

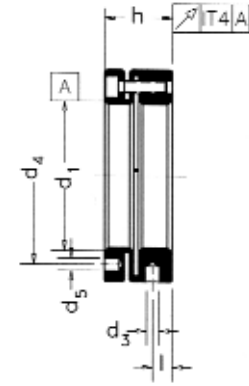
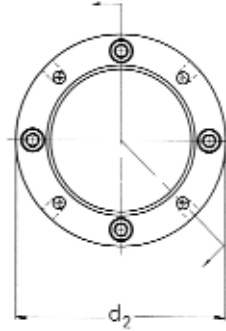
# SPIETH Adjustable Locknuts Series MSR - Inch

Fig. 12

Designation of a locknut with  
 $d_1 = 17\text{mm} \times 32 \text{ threads/in.}$   
 Locknut MSR 17 x 32  
 $d_1 = 5/8" \times 18 \text{ threads/in.}$   
 Locknut MSR 5/8" x 18

The allowable axial loads specified in the table are guideline values calculated with a safety margin of 1.6

- under static load, based on the minimum yield point,
- under dynamic loads, based on the minimum fatigue strength.



| MSR<br>(d <sub>1</sub> x thread)<br>in | Equivalent<br>bearing<br>nut | Dimensions in inches |                              |                |                              |     |      | Clamp screws |     |                | Calculation<br>factor | Locknut-<br>specific<br>allowance<br>B | Allowable<br>axial load |       | Mass moment<br>of inertia |
|----------------------------------------|------------------------------|----------------------|------------------------------|----------------|------------------------------|-----|------|--------------|-----|----------------|-----------------------|----------------------------------------|-------------------------|-------|---------------------------|
|                                        |                              | d <sub>2</sub>       | d <sub>3</sub> <sup>1)</sup> | d <sub>4</sub> | d <sub>5</sub> <sup>1)</sup> | l   | h    | Sizes        | n   | T <sub>s</sub> |                       |                                        | dyn.                    | stat. |                           |
|                                        |                              |                      |                              |                |                              |     |      | SHCS         | Qty | in lbs         | A                     | N                                      | kN                      | kN    | J                         |
| ANSF class 3                           |                              |                      |                              |                |                              |     |      |              |     |                | mm                    | N                                      | kN                      | kN    | kg cm <sup>2</sup>        |
| 17 x 32                                | N-03                         | 1.38                 | .158                         | 1.00           | .169                         | .19 | .70  | M 4x12       | 4   | 25             | 1.092                 | 3947                                   | 19                      | 25    | 0.147                     |
| 20 x 32                                | N-04                         | 1.57                 | .158                         | 1.12           | .169                         | .19 | .70  | M 4x12       | 4   | 25             | 1.270                 | 3900                                   | 22                      | 29    | 0.283                     |
| 25 x 32                                | N-05                         | 1.77                 | .197                         | 1.36           | .169                         | .25 | .78  | M 4x12       | 4   | 25             | 1.524                 | 3822                                   | 33                      | 47    | 0.488                     |
| 30 x 18                                | N-06                         | 1.89                 | .197                         | 1.52           | .169                         | .25 | .78  | M 4x12       | 4   | 25             | 1.905                 | 3744                                   | 38                      | 57    | 0.588                     |
| 35 x 18                                | N-07                         | 2.09                 | .197                         | 1.71           | .169                         | .27 | .86  | M 4x16       | 4   | 25             | 2.210                 | 3666                                   | 47                      | 66    | 0.914                     |
| 40 x 18                                | N-08                         | 2.28                 | .197                         | 1.91           | .169                         | .27 | .86  | M 4x16       | 4   | 25             | 2.464                 | 3588                                   | 49                      | 66    | 1.254                     |
| 45 x 18                                | N-09                         | 2.68                 | .236                         | 2.17           | .169                         | .25 | .86  | M 4x16       | 6   | 25             | 2.769                 | 5265                                   | 53                      | 84    | 2.494                     |
| 50 x 18                                | N-10                         | 2.76                 | .236                         | 2.30           | .169                         | .35 | .98  | M 4x18       | 6   | 25             | 3.073                 | 5148                                   | 71                      | 94    | 2.909                     |
| 55 x 18                                | N-11                         | 2.95                 | .236                         | 2.50           | .169                         | .35 | .98  | M 4x18       | 6   | 25             | 3.353                 | 5031                                   | 72                      | 96    | 3.690                     |
| 60 x 18                                | N-12                         | 3.31                 | .236                         | 2.78           | .209                         | .35 | 1.02 | M 5x18       | 6   | 40             | 3.632                 | 8001                                   | 123                     | 163   | 6.317                     |
| 65 x 18                                | N-13                         | 3.50                 | .236                         | 2.97           | .209                         | .41 | 1.10 | M5x20        | 6   | 40             | 3.912                 | 7811                                   | 134                     | 177   | 7.708                     |
| 70 x 18                                | N-14                         | 3.74                 | .315                         | 3.19           | .209                         | .37 | 1.10 | M5x20        | 6   | 40             | 4.217                 | 7620                                   | 153                     | 203   | 10.500                    |
| 75 x 12                                | AN-15                        | 3.94                 | .315                         | 3.43           | .252                         | .34 | 1.10 | M 6x20       | 6   | 75             | 4.572                 | 10530                                  | 121                     | 160   | 12.346                    |
| 80 x 12                                | AN-16                        | 4.33                 | .315                         | 3.62           | .252                         | .43 | 1.26 | M 6x22       | 6   | 75             | 4.877                 | 10260                                  | 194                     | 258   | 22.033                    |
| 85 x 12                                | AN-17                        | 4.53                 | .315                         | 3.82           | .252                         | .43 | 1.26 | M 6x22       | 6   | 75             | 5.182                 | 9990                                   | 198                     | 262   | 25.660                    |
| 90 x 12                                | AN-18                        | 4.72                 | .315                         | 4.06           | .252                         | .43 | 1.26 | M 6x22       | 6   | 75             | 5.436                 | 9720                                   | 200                     | 265   | 29.615                    |
| 95 x 12                                | AN-19                        | 4.92                 | .315                         | 4.25           | .252                         | .43 | 1.26 | M 6x22       | 6   | 75             | 5.741                 | 9450                                   | 203                     | 268   | 34.017                    |
| 100 x 12                               | AN-20                        | 5.12                 | .315                         | 4.45           | .252                         | .43 | 1.26 | M 6x22       | 6   | 75             | 6.020                 | 9180                                   | 205                     | 271   | 38.838                    |
| 105 x 12                               | AN-21                        | 5.31                 | .315                         | 4.65           | .252                         | .43 | 1.26 | M 6x22       | 6   | 75             | 6.325                 | 8910                                   | 207                     | 274   | 44.097                    |
| 110 x 12                               | AN-22                        | 5.51                 | .315                         | 4.84           | .252                         | .43 | 1.26 | M 6x22       | 6   | 75             | 6.604                 | 8370                                   | 248                     | 239   | 64.164                    |
| 120 x 12                               | AN-24                        | 6.10                 | .315                         | 5.32           | .252                         | .51 | 1.41 | M 6x25       | 6   | 75             | 7.188                 | 8100                                   | 308                     | 408   | 89.668                    |
| 130 x 12                               | AN-26                        | 6.50                 | .315                         | 5.71           | .252                         | .51 | 1.41 | M 6x25       | 6   | 75             | 7.772                 | 7560                                   | 306                     | 405   | 110.500                   |
| 140 x 12                               | AN-28                        | 7.09                 | .394                         | 6.10           | .252                         | .47 | 1.41 | M 6x25       | 8   | 75             | 8.331                 | 9360                                   | 359                     | 476   | 160.977                   |
| 150 x 12                               | AN-30                        | 7.50                 | .394                         | 6.50           | .252                         | .47 | 1.41 | M 6x25       | 8   | 75             | 8.915                 | 8640                                   | 369                     | 489   | 197.954                   |
| 160 x 8                                | AN-32                        | 8.07                 | .394                         | 7.08           | .331                         | .55 | 1.57 | M 8x30       | 8   | 155            | 9.652                 | 14520                                  | 417                     | 552   | 301.314                   |
| 170 x 8                                | AN-34                        | 8.50                 | .394                         | 7.40           | .331                         | .55 | 1.57 | M 8x30       | 8   | 155            | 10.185                | 13200                                  | 423                     | 560   | 353.347                   |
| 180 x 8                                | AN-36                        | 9.06                 | .394                         | 8.87           | .331                         | .55 | 1.57 | M 8x30       | 8   | 155            | 10.770                | 11880                                  | 489                     | 648   | 477.504                   |
| 190 x 8                                | AN-38                        | 9.45                 | .394                         | 8.27           | .331                         | .55 | 1.57 | M 8x30       | 8   | 155            | 11.405                | 10560                                  | 495                     | 656   | 550.330                   |
| 200 x 8                                | AN-40                        | 9.65                 | .394                         | 8.58           | .331                         | .55 | 1.57 | M 8x30       | 8   | 155            | 11.938                | 9240                                   | 436                     | 578   | 544.727                   |
| AMERICAN STANDARD CLASS 3 FIT          |                              |                      |                              |                |                              |     |      |              |     |                |                       |                                        |                         |       |                           |
| 5/8" x 18                              | —                            | 1.38                 | .187                         | .96            | .187                         | .19 | .70  | 8-32 x .50   | 4   | 25             | 1.092                 | 3962                                   | 19                      | 25    | 0.147                     |
| 3/4" x 16                              | —                            | 1.56                 | .187                         | 1.12           | .187                         | .19 | .70  | 8-32 x .50   | 4   | 25             | 1.295                 | 3916                                   | 22                      | 29    | 0.283                     |
| 7/8" x 14                              | —                            | 1.56                 | .187                         | 1.20           | .187                         | .19 | .70  | 8-32 x .50   | 4   | 25             | 1.524                 | 3869                                   | 23                      | 32    | 0.270                     |
| 1" x 12                                | —                            | 1.75                 | .187                         | 1.36           | .187                         | .25 | .78  | 8-32 x .50   | 4   | 25             | 1.702                 | 3822                                   | 33                      | 47    | 0.488                     |
| 1-1/8" x 12                            | —                            | 1.88                 | .187                         | 1.44           | .187                         | .25 | .78  | 8-32 x .50   | 4   | 25             | 1.905                 | 3775                                   | 36                      | 53    | 0.504                     |
| 1-1/4" x 12                            | —                            | 2.00                 | .201                         | 1.60           | .187                         | .27 | .86  | 8-32 x .50   | 4   | 25             | 2.108                 | 3713                                   | 44                      | 64    | 0.743                     |
| 1-3/8" x 12                            | —                            | 2.12                 | .201                         | 1.71           | .187                         | .27 | .86  | 8-32 x .63   | 4   | 25             | 2.286                 | 3666                                   | 47                      | 66    | 0.914                     |
| 1-1/2" x 12                            | —                            | 2.25                 | .201                         | 1.83           | .187                         | .27 | .86  | 8-32 x .63   | 4   | 25             | 2.464                 | 3620                                   | 50                      | 75    | 1.337                     |
| 1-5/8" x 12                            | —                            | 2.38                 | .201                         | 1.98           | .187                         | .27 | .86  | 8-32 x .63   | 4   | 25             | 2.642                 | 3572                                   | 49                      | 66    | 1.254                     |
| 1-3/4" x 12                            | —                            | 2.69                 | .201                         | 2.17           | .187                         | .25 | .86  | 8-32 x .63   | 6   | 25             | 2.820                 | 5265                                   | 53                      | 84    | 2.494                     |
| 1-7/8" x 12                            | —                            | 2.69                 | .250                         | 2.23           | .187                         | .26 | .86  | 8-32 x .63   | 6   | 25             | 3.023                 | 5195                                   | 70                      | 94    | 2.631                     |
| 2" x 12                                | —                            | 2.75                 | .250                         | 2.34           | .187                         | .35 | .98  | 8-32 x .75   | 6   | 25             | 3.200                 | 5125                                   | 72                      | 96    | 2.909                     |
| 2-1/4" x 12                            | —                            | 3.00                 | .250                         | 2.58           | .187                         | .35 | .98  | 8-32 x .75   | 6   | 25             | 3.581                 | 8077                                   | 122                     | 161   | 5.811                     |
| 2-1/2" x 12                            | —                            | 3.50                 | .328                         | 2.94           | .219                         | .38 | 1.10 | 10-32 x .75  | 6   | 40             | 3.937                 | 7849                                   | 135                     | 175   | 7.331                     |
| 2-3/4" x 12                            | —                            | 3.75                 | .328                         | 3.19           | .219                         | .37 | 1.10 | 10-32 x .75  | 6   | 40             | 4.318                 | 7620                                   | 153                     | 203   | 10.500                    |
| 3" x 12                                | —                            | 4.00                 | .328                         | 3.49           | .281                         | .33 | 1.10 | 1/4-20 x .75 | 6   | 75             | 4.674                 | 10476                                  | 136                     | 180   | 12.346                    |

1) In same quantity as clamp screws.  
 Spanner wrenches available upon request.

Specifications are subject to change without notice.  
 Specials available upon request.

Special Locknuts with American Standard Threads are made to your specifications. We invite you to furnish a sketch or lay-out indicating your design specifications. We will submit recommendations and application sketches to guarantee an optimum design.

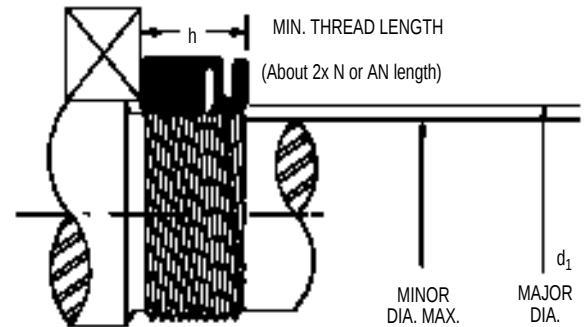
# MALE THREAD DATA

AMERICAN NATIONAL STD. FINE-CLASS 3 FIT  
Limiting Dimensions for External Threads (Bolts)  
to Suit Spieth Adjustable Locknuts

Dimensions in Inches

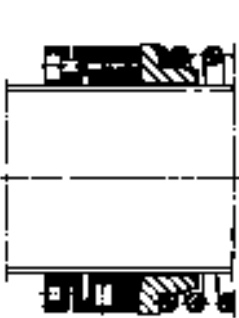
| SPIETH<br>MSR<br>Locknut | Equiv.<br>lock-<br>nut no. | Major dia. |       | Minor<br>dia.-<br>max. | Pitch dia. |        | h    |
|--------------------------|----------------------------|------------|-------|------------------------|------------|--------|------|
|                          |                            | Max.       | Min.  |                        | Max.       | Min.   |      |
| Special                  | N-00                       | .391       | .386  | .3527                  | .3707      | .3681  | .75  |
| Special                  | N-01                       | .469       | .464  | .4307                  | .4487      | .4461  | .75  |
| Special                  | N-02                       | .586       | .581  | .5477                  | .5657      | .5627  | .75  |
| 17x32                    | N-03                       | .664       | .659  | .6257                  | .6437      | .6407  | .75  |
| 20x32                    | N-04                       | .781       | .776  | .7427                  | .7607      | .7573  | .75  |
| 25x32                    | N-05                       | .969       | .964  | .9307                  | .9487      | .9453  | .75  |
| 30x18                    | N-06                       | 1.173      | 1.165 | 1.1048                 | 1.1369     | 1.1329 | .81  |
| 35x18                    | N-07                       | 1.376      | 1.368 | 1.3078                 | 1.3399     | 1.3359 | .88  |
| 40x18                    | N-08                       | 1.563      | 1.555 | 1.4948                 | 1.5269     | 1.5224 | .88  |
| 45x18                    | N-09                       | 1.767      | 1.759 | 1.6988                 | 1.7309     | 1.7264 | .88  |
| 50x18                    | N-10                       | 1.967      | 1.959 | 1.8988                 | 1.9309     | 1.9264 | 1.06 |
| 55x18                    | N-11                       | 2.157      | 2.149 | 2.0888                 | 2.1209     | 2.1158 | 1.06 |
| 60x18                    | N-12                       | 2.360      | 2.352 | 2.2918                 | 2.3239     | 2.3188 | 1.06 |
| 65x18                    | N-13                       | 2.548      | 2.540 | 2.4798                 | 2.5119     | 2.5068 | 1.12 |
| 70x18                    | N-14                       | 2.751      | 2.743 | 2.6828                 | 2.7149     | 2.7098 | 1.12 |
| 75x12                    | AN-15                      | 2.933      | 2.922 | 2.8308                 | 2.8789     | 2.8735 | 1.12 |
| 80x12                    | AN-16                      | 3.137      | 3.126 | 3.0348                 | 3.0829     | 3.0770 | 1.28 |
| 85x12                    | AN-17                      | 3.340      | 3.329 | 3.2378                 | 3.2859     | 3.2785 | 1.28 |
| 90x12                    | AN-18                      | 3.527      | 3.516 | 3.4248                 | 3.4729     | 3.4655 | 1.28 |
| 95x12                    | AN-19                      | 3.730      | 3.719 | 3.6278                 | 3.6759     | 3.6685 | 1.28 |
| 100x12                   | AN-20                      | 3.918      | 3.907 | 3.8158                 | 3.8639     | 3.8565 | 1.28 |
| 105x12                   | AN-21                      | 4.122      | 4.111 | 4.0198                 | 4.0679     | 4.0596 | 1.28 |
| 110x12                   | AN-22                      | 4.325      | 4.314 | 4.2228                 | 4.2709     | 4.2626 | 1.28 |
| 120x12                   | AN-24                      | 4.716      | 4.705 | 4.6138                 | 4.6619     | 4.6536 | 1.50 |
| 130x12                   | AN-26                      | 5.106      | 5.095 | 5.0038                 | 5.0519     | 5.0436 | 1.50 |
| 140x12                   | AN-28                      | 5.497      | 5.486 | 5.3948                 | 5.4429     | 5.4346 | 1.50 |
| 150x12                   | AN-30                      | 5.888      | 5.877 | 5.7858                 | 5.8339     | 5.8256 | 1.50 |
| 160x 8                   | AN-32                      | 6.284      | 6.269 | 6.1306                 | 6.2028     | 6.1937 | 1.62 |
| 170 x 8                  | AN-34                      | 6.659      | 6.644 | 6.5056                 | 6.5778     | 6.5687 | 1.62 |
| 180x 8                   | AN-36                      | 7.066      | 7.051 | 6.9126                 | 6.9848     | 6.9757 | 1.62 |
| 190x 8                   | AN-38                      | 7.472      | 7.457 | 7.3186                 | 7.3908     | 7.3817 | 1.62 |
| 200x 8                   | AN-40                      | 7.847      | 7.832 | 7.6936                 | 7.7658     | 7.7544 | 1.62 |

Fig. 13



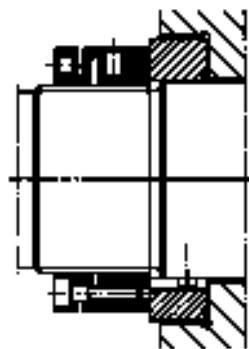
| SPIETH<br>MSR<br>Locknut | Major dia. |        | Minor<br>dia.-<br>max. | Pitch dia. |        | h    |
|--------------------------|------------|--------|------------------------|------------|--------|------|
|                          | Max.       | Min.   |                        | Max.       | Min.   |      |
| 5/8"-18                  | .625       | .6168  | .5568                  | .5889      | .5859  | .75  |
| 3/4"-16                  | .750       | .7410  | .6733                  | .7094      | .7062  | .75  |
| 7/8"-14                  | .875       | .8652  | .7874                  | .8286      | .8250  | .75  |
| 1"-12                    | 1.000      | .9886  | .8978                  | .9459      | .9415  | .75  |
| 1-1/8"-12                | 1.125      | 1.1136 | 1.0228                 | 1.0709     | 1.0664 | .81  |
| 1-1/4"-12                | 1.250      | 1.2388 | 1.1478                 | 1.1959     | 1.1919 | .88  |
| 1-3/8"-12                | 1.375      | 1.3638 | 1.2728                 | 1.3209     | 1.3169 | .88  |
| 1-1/2"-12                | 1.500      | 1.4888 | 1.3978                 | 1.4459     | 1.4419 | .88  |
| 1-5/8"-12                | 1.625      | 1.6138 | 1.5228                 | 1.5709     | 1.5664 | .88  |
| 1-3/4"-12                | 1.750      | 1.7388 | 1.6478                 | 1.6959     | 1.6913 | .88  |
| 1-7/8"-12                | 1.875      | 1.8638 | 1.7728                 | 1.8209     | 1.8163 | .88  |
| 2"-12                    | 2.000      | 1.9888 | 1.8978                 | 1.9459     | 1.9412 | 1.06 |
| 2-1/4"-12                | 2.250      | 2.2388 | 2.1478                 | 2.1959     | 2.1911 | 1.06 |
| 2-1/2"-12                | 2.500      | 2.4888 | 2.3978                 | 2.4459     | 2.4410 | 1.12 |
| 2-3/4"-12                | 2.750      | 2.7388 | 2.6478                 | 2.6959     | 2.6909 | 1.12 |
| 3"-12                    | 3.000      | 2.9888 | 2.8978                 | 2.9459     | 2.9408 | 1.12 |

Fig. 14



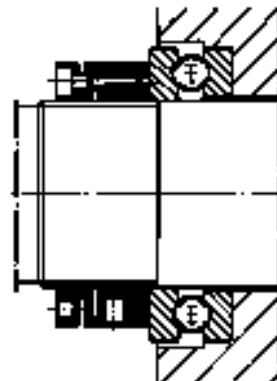
Axial positioning of  
spring on shaft.

Fig. 15



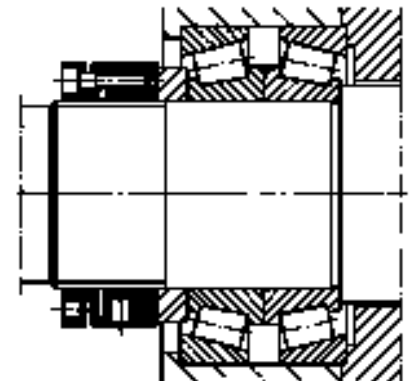
Axial play adjustment  
on thrust washer.

Fig. 16



Adjustment of axial  
thrust bearings.

Fig. 17



Ball screw end  
mounting.