2 | 7/16           | 1 1/4    | 7 3/4   | 20 15/16            | 22 15/16 | 1 1/2  |        |
| 1           |                    |                    | 21 3/4          |               |              |         | 23 1/4                 | 30 3/4   | 23 9/16  |         |       |                |          |         | 25 9/16             |          |        |        |
| 2           |                    |                    | 24              |               |              |         | 25 1/2                 | 33       | 25 13/16 |         |       |                |          |         | 27 9/16             |          |        |        |
| 3           | 1/2                | 12                 | 21 3/16         | 5 9/16        | 1 5/16       | 1 5/16  | 21 3/16                | 22 1/16  | 30 3/16  | 11 1/8  | 2     | 7/16           | 1 1/4    | 7 3/4   | 23                  | 25       | 2      |        |
| 4           |                    |                    | 23 1/16         |               |              |         | 24 9/16                | 32 1/16  | 24 7/8   |         |       |                |          |         | 26 7/8              |          |        |        |
| 5           |                    |                    | 25 1/8          |               |              |         | 26 5/8                 | 34 1/8   | 26 15/16 |         |       |                |          |         | 28 15/16            |          |        |        |
| 6           | 5/8                | 12                 | 25              | 6 5/8         | 1 5/16       | 1 5/16  | 25                     | 26 1/2   | 34 3/16  | 11 1/8  | 2     | 5/8            | 1 1/2    | 7 11/16 | 26 15/16            | 28 15/16 | 2      |        |
| 7           |                    | 13                 | 27 15/16        |               |              |         | 29 1/16                | 37 1/8   | 29 7/8   |         |       |                |          |         | 31 7/8              |          |        |        |
| 8           |                    |                    | 29 5/16         |               |              |         | 30 13/16               | 38 1/2   | 31 1/4   |         |       |                |          |         | 33 1/4              |          |        |        |
| 9           | 3/4                | 13                 | 29 9/16         | 8 5/8         | 1 1/4        | 1 1/4   | 29 9/16                | 31 1/16  | 38 7/8   | 11 1/2  | 3     | 1              | 1 3/4    | 7 9/16  | 31 5/8              | 33 5/8   | 3      |        |
| 10          |                    |                    | 33 1/4          |               |              |         | 34 3/4                 | 42 9/16  | 35 5/16  |         |       |                |          |         | 37 5/16             |          |        |        |
| 11          |                    |                    | 26 11/16        |               |              |         | 28 3/16                | 36       | 28 3/4   |         |       |                | 30 3/4   |         |                     |          |        |        |
| 12          | 1                  | 13                 | 28 9/16         | 8 5/8         | 1 1/4        | 1 1/4   | 28 9/16                | 30 9/16  | 38 3/8   | 11 1/2  | 3 7/8 | 1              | 2 1/4    | 7 9/16  | 30 5/8              | 32 5/8   | 4      |        |
| 13          |                    | 14                 | 36 1/4          |               |              |         | 38 1/4                 | 46 1/16  | 38 5/16  |         |       |                | 40 5/16  |         |                     |          |        |        |
| 14          |                    |                    | 36 3/4          |               |              |         | 39 5/8                 | 47 5/16  | 38 13/16 |         |       |                | 40 13/16 |         |                     |          |        |        |
| 15          | 1 1/4              | 14                 | 36 5/8          | 8 5/8         | 1 3/8        | 1 1/4   | 36 5/8                 | 39 1/2   | 47 3/16  | 10 9/16 | 4     | 1 3/8          | 3        | 7 9/16  | 38 11/16            | 40 11/16 | 4      |        |
| 16          | 1 1/2              | 15                 | 44 1/16         |               | 1 15/16      | 1 15/16 | 44 1/16                | 47 1/16  | 54 5/8   | 11 1/16 |       |                | 4        | 3 1/2   | 7 1/16              | 46 1/8   |        | 48 1/8 |
| 17          | 1 3/4              |                    | 50 1/4          |               | 53 1/4       |         | 61 5/16                | 11 9/16  | 4        | 4       |       |                |          | 52 5/16 |                     | 54 5/16  |        |        |
| 18          | 2                  | 16                 | 49 7/8          | 12 3/4        | 2 3/4        | 2 3/4   | 49 7/8                 | 53 1/8   | 60 11/16 | 10 7/8  | 4     | 2 1/4          | 4 9/16   | 7       | 51 1/16             | 53 5/16  | 4      |        |
| 19          | 2 1/4              |                    | 55 7/8          |               |              |         | 60 3/8                 | 67 7/8   | 11 7/16  | 4       |       |                | 5        |         | 58 1/16             | 60 1/16  |        |        |
| 20          | 2 1/2              |                    | 65 5/8          |               |              |         | 70 1/8                 | 78 3/16  | 11 15/16 | 4       |       |                | 5 9/16   |         | 67 13/16            | 69 13/16 |        |        |
| 21          | 2 3/4              | 17                 | 73 5/16         | 12 3/4        | 3 5/8        | 3 5/8   | 73 5/16                | 76 13/16 | 87 7/8   | 11      | 4     | 2 3/4          | 6 1/4    | 9 5/16  | 75 7/16             | 77 7/16  | 4      |        |
| 22          | 3                  | 18                 | 91 1/2          |               |              |         | 91 1/2                 | 95 1/2   | 106 7/16 | 11 1/2  |       | 3              |          |         | 6 5/8               | 93 5/8   |        | 95 5/8 |

Attachment rods and nuts not furnished.

See page 150 for Type F roller and guided load column information.

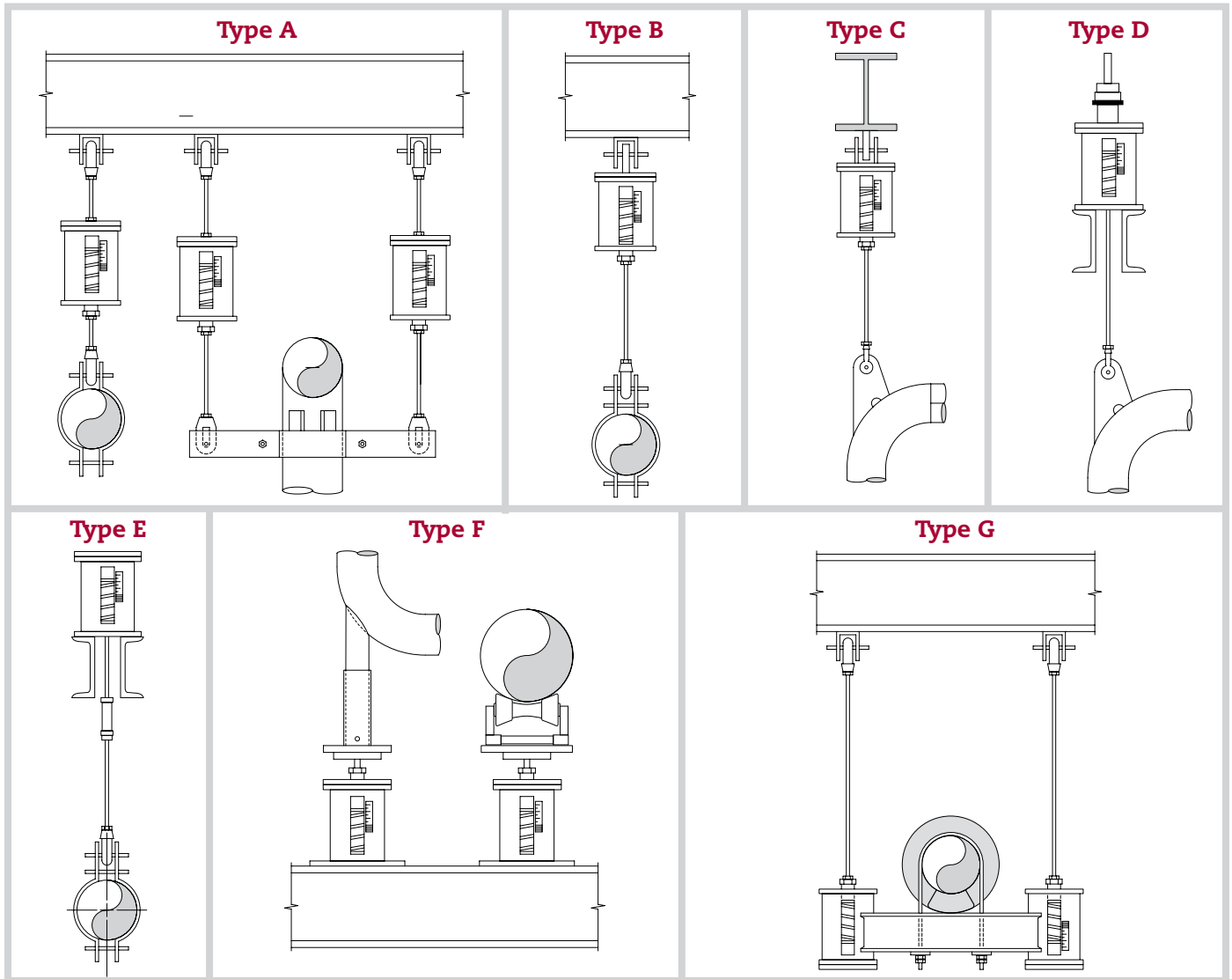
**See Fig. B-268 for dimensions not listed**

## Fig. 82, Fig. B-268, Fig. 98, Triple Spring, and Quadruple Spring (cont.) Fig. C-82, Fig. C-268, Fig. C-98, Triple-CR, and Quadruple-CR Spring (Corrosion Resistant)

**How to Determine Type:** The type of variable spring hanger to be used depends upon the physical characteristics required by the suspension problem (e.g., amount of head room, whether pipe is to be supported above or below the spring, etc.).

Consideration should be given to the seven standard types offered (see illustration below). Special variable spring hangers can be fabricated for unusual conditions.

### Spring Hanger Types – Typical Applications



**Recommended Service:** Pipe hangers located at points that are subject to vertical thermal movement and for which a constant support hanger is not required (see “recommended service” for constant support hanger, page 161). Type D & E spring hangers may accommodate less than 4° of rod swing depending on size, figure number, and application.

**Installation:** Securely attach hanger to the building. Attach lower hanger rod and turn the load coupling until the load indicator is positioned at the desired setting indicated on the load scale plate.

**Adjustment of Hanger:** Once installed in the line; the hanger should be adjusted until the load indicator moves to the white button marked “C” (cold position). On inspection of the system, after a reasonable period of operation, the load indicator should be at the red button marked “H” (hot position). If it is not, the hanger should be readjusted to the hot position. No other adjustment is necessary.

**How to Determine Series:** Complete sizing information is given on the hanger selection chart on pages 144 and 145. The sizing information is applicable to hangers of all series. As noted on the hanger selection charts that the total spring deflection in the casing leaves a reserve (overtravel) above and below the recommended working load range.

## Spring Hanger Size and Series Selection

**How to use hanger selection table:** In order to choose a proper size hanger, it is necessary to know the actual load which the spring is to support and the amount and direction of the pipe line movement from the cold to the hot position.

Find the actual load of the pipe in the load table. As it is desirable to support the actual weight of the pipe when the line is hot, the actual load is the hot load. To determine the cold load, read the spring scale, up or down, for the amount of expected movement.

The chart must be read opposite from the direction of the pipe's movement. The load arrived at is the cold load.

If the cold load falls outside of the working load range of the hanger selected, relocate the actual or hot load in the adjacent column and find the cold load. When the hot and cold loads are both within the working range of a hanger, the size number of that hanger will be found at the top of the column.

| <b>LOAD TABLE (LBS) FOR SELECTION OF HANGER SIZE</b> (sizes 10 through 22 on next page) |               |           |              |           |                             |           |                   |          |  |          |          |          |          |          |          |          |     |
|---|---------------|-----------|--------------|-----------|-----------------------------|-----------|-------------------|----------|--|----------|----------|----------|----------|----------|----------|----------|-----|
| <b>Working Range (in) unshaded</b><br><b>Shaded Rows Show Overtravel</b>                |               |           |              |           | <b>Hanger size</b>          |           |                   |          |  |          |          |          |          |          |          |          |     |
|   |               |           |              |           | <b>Figure No.</b>           |           | <b>B-268 Only</b> |          | <b>Fig. 82, Fig. B-268, Fig. 98, Triple &amp; Quadruple Spring</b> |          |          |          |          |          |          |          |     |
| <b>Quad.</b>  | <b>Triple</b> | <b>98</b> | <b>B-268</b> | <b>82</b> | <b>000</b>                  | <b>00</b> | <b>0</b>          | <b>1</b> | <b>2</b>   | <b>3</b> | <b>4</b> | <b>5</b> | <b>6</b> | <b>7</b> | <b>8</b> | <b>9</b> |     |
| <b>2</b>  | <b>1½</b>     | <b>1</b>  | <b>½</b>     | <b>¼</b>  | 7                           | 19        | 43                | 63       | 81   | 105      | 141      | 189      | 252      | 336      | 450      | 600      |     |
|   |               |           |              |           | 7                           | 20        | 44                | 66       | 84   | 109      | 147      | 197      | 263      | 350      | 469      | 625      |     |
|   |               |           |              |           | 8                           | 22        | 46                | 68       | 88   | 114      | 153      | 206      | 273      | 364      | 488      | 650      |     |
|   |               |           |              |           | 9                           | 24        | 48                | 71       | 91   | 118      | 159      | 213      | 284      | 378      | 506      | 675      |     |
| <b>0</b>  | <b>0</b>      | <b>0</b>  | <b>0</b>     | <b>0</b>  | 10                          | 26        | 50                | 74       | 95   | 123      | 165      | 221      | 294      | 392      | 525      | 700      |     |
|   |               |           |              |           | 11                          | 28        | 52                | 76       | 98   | 127      | 170      | 228      | 305      | 406      | 544      | 725      |     |
|   |               |           |              |           | 12                          | 30        | 54                | 79       | 101  | 131      | 176      | 236      | 315      | 420      | 563      | 750      |     |
|   |               |           |              |           | 12                          | 31        | 56                | 81       | 105  | 136      | 182      | 244      | 326      | 434      | 581      | 775      |     |
| <b>2</b>  | <b>1½</b>     | <b>1</b>  | <b>½</b>     | <b>¼</b>  | 14                          | 34        | 58                | 84       | 108  | 140      | 188      | 252      | 336      | 448      | 600      | 800      |     |
|   |               |           |              |           | 14                          | 35        | 59                | 87       | 111  | 144      | 194      | 260      | 347      | 462      | 619      | 825      |     |
|   |               |           |              |           | 15                          | 38        | 61                | 89       | 115  | 149      | 200      | 268      | 357      | 476      | 638      | 850      |     |
|   |               |           |              |           | 16                          | 40        | 63                | 92       | 118  | 153      | 206      | 276      | 368      | 490      | 656      | 875      |     |
| <b>4</b>  | <b>3</b>      | <b>2</b>  | <b>1</b>     | <b>½</b>  | 17                          | 41        | 65                | 95       | 122  | 158      | 212      | 284      | 378      | 504      | 675      | 900      |     |
|   |               |           |              |           | 18                          | 43        | 67                | 97       | 125  | 162      | 217      | 291      | 389      | 518      | 694      | 925      |     |
|   |               |           |              |           | 19                          | 45        | 69                | 100      | 128  | 166      | 223      | 299      | 399      | 532      | 713      | 950      |     |
|   |               |           |              |           | 20                          | 47        | 71                | 102      | 132  | 171      | 229      | 307      | 410      | 546      | 731      | 975      |     |
| <b>6</b>  | <b>4½</b>     | <b>3</b>  | <b>1½</b>    | <b>¾</b>  | 21                          | 49        | 73                | 105      | 135  | 175      | 235      | 315      | 420      | 560      | 750      | 1,000    |     |
|   |               |           |              |           | 21                          | 50        | 74                | 108      | 138  | 179      | 241      | 323      | 431      | 574      | 769      | 1,025    |     |
|   |               |           |              |           | 22                          | 53        | 76                | 110      | 142  | 184      | 247      | 331      | 441      | 588      | 788      | 1,050    |     |
|   |               |           |              |           | 23                          | 55        | 78                | 113      | 145  | 188      | 253      | 339      | 452      | 602      | 806      | 1,075    |     |
| <b>8</b>  | <b>6</b>      | <b>4</b>  | <b>2</b>     | <b>1</b>  | 24                          | 56        | 80                | 116      | 149  | 193      | 258      | 347      | 462      | 616      | 825      | 1,100    |     |
|   |               |           |              |           | 25                          | 58        | 82                | 118      | 152  | 197      | 264      | 354      | 473      | 630      | 844      | 1,125    |     |
|   |               |           |              |           | 26                          | 60        | 84                | 121      | 155  | 201      | 270      | 362      | 483      | 644      | 863      | 1,150    |     |
|   |               |           |              |           | 27                          | 62        | 86                | 123      | 159  | 206      | 276      | 370      | 494      | 658      | 881      | 1,175    |     |
| <b>10</b>   | <b>7½</b>     | <b>5</b>  | <b>2½</b>    | <b>1¼</b> | 28                          | 64        | 88                | 126      | 162  | 210      | 282      | 378      | 504      | 672      | 900      | 1,200    |     |
|   |               |           |              |           | 28                          | 66        | 89                | 129      | 165  | 214      | 288      | 386      | 515      | 686      | 919      | 1,225    |     |
|   |               |           |              |           | 29                          | 68        | 91                | 131      | 169  | 219      | 294      | 394      | 525      | 700      | 938      | 1,250    |     |
|   |               |           |              |           | 30                          | 70        | 93                | 134      | 172  | 223      | 300      | 402      | 536      | 714      | 956      | 1,275    |     |
| <b>2</b>  | <b>1½</b>     | <b>1</b>  | <b>½</b>     | <b>¼</b>  | 31                          | 72        | 95                | 137      | 176  | 228      | 306      | 410      | 546      | 728      | 975      | 1,300    |     |
|   |               |           |              |           | <b>Spring Rate (lbs/in)</b> |           |                   |          |  |          |          |          |          |          |          |          |     |
|   |               |           |              |           | <b>82</b>                   | -         | -                 | 30       | 42   | 54       | 70       | 94       | 126      | 168      | 224      | 300      | 400 |
|   |               |           |              |           | <b>B-268</b>                | 7         | 15                | 15       | 21   | 27       | 35       | 47       | 63       | 84       | 112      | 150      | 200 |
| <b>98</b>   | -             | -         | 7            | 10        | 13                          | 17        | 23                | 31       | 42   | 56       | 75       | 100      |          |          |          |          |     |
| <b>Triple</b>   | -             | -         | 5            | 7         | 9                           | 12        | 16                | 21       | 28   | 37       | 50       | 67       |          |          |          |          |     |
| <b>Quadruple</b>  | -             | -         | 4            | 5         | 7                           | 9         | 12                | 16       | 21   | 28       | 38       | 50       |          |          |          |          |     |

**Note:** General rule for series selection use Fig. 82 for up to ½" of movement up to 1" use Fig. B-268, up to 2" use Fig. 98, up to 3" use a Triple, up to 4" use a Quadruple. Double check to assure desired variability is achieved.

## Spring Hanger Size and Series Selection

**How to use hanger selection table (cont.):** Should it be impossible to select a hanger in a particular series such that both loads occur within the working range, consideration should be given to a variable spring hanger with a wider working range or a constant support hanger. The cold load is calculated by adding (for up movement) or subtracting (for down movement) the product of spring rate times movement to or from the hot load.

**Cold load = (hot load) ± (movement) x (spring rate)**

A key criteria in selecting the size and series of a variable spring is a factor known as variability. This is a measurement of the percentage change in supporting force between the hot and cold positions of a spring and is calculated from the formula:

**Variability = (Movement) x (Spring Rate) / (Hot Load)**

If an allowable variability is not specified, good practice would be to use 25% as recommended by MSS-SP-58.

| LOAD TABLE (LBS) FOR SELECTION OF HANGER SIZE (Continued from previous page) |       |       |       |       |       |       |        |        |        |        |        |                             |           |       |                             |        |       |
|--|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|-----------------------------|-----------|-------|-----------------------------|--------|-------|
| Hanger size  |       |       |       |       |       |       |        |        |        |        |        | Working Range (in) unshaded |           |       | Shaded Rows Show Overtravel |        |       |
| Fig. 82, Fig. B-268, Fig. 98, Triple & Quadruple Spring                      |       |       |       |       |       |       |        |        |        |        |        | Figure No.                  |           |       |                             |        |       |
| 10   | 11    | 12    | 13    | 14    | 15    | 16    | 17     | 18     | 19     | 20     | 21     | 22                          | 82        | B-268 | 98                          | Triple | Quad. |
| 780  | 1,020 | 1,350 | 1,800 | 2,400 | 3,240 | 4,500 | 6,000  | 7,990  | 10,610 | 14,100 | 18,750 | 25,005                      |           |       |                             |        |       |
| 813  | 1,063 | 1,406 | 1,875 | 2,500 | 3,375 | 4,688 | 6,250  | 8,322  | 11,053 | 14,588 | 19,531 | 26,047                      | ¼         | ½     | 1                           | 1½     | 2     |
| 845  | 1,105 | 1,463 | 1,950 | 2,600 | 3,510 | 4,875 | 6,500  | 8,655  | 11,495 | 15,275 | 20,313 | 27,089                      |           |       |                             |        |       |
| 878  | 1,148 | 1,519 | 2,025 | 2,700 | 3,645 | 5,063 | 6,750  | 8,987  | 11,938 | 15,863 | 21,094 | 28,131                      |           |       |                             |        |       |
| 910  | 1,190 | 1,575 | 2,100 | 2,800 | 3,780 | 5,250 | 7,000  | 9,320  | 12,380 | 16,450 | 21,875 | 29,173                      | 0         | 0     | 0                           | 0      | 0     |
| 943  | 1,233 | 1,631 | 2,175 | 2,900 | 3,915 | 5,438 | 7,250  | 9,652  | 12,823 | 17,038 | 22,656 | 30,215                      |           |       |                             |        |       |
| 975  | 1,275 | 1,688 | 2,250 | 3,000 | 4,050 | 5,625 | 7,500  | 9,985  | 13,265 | 17,625 | 23,438 | 31,256                      |           |       |                             |        |       |
| 1,008  | 1,318 | 1,744 | 2,325 | 3,100 | 4,185 | 5,813 | 7,750  | 10,317 | 13,708 | 18,213 | 24,219 | 32,298                      |           |       |                             |        |       |
| 1,040  | 1,360 | 1,800 | 2,400 | 3,200 | 4,320 | 6,000 | 8,000  | 10,650 | 14,150 | 18,800 | 25,000 | 33,340                      | ¼         | ½     | 1                           | 1½     | 2     |
| 1,073  | 1,403 | 1,856 | 2,475 | 3,300 | 4,455 | 6,188 | 8,250  | 10,982 | 14,592 | 19,388 | 25,781 | 34,382                      |           |       |                             |        |       |
| 1,105  | 1,445 | 1,913 | 2,550 | 3,400 | 4,590 | 6,375 | 8,500  | 11,315 | 15,035 | 19,975 | 26,563 | 35,424                      |           |       |                             |        |       |
| 1,138  | 1,488 | 1,969 | 2,625 | 3,500 | 4,725 | 6,563 | 8,750  | 11,647 | 15,477 | 20,563 | 27,344 | 36,466                      |           |       |                             |        |       |
| 1,170  | 1,530 | 2,025 | 2,700 | 3,600 | 4,860 | 6,750 | 9,000  | 11,980 | 15,920 | 21,150 | 28,125 | 37,508                      | ½         | 1     | 2                           | 3      | 4     |
| 1,203  | 1,573 | 2,081 | 2,775 | 3,700 | 4,995 | 6,938 | 9,250  | 12,312 | 16,362 | 21,738 | 28,906 | 38,549                      |           |       |                             |        |       |
| 1,235  | 1,615 | 2,138 | 2,850 | 3,800 | 5,130 | 7,125 | 9,500  | 12,645 | 16,805 | 22,325 | 29,688 | 39,591                      |           |       |                             |        |       |
| 1,268  | 1,658 | 2,194 | 2,925 | 3,900 | 5,265 | 7,313 | 9,750  | 12,977 | 17,247 | 22,913 | 30,469 | 40,633                      |           |       |                             |        |       |
| 1,300  | 1,700 | 2,250 | 3,000 | 4,000 | 5,400 | 7,500 | 10,000 | 13,310 | 17,690 | 23,500 | 31,250 | 41,675                      | ¾         | 1½    | 3                           | 4½     | 6     |
| 1,333  | 1,743 | 2,306 | 3,075 | 4,100 | 5,535 | 7,688 | 10,250 | 13,642 | 18,132 | 24,088 | 32,031 | 42,717                      |           |       |                             |        |       |
| 1,365  | 1,785 | 2,363 | 3,150 | 4,200 | 5,670 | 7,875 | 10,500 | 13,975 | 18,575 | 24,675 | 32,813 | 43,759                      |           |       |                             |        |       |
| 1,398  | 1,828 | 2,419 | 3,225 | 4,300 | 5,805 | 8,063 | 10,750 | 14,307 | 19,017 | 25,263 | 33,594 | 44,801                      |           |       |                             |        |       |
| 1,430  | 1,870 | 2,475 | 3,300 | 4,400 | 5,940 | 8,250 | 11,000 | 14,640 | 19,460 | 25,850 | 34,375 | 45,843                      | 1         | 2     | 4                           | 6      | 8     |
| 1,463  | 1,913 | 2,531 | 3,375 | 4,500 | 6,075 | 8,438 | 11,250 | 14,972 | 19,902 | 26,438 | 35,156 | 46,885                      |           |       |                             |        |       |
| 1,495  | 1,955 | 2,588 | 3,450 | 4,600 | 6,210 | 8,625 | 11,500 | 15,305 | 20,345 | 27,025 | 35,938 | 47,926                      |           |       |                             |        |       |
| 1,528  | 1,998 | 2,644 | 3,525 | 4,700 | 6,345 | 8,813 | 11,750 | 15,637 | 20,787 | 27,613 | 36,719 | 48,968                      |           |       |                             |        |       |
| 1,560  | 2,040 | 2,700 | 3,600 | 4,800 | 6,480 | 9,000 | 12,000 | 15,970 | 21,230 | 28,200 | 37,500 | 50,010                      | 1¼        | 2½    | 5                           | 7½     | 10    |
| 1,593  | 2,083 | 2,756 | 3,675 | 4,900 | 6,615 | 9,188 | 12,250 | 16,302 | 21,672 | 28,788 | 38,281 | 51,052                      |           |       |                             |        |       |
| 1,625  | 2,125 | 2,813 | 3,750 | 5,000 | 6,750 | 9,375 | 12,500 | 16,635 | 22,115 | 29,375 | 39,063 | 52,094                      | ¼         | ½     | 1                           | 1½     | 2     |
| 1,658  | 2,168 | 2,869 | 3,825 | 5,100 | 6,885 | 9,563 | 12,750 | 16,967 | 22,557 | 29,963 | 39,844 | 53,136                      |           |       |                             |        |       |
| 1,690  | 2,210 | 2,925 | 3,900 | 5,200 | 7,020 | 9,750 | 13,000 | 17,300 | 23,000 | 30,550 | 40,625 | 54,178                      |           |       |                             |        |       |
| Spring Rate (lbs/in)   |       |       |       |       |       |       |        |        |        |        |        |                             |           |       |                             |        |       |
| 520  | 680   | 900   | 1,200 | 1,600 | 2,160 | 3,000 | 4,000  | 5,320  | 7,080  | 9,400  | 12,500 | 16,670                      | 82        |       |                             |        |       |
| 260  | 340   | 450   | 600   | 800   | 1,080 | 1,500 | 2,000  | 2,660  | 3,540  | 4,700  | 6,250  | 8,335                       | B-268     |       |                             |        |       |
| 130  | 170   | 225   | 300   | 400   | 540   | 750   | 1,000  | 1,330  | 1,770  | 2,350  | 3,125  | 4,167                       | 98        |       |                             |        |       |
| 87   | 113   | 150   | 200   | 267   | 360   | 500   | 667    | 887    | 1,180  | 1,567  | 2,083  | 2,778                       | Triple    |       |                             |        |       |
| 65   | 85    | 113   | 150   | 200   | 270   | 375   | 500    | 665    | 885    | 1,175  | 1,563  | 2,084                       | Quadruple |       |                             |        |       |

**Note:** General rule for series selection use Fig. 82 for up to ½" of movement up to 1" use Fig. B-268, up to 2" use Fig. 98, up to 3" use a Triple, up to 4" use a Quadruple. Double check to assure desired variability is achieved.