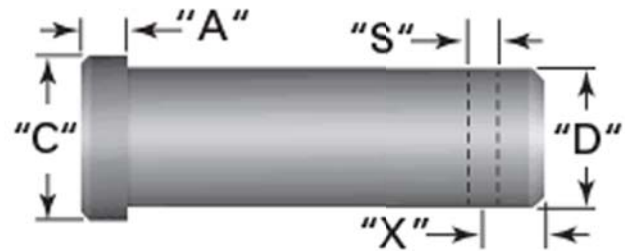
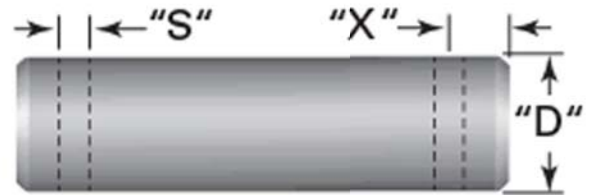


# Clevis Pins

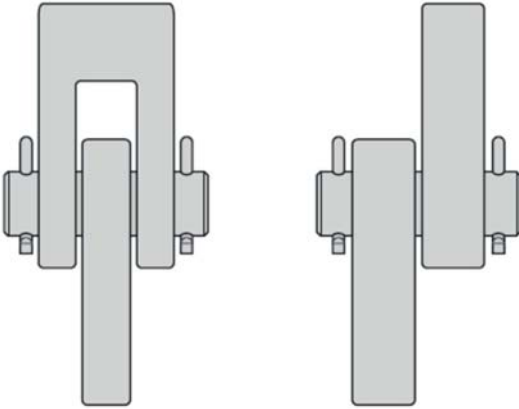


|                 |          | HEAD PINS ONLY   |                       |             |                         |                            |
|-----------------|----------|------------------|-----------------------|-------------|-------------------------|----------------------------|
| PIN DIA.<br>"D" | PART NO. | HEAD DIA.<br>"C" | HEAD THICKNESS<br>"A" | COTTER SIZE | COTTER HOLE DIA.<br>"S" | COTTER HOLE SETBACK<br>"X" |
| 1/2"            | 27P16S   | 5/8"             | 5/32"                 | 1/8"        | 5/32"                   | 5/32"                      |
| 5/8"            | 27P20S   | 13/16"           | 13/64"                | 1/8"        | 5/32"                   | 5/32"                      |
| 3/4"            | 27P24S   | 15/16"           | 1/4"                  | 1/8"        | 5/32"                   | 3/8"                       |
| 7/8"            | 27P28S   | 1 1/32"          | 5/16"                 | 1/8"        | 5/32"                   | 3/8"                       |
| 1"              | 27P32S   | 1 3/16"          | 11/32"                | 1/8"        | 5/32"                   | 3/8"                       |
| 1 1/8"          | 27P36S   | 1 1/2"           | 3/8"                  | 1/4"        | 5/16"                   | 1/2"                       |
| 1 1/4"          | 27P40S   | 1 1/2"           | 3/8"                  | 1/4"        | 5/16"                   | 1/2"                       |
| 1 3/8"          | 27P44S   | 1 3/4"           | 3/8"                  | 1/4"        | 5/16"                   | 1/2"                       |
| 1 1/2"          | 27P48S   | 1 3/4"           | 3/8"                  | 1/4"        | 5/16"                   | 1/2"                       |
| 1 5/8"          | 27P52S   | 2"               | 3/8"                  | 1/4"        | 5/16"                   | 1/2"                       |
| 1 3/4"          | 27P56S   | 2"               | 3/8"                  | 1/4"        | 5/16"                   | 1/2"                       |
| 1 7/8"          | 27P60S   | 2 1/4"           | 3/8"                  | 1/4"        | 5/16"                   | 1/2"                       |
| 2"              | 27P64S   | 2 3/8"           | 3/8"                  | 1/4"        | 5/16"                   | 1/2"                       |
| 2 1/4"          | 27P72S   | 2 5/8"           | 3/8"                  | 3/8"        | 13/32"                  | 1/2"                       |
| 2 1/2"          | 27P80S   | 2 7/8"           | 3/8"                  | 3/8"        | 13/32"                  | 1/2"                       |
| 2 3/4"          | 27P88S   | 3 1/8"           | 3/8"                  | 3/8"        | 13/32"                  | 1/2"                       |
| 3"              | 27P96S   | 3 1/2"           | 1/2"                  | 1/2"        | 17/32"                  | 1"                         |
| 3 1/4"          | 27P104S  | 3 3/4"           | 1/2"                  | 1/2"        | 17/32"                  | 1"                         |
| 3 1/2"          | 27P112S  | 4"               | 1/2"                  | 1/2"        | 17/32"                  | 1"                         |
| 3 3/4"          | 27P120S  | 4 1/4"           | 1/2"                  | 1/2"        | 17/32"                  | 1"                         |
| 4"              | 27P128S  | 4 1/2"           | 1/2"                  | 1/2"        | 17/32"                  | 1"                         |
| 4 1/2"          | 27P144S  | 5"               | 1/2"                  | 1/2"        | 17/32"                  | 1"                         |
| 5"              | 27P160S  | 5 1/2"           | 1/2"                  | 1/2"        | 17/32"                  | 1"                         |

# Specifying Clevis Pins

## APPLICATIONS

Pin connections are a cost effective method of connecting two structural members which are subjected to simple tension loads. They make possible straightforward and rapid field installation of bracing and support members. Because pin connections normally do not clamp the connected members, they are generally only recommended for use in connections where they are loaded in double shear.



Double shear and single shear connections

## RELEVANT STANDARDS

The American Institute of Steel Construction (AISC) Manual of Steel Construction, 9th edition defines basic dimensions for both headed and straight clevis pins used in structural applications. The AISC manual identifies headed pins as 'vertical pins' and straight pins as 'horizontal' pins, implying that headed pins should be used in applications where the long axis of the pin is oriented vertically. In these applications, a straight pin could fall out of the connection if the cotter pin was improperly installed or failed due to corrosion.

ANSI/ASME B18.8.1 defines dimensions and tolerances for small cold formed clevis pins for use in machines and linkages. This specification covers sizes from  $\frac{3}{16}$ " through 1" diameter.

## MATERIALS

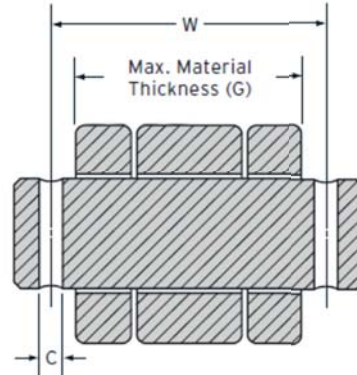
Smaller headed pins are produced from cold headed low carbon steel wire. Straight pins and larger headed pins ( $\frac{1}{4}$ " diameter and up) are machined from ASTM A108 Grade 1117 bar stock. Other available materials for machined pins include 1045, 4140, A36, A572/A588, A193 Grade B7, A668 and various stainless grades.

## FINISHES

Smaller headed and straight pins are normally supplied with a plain, cold drawn mill finish. Larger pins which are made from hot rolled or forged bars are machined to produce an ANSI 125 finish on the bearing diameter. Hot dip galvanized and zinc electroplating coatings are available for corrosion protection.

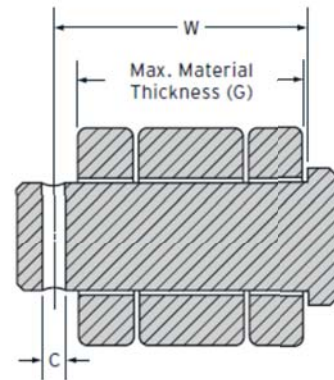
## DIMENSIONS

Refer to the table for basic dimensions of standard clevis pins. An additional dimension, 'W' is determined as shown below and is normally specified in  $\frac{1}{4}$ " increments. Assembly environment, coatings and thickness tolerances should all be considered when determining the fit-up allowance. The minimum recommended value is  $\frac{1}{4}$ ".



$$W = G + C + \text{FIT-UP ALLOWANCE}$$

Cotter hole spacing for straight pins



$$W = G + C/2 + \text{FIT-UP ALLOWANCE}$$

Cotter hole spacing for headed pins

## COTTER PINS

Headed and straight pins are normally supplied with extended prong steel cotter pins with a zinc plated finish. Other cotter pin styles and materials are available.

## OTHER OPTIONS

Headed pins are occasionally specified with a shouldered, threaded end and a mating nut. Plate washers or recess nuts can be used in conjunction with these designs to provide grip adjustment. Metric sizes and other variations from the standard dimensions are also available.