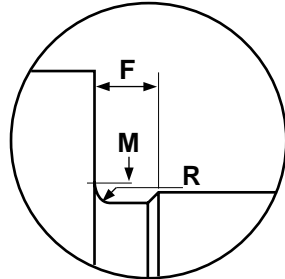


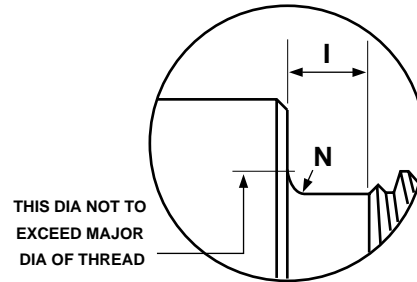
‡Length of a socket shoulder screw is measured from the underhead bearing surface to the plane of the shoulder at the threaded end.

| SOCKET HEAD SHOULDER SCREWS - ALLOY STEEL |                   |        |               |       |             |       |                   |                 |                |                            | ASME B18.3-1988    |                        |                     |
|---|-------------------|--------|---------------|-------|-------------|-------|-------------------|-----------------|----------------|----------------------------|--------------------|------------------------|---------------------|
| Nominal Size                              | D                 |        | A             |       | H           |       | C                 | J               | T              | M                          | R                  | K                      | F                   |
|   | Shoulder Diameter |        | Head Diameter |       | Head Height |       | Chamfer or Radius | Hex Socket Size | Key Engagement | Fillet Transition Diameter | Head Fillet Radius | Shoulder Neck Diameter | Shoulder Neck Width |
|   | Max               | Min    | Max           | Min   | Max         | Min   | Min               | Nom             | Min            | Max                        | Min                | Min                    | Max                 |
| 1/4                                       | 0.2480            | 0.2460 | 0.375         | 0.357 | 0.188       | 0.177 | 0.020             | 1/8             | 0.094          | 0.276                      | 0.009              | 0.227                  | 0.093               |
| 5/16                                      | 0.3105            | 0.3085 | 0.438         | 0.419 | 0.219       | 0.209 | 0.026             | 5/32            | 0.117          | 0.345                      | 0.012              | 0.289                  | 0.093               |
| 3/8                                       | 0.3730            | 0.3710 | 0.562         | 0.543 | 0.250       | 0.240 | 0.031             | 3/16            | 0.141          | 0.413                      | 0.015              | 0.352                  | 0.093               |
| 1/2                                       | 0.4980            | 0.4960 | 0.750         | 0.729 | 0.312       | 0.302 | 0.040             | 1/4             | 0.188          | 0.550                      | 0.020              | 0.477                  | 0.093               |
| 5/8                                       | 0.6230            | 0.6210 | 0.875         | 0.853 | 0.375       | 0.365 | 0.050             | 5/16            | 0.234          | 0.687                      | 0.024              | 0.602                  | 0.093               |
| 3/4                                       | 0.7480            | 0.7460 | 1.000         | 0.977 | 0.500       | 0.490 | 0.069             | 3/8             | 0.281          | 0.826                      | 0.030              | 0.727                  | 0.093               |

|                                 |   |
|---------------------------------|---|
| <b>Description</b>              | A hex socket head screw with an enlarged, unthreaded, cylindrical shoulder under the head, the diameter of which serves as the basis for the derivation of the nominal size.  |
| <b>Applications/ Advantages</b> | For rotation or sliding applications, such as pulley shafts, in punch and die work, or for use as a bearing pin. Shoulder screws are also referred to as "stripper bolts".  |
| <b>Material</b>                 | Shoulder screws shall be made fabricated from an alloy steel having one or more of the following elements: chromium, nickel, molybdenum or vanadium, in sufficient quantity to assure the hardness specified below. |
| <b>Heat Treatment</b>           | Shoulder screws shall be heat-treated by oil quenching from above the transformation temperature and then tempered at a temperature not lower than 650°F.   |
| <b>Hardness</b>                 | Rockwell C32 - 43   |
| <b>Tensile Strength</b>         | 140,000 psi. minimum (material only)  |
| <b>Yield Strength</b>           | 120,000 psi. minimum (material only)  |
| <b>Elongation</b>               | 15% minimum (applies to all machined specimens of length at least 4D where D equals the nominal diameter of the screw)  |
| <b>Reduction of Area</b>        | 45% minimum (applies to all machined specimens)   |
| <b>Plating</b>                  | Shoulder screws are usually supplied with a plain finish.   |



**ENLARGED DETAIL Y**



**ENLARGED DETAIL Z**

| SOCKET HEAD SHOULDER SCREWS - ALLOY STEEL (CONTINUED) |                     |                  |                          |       |                   |                    |       |               |                                       |                             | ASME B18.3-1998,<br>Blue Devil® |                           |
|---|---------------------|------------------|--------------------------|-------|-------------------|--------------------|-------|---------------|---------------------------------------|-----------------------------|---------------------------------|---------------------------|
| Nominal Size  | D1                  | Threads Per Inch | G                        |       | I                 | N                  |       | E             | Thread Section Tensile Strength (Lbs) | Single Shear Strength (Lbs) |                                 | Seating Torque (Inch Lbs) |
|   | Nominal Thread Size |                  | Thread Neck Diameter     |       | Thread Neck Width | Thread Neck Fillet |       | Thread Length |                                       | Shoulder                    | Thread Neck                     |                           |
|   |                     |                  | Max                      | Min   |                   | Max                | Min   |               |                                       | Basic                       | Min                             |                           |
| 1/4   | 10                  | 24               | 0.142                    | 0.133 | 0.083             | 0.023              | 0.017 | 0.375         | 2,540                                 | 4,515                       | 1,250                           | 50                        |
| 5/16  | 1/4                 | 20               | 0.193                    | 0.182 | 0.100             | 0.028              | 0.022 | 0.438         | 4,610                                 | 7,100                       | 2,340                           | 125                       |
| 3/8   | 5/16                | 18               | 0.249                    | 0.237 | 0.111             | 0.031              | 0.025 | 0.500         | 7,600                                 | 10,280                      | 3,970                           | 265                       |
| 1/2   | 3/8                 | 16               | 0.304                    | 0.291 | 0.125             | 0.035              | 0.029 | 0.625         | 11,240                                | 18,350                      | 5,985                           | 470                       |
| 5/8   | 1/2                 | 13               | 0.414                    | 0.397 | 0.154             | 0.042              | 0.036 | 0.750         | 20,570                                | 28,785                      | 11,140                          | 1,150                     |
| 3/4   | 5/8                 | 11               | 0.521                    | 0.502 | 0.182             | 0.051              | 0.045 | 0.875         | 32,770                                | 41,515                      | 17,800                          | 2,000                     |
| <b>Nominal Screw Sizes</b>                            |                     |                  |                          |       |                   |                    |       |               |                                       |                             |                                 |                           |
| <b>Tolerance on Thread Length</b>                     |                     |                  | Up to 3/8 in., Inclusive |       |                   |                    |       |               | Over 3/8 in.                          |                             |                                 |                           |
|   |                     |                  | -0.020                   |       |                   |                    |       |               | -0.030                                |                             |                                 |                           |