

A M E R I C A N                      S T A N D A R D

# SPINDLE NOSES AND ADJUSTABLE ADAPTERS FOR MULTIPLE SPINDLE DRILLING HEADS

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**ASA B5.11-1964**

UDC 621.9-229

ONE OF A SERIES OF STANDARDS FOR  
SMALL TOOLS AND MACHINE  
TOOL ELEMENTS

*Reaffirmed* 1983

**REAFFIRMED 1994**

FOR CURRENT COMMITTEE PERSONNEL  
PLEASE SEE ASME MANUAL AS-11

## *Sponsors*

American Society of Tool and Manufacturing Engineers  
Society of Automotive Engineers  
National Machine Tool Builders' Association  
The American Society of Mechanical Engineers

*Published by*

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## Foreword

THIS standard for Adjustable Adapters for Multiple Spindle Drilling Heads was developed by Sectional Committee B5 on the Standardization of Small Tools and Machine Tool Elements, organized September, 1922, under procedure of the American Standards Association and is sponsored by the National Machine Tool Builders' Association, the Society of Automotive Engineers, American Society of Tool and Manufacturing Engineers, and The American Society of Mechanical Engineers.

On December 2, 1937, this standard was approved by the American Standards Association and designated as American Standard (ASA B5.11-1937).

Subsequent to a request from the sponsor organizations for a revision of the standard, a new technical committee was appointed on September 24, 1947, to review and make recommendations for revision.

In August, 1953, at the request of the sponsors, the technical committee was authorized to include the standardization of spindle noses for use with adjustable adapters. With the inclusion of spindle noses, the title of the project was changed to Spindle Noses and Adjustable Adapters for Multiple Spindle Drilling Heads.

A draft dated December 1, 1953, was approved by Technical Committee No. 18 and in February, 1954, the proposal was presented to the members of Sectional Committee B5 for letter ballot vote.

Following approval of the sectional committee and sponsor organizations, the proposal was submitted to the American Standards Association for approval and designation as American Standard. This was granted on August 18, 1954, and it was designated as American Standard (ASA B5.11-1954).

In 1959 the committee was reactivated for the purpose of the regular five-year review. Concurrently with the review by committee, a request was received from ASTM Chapter No. 5 of Chicago, Illinois to extend the standard to smaller sizes of adjustable adapters. We acknowledge the help and suggestions received from them.

In a meeting in 1962 it was agreed to consider the subject of the smaller size adapters as a separate standard, both to expedite the issuance of the existing standard for approval of revisions, and also because the physical construction of the smaller sizes had to depart from that of the larger sizes.

The revised standard was submitted to B5 Sectional Committee for letter ballot on December 14, 1962. Following approval by the Sectional Committee and the sponsors, the standard was approved by ASA on June 10, 1964 and designated as American Standard (ASA B5.11-1964).

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# Standardization of Small Tools and Machine Tool Elements, B5

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AMERICAN STANDARD

**Spindle Noses and Adjustable Adapters  
for Multiple Spindle Drilling Heads**

SCOPE AND PURPOSE

This standard is to provide the means for individual axial adjustment of drilling, reaming, and tapping tools, etc. in the spindles of single or multiple spindle heads.

Further, its purpose is to permit interchangeability of adapters into different manufacturers'

machines consistent with necessary accuracy.

Its scope is primarily in the medium to large size of drill spindles, i.e. from No. 0 Morse Taper and .375 American Standard Taper through No. 4 American Standard Taper.

AMERICAN STANDARD

WITH THE SPINDLE BEARING DIAMETERS X AND X' LOCATED IN V BLOCKS THE HOLE S MUST RUN CONCENTRIC WITHIN .0002 INDICATOR READING PER INCH OF LENGTH FROM BEARING DIA. X

END OF SPINDLE TO BE SQUARE WITH HOLE WITHIN .001 INDICATOR READING PER INCH OF NOSE DIAMETER

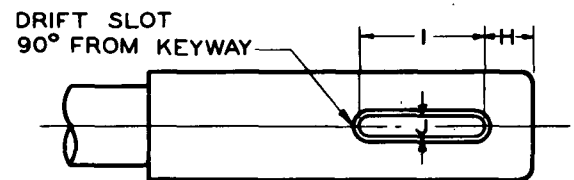
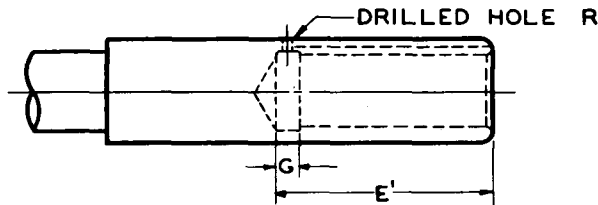
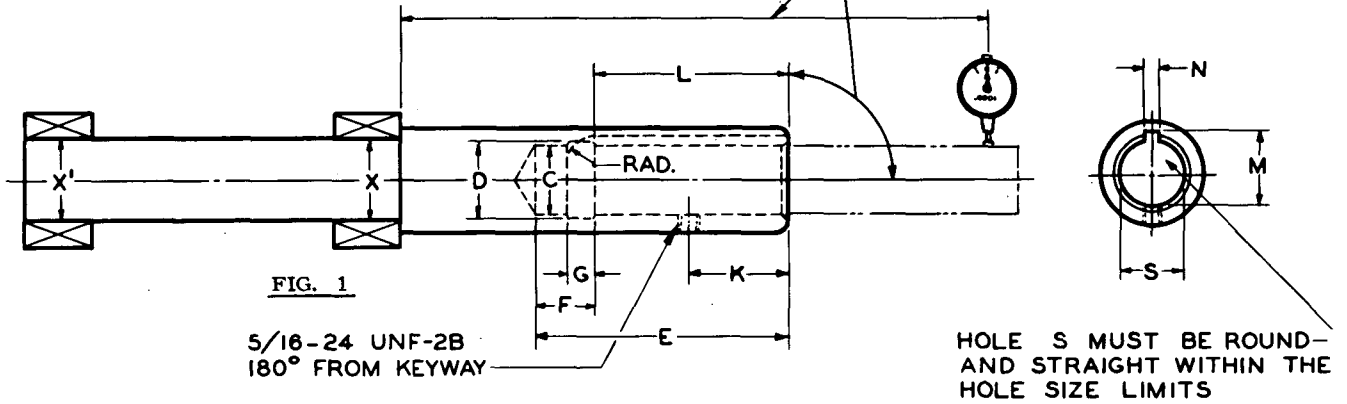


TABLE 1 GENERAL DIMENSIONS FOR SPINDLE NOSES

| Spindle Nose for Adapter Nominal Size | Hole Diameter S |        | Hole Diameter C | Diameter of Relief D | Length of Hole |       | F     | Length of Relief G |
|---------------------------------------|-----------------|--------|-----------------|----------------------|----------------|-------|-------|--------------------|
|                                       | Min             | Max    |                 |                      | E              | E'    |       |                    |
| 1/2                                   | 0.5000          | 0.5005 | 0.493           | 9/16                 | 3 1/8          | 2 7/8 | 5/8   | 3/8                |
| 5/8                                   | 0.6250          | 0.6255 | 0.618           | 11/16                | 3 1/8          | 2 7/8 | 5/8   | 3/8                |
| 3/4                                   | 0.7500          | 0.7505 | 0.740           | 13/16                | 3 1/8          | 2 7/8 | 5/8   | 3/8                |
| 7/8                                   | 0.8750          | 0.8755 | 0.865           | 15/16                | 4              | 3 1/2 | 7/8   | 3/8                |
| 1                                     | 1.0000          | 1.0005 | 0.990           | 1 1/16               | 4              | 3 1/2 | 7/8   | 3/8                |
| 1 1/16                                | 1.0625          | 1.0630 | 1.052           | 1 1/8                | 4              | 3 1/2 | 7/8   | 3/8                |
| 1 3/8                                 | 1.3750          | 1.3755 | 1.365           | 1 7/16               | 5 1/8          | 4 1/2 | 1     | 3/8                |
| 1 7/8                                 | 1.8750          | 1.8755 | 1.860           | 1 15/16              | 6 3/8          | 5 3/8 | 1 3/8 | 3/8                |

TABLE 1 GENERAL DIMENSIONS FOR SPINDLE NOSES (Cont.)

| Spindle<br>Nose<br>For<br>Adapter<br>Nominal<br>Size | End of<br>Spindle<br>to<br>Drift<br>Slot<br>H | Drift Slot  |            | End of<br>Spindle<br>to<br>Tapped<br>Hole<br>K | Length<br>of<br>Keyway<br><br>L | Woodruff Keyway Dimensions |        |            |        | Driller<br>Hole |
|--|---|-------------|------------|--|---------------------------------|----------------------------|--------|------------|--------|-----------------|
|  |   |             |            |  |                                 | Keyway Dimension<br>M      |        | Width<br>N |        |                 |
|  |   | Length<br>I | Width<br>J |  |                                 | Min                        | Max    | Min        | Max    | R               |
| 1/2  | 3/8   | 1 3/4       | 1/4        | 1 1/4  | 2 7/16                          | 0.5756                     | 0.5856 | 0.1290     | 0.1330 | 3/16            |
| 5/8  | 11/16   | 1 3/4       | 1/4        | 1 1/4  | 2 7/16                          | 0.7032                     | 0.7132 | 0.1603     | 0.1643 | 7/32            |
| 3/4  | 11/16   | 1 3/4       | 1/4        | 1 1/4  | 2 7/16                          | 0.8299                     | 0.8399 | 0.1603     | 0.1643 | 7/32            |
| 7/8  | 11/16   | 2 5/16      | 5/16       | 1 9/16   | 3 1/8                           | 0.9685                     | 0.9785 | 0.1915     | 0.1955 | 1/4             |
| 1  | 11/16   | 2 5/16      | 5/16       | 1 9/16   | 3 1/8                           | 1.0948                     | 1.1048 | 0.1915     | 0.1955 | 1/4             |
| 1 1/16   | 11/16   | 2 5/16      | 5/16       | 1 9/16   | 3 1/8                           | 1.1579                     | 1.1679 | 0.1915     | 0.1955 | 1/4             |
| 1 3/8  | 3/4   | 3 1/8       | 3/8        | 1 13/16  | 4                               | 1.4985                     | 1.5085 | 0.2540     | 0.2580 | 5/16            |
| 1 7/8  | 1 1/16  | 3 7/16      | 9/16       | 2 5/16   | 4 7/8                           | 2.0281                     | 2.0381 | 0.3165     | 0.3205 | 3/8             |

# SPINDLE NOSES AND ADJUSTABLE ADAPTERS FOR MULTIPLE SPINDLE DRILLING HEADS

The purpose of these adapters is to obtain axial adjustment for taper shank tools.

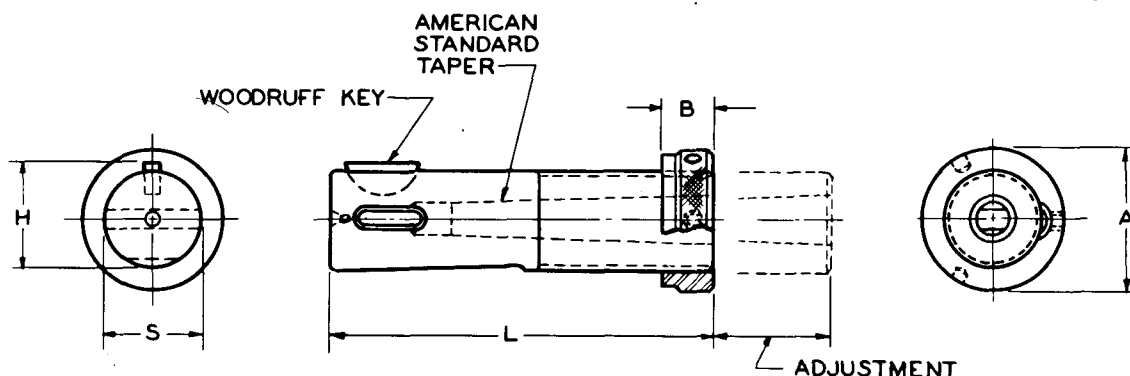


FIG. 2

TABLE 2 GENERAL DIMENSIONS OF ADJUSTABLE ADAPTER ASSEMBLY

| Adapter<br>Nominal<br>Size<br><br>S | American<br>Standard<br>Taper<br>Number | Woodruff<br>Key Size | Top of Key to<br>Opposite Side of<br>Diameter<br>H |        | Adapter<br>Length<br><br>L | Diameter<br>of Nut<br><br>A | Thickness<br>of Nut<br><br>B | Approx.<br>Adjustment<br>of<br>Adapter |
|-------------------------------------|---|----------------------|--|--------|----------------------------|-----------------------------|------------------------------|--|
|                                     |   |                      | Min  | Max    |                            |                             |                              |  |
| 1/2                                 | 0                                       | 1/8 x 5/8            | 0.5605   | 0.5706 | 3                          | 3/4                         | 1/2*                         | 15/16                                  |
| 1/2                                 | 0                                       | 1/8 x 5/8            | 0.5605   | 0.5706 | 3                          | 7/8                         | 1/2                          | 15/16                                  |
| 1/2                                 | .375                                    | 1/8 x 5/8            | 0.5605   | 0.5706 | 3                          | 3/4                         | 1/2*                         | 15/16                                  |
| 1/2                                 | .375                                    | 1/8 x 5/8            | 0.5605   | 0.5706 | 3                          | 7/8                         | 1/2                          | 15/16                                  |
| 5/8                                 | 0                                       | 5/32 x 5/8           | 0.6882   | 0.6982 | 3                          | 7/8                         | 1/2*                         | 1                                      |
| 5/8                                 | 0                                       | 5/32 x 5/8           | 0.6882   | 0.6982 | 3                          | 1                           | 1/2                          | 1                                      |
| 5/8                                 | 1                                       | 5/32 x 5/8           | 0.6882   | 0.6982 | 3                          | 7/8                         | 1/2*                         | 1                                      |
| 5/8                                 | 1                                       | 5/32 x 5/8           | 0.6882   | 0.6982 | 3                          | 1                           | 1/2                          | 1                                      |
| 3/4                                 | 1                                       | 5/32 x 5/8           | 0.8149   | 0.8249 | 3                          | 1 1/4                       | 9/16                         | 15/16                                  |
| 7/8                                 | 1                                       | 3/16 x 3/4           | 0.9535   | 0.9635 | 3 5/8                      | 1 1/4                       | 9/16                         | 1 1/16                                 |
| 7/8                                 | 2                                       | 3/16 x 3/4           | 0.9535   | 0.9635 | 3 5/8                      | 1 1/4                       | 9/16                         | 1 1/16                                 |
| 1                                   | 1                                       | 3/16 x 7/8           | 1.0798   | 1.0898 | 3 5/8                      | 1 1/2                       | 9/16                         | 1 1/16                                 |
| 1                                   | 2                                       | 3/16 x 7/8           | 1.0798   | 1.0898 | 3 5/8                      | 1 1/2                       | 9/16                         | 1 1/16                                 |
| 1 1/16                              | 1                                       | 3/16 x 7/8           | 1.1429   | 1.1529 | 3 5/8                      | 1 9/16                      | 9/16                         | 1 1/16                                 |
| 1 1/16                              | 2                                       | 3/16 x 7/8           | 1.1429   | 1.1529 | 3 5/8                      | 1 9/16                      | 9/16                         | 1 1/16                                 |
| 1 3/8                               | 2                                       | 1/4 x 1              | 1.4835   | 1.4935 | 4 5/8                      | 1 7/8                       | 9/16                         | 1 5/16                                 |
| 1 3/8                               | 3                                       | 1/4 x 1              | 1.4835   | 1.4935 | 4 5/8                      | 1 7/8                       | 9/16                         | 1 5/16                                 |
| 1 7/8                               | 3                                       | 5/16 x 1 1/4         | 2.0131   | 2.0231 | 5 5/8                      | 2 5/8                       | 3/4                          | 1 3/4                                  |
| 1 7/8                               | 4                                       | 5/16 x 1 1/4         | 2.0131   | 2.0231 | 5 5/8                      | 2 5/8                       | 3/4                          | 1 3/4                                  |

\* Jam nut used in pairs. Dimension includes both nuts.

All dimensions given in inches.

FINISH. All surfaces must be finished.

MARKING. Thread size, and manufacturer's name or trademark, and American Standard taper number to be marked on end.

MANUFACTURE. Tolerances on fractional dimensions are  $\pm 0.010$  unless otherwise specified.

No. 0 TAPER. Size No. 0 is not an American Standard Taper, but is included to meet special needs.

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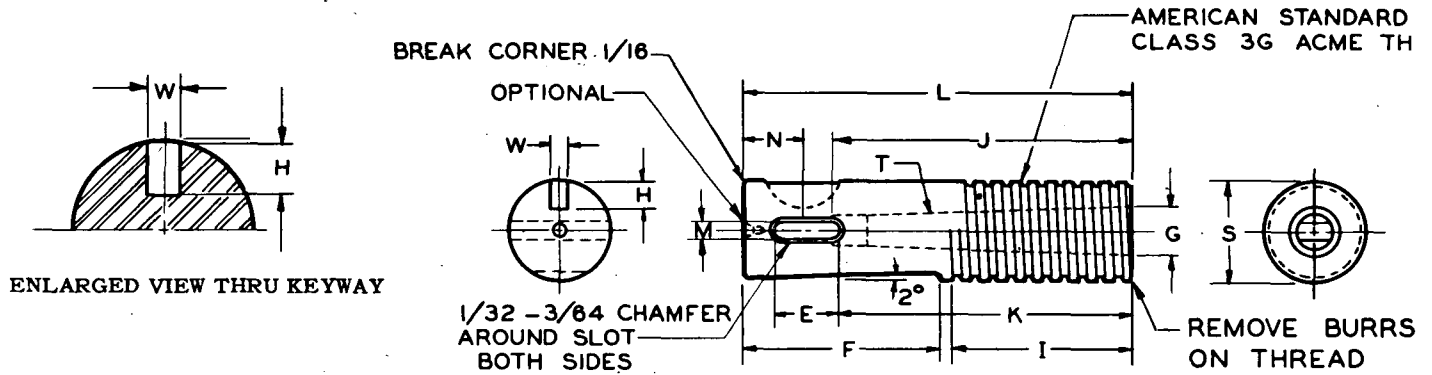


FIG. 3

TABLE 3 DETAIL DIMENSIONS OF ADJUSTABLE ADAPTER BODY

| Adapter<br>Nominal<br>Size | Length<br>of<br>Adapter | American Standard Class 3G ACME Thread |        |                |         |                |         |                        |   | Length<br>of<br>Thread | Length<br>of<br>Flat |
|----------------------------|-------------------------|--|--------|----------------|---------|----------------|---------|------------------------|---|------------------------|----------------------|
|                            |                         | Body Diameter<br>and<br>Major Diameter |        | Pitch Diameter |         | Minor Diameter |         | Threads<br>per<br>Inch | Helix<br>Angle<br>at Basic<br>Pitch Dia |                        |                      |
|                            |                         | Max                                    | Min    | Max            | Min     | Max            | Min     |                        |   |                        |                      |
| S                          | L                       |  |        |                |         |                |         |                        |   | I                      | F                    |
| 1/2                        | 3                       | 0.4993                                 | 0.4990 | 0.46455        | 0.45905 | 0.42750        | 0.41925 | 16                     | 2° 25' 49"                              | 1 7/16                 | 1 1/2                |
| 5/8                        | 3                       | 0.6243                                 | 0.6240 | 0.58905        | 0.58335 | 0.55250        | 0.54395 | 16                     | 1° 55' 9"                               | 1 1/2                  | 1 3/8                |
| 3/4                        | 3                       | 0.7493                                 | 0.7490 | 0.70313        | 0.69663 | 0.65667        | 0.64692 | 12                     | 2° 8' 40"                               | 1 1/2                  | 1 3/8                |
| 7/8                        | 3 5/8                   | 0.8743                                 | 0.8740 | 0.82773        | 0.82103 | 0.78167        | 0.77162 | 12                     | 1° 49' 23"                              | 1 5/8                  | 1 7/8                |
| 1                          | 3 5/8                   | 0.9993                                 | 0.9990 | 0.95233        | 0.94533 | 0.90667        | 0.89647 | 12                     | 1° 35' 8"                               | 1 5/8                  | 1 7/8                |
| 1 1/16                     | 3 5/8                   | 1.0615                                 | 1.0612 | 1.01483        | 1.00783 | 0.96917        | 0.95867 | 12                     | 1° 29' 18"                              | 1 5/8                  | 1 7/8                |
| 1 3/8                      | 4 5/8                   | 1.3740                                 | 1.3737 | 1.32633        | 1.31901 | 1.28167        | 1.27069 | 12                     | 1° 8' 23"                               | 1 7/8                  | 2 5/8                |
| 1 7/8                      | 5 5/8                   | 1.8740                                 | 1.8737 | 1.82543        | 1.81743 | 1.78167        | 1.76967 | 12                     | 0° 49' 44"                              | 2 1/2                  | 3                    |

(Cont. on next page.)



# SPINDLE NOSES AND ADJUSTABLE ADAPTERS FOR MULTIPLE SPINDLE DRILLING HEADS

TABLE 3 DETAIL DIMENSIONS OF ADJUSTABLE ADAPTER BODY (Cont.)

| Adapter<br>Nominal<br>Size<br><br>S | American Standard Taper    |       |                           |                               |                        | End<br>of<br>Body<br>to<br>Drive<br>Slot<br>K | Drive Slot  |            |       | End<br>of<br>Body<br>to<br>Center<br>of Key<br>N | Woodruff Key Slot                  |                                |            |        |            |        |
|-------------------------------------|----------------------------|-------|---------------------------|-------------------------------|------------------------|---|-------------|------------|-------|--|------------------------------------|--------------------------------|------------|--------|------------|--------|
|                                     | Diameter<br>Large End<br>G |       | Taper<br>Per<br>Foot<br>T | Depth<br>Taper<br>Socket<br>J | ASA<br>Taper<br>Number |   | Length<br>E | Width<br>M |       |  | Woodruff<br>Key<br>Nominal<br>Size | American<br>Standard<br>Number | Width<br>W |        | Depth<br>H |        |
|                                     |                            |       |                           |                               |                        |   |             | Max        | Min   |  |                                    |                                | Max        | Min    | Max        | Min    |
|                                     |                            | Max   | Min                       |                               |                        |   |             |            | Max   |  | Min                                |                                |            | Max    | Min        | Max    |
| 1/2                                 | 0.356                      | 0.354 | 0.62460                   | 2 1/16                        | 0                      | 1 15/16                                       | 9/16        | 0.178      | 0.172 | 7/16   | 1/8 x 5/8                          | 405                            | 0.1255     | 0.1240 | 0.1875     | 0.1825 |
| 1/2                                 | 0.375                      | 0.373 | 0.50200                   | 1 5/8                         | .375                   | 1 15/32                                       | 5/8         | 0.209      | 0.203 | 7/16   | 1/8 x 5/8                          | 405                            | 0.1255     | 0.1240 | 0.1875     | 0.1825 |
| 5/8                                 | 0.356                      | 0.354 | 0.62460                   | 2 1/16                        | 0                      | 1 15/16                                       | 9/16        | 0.178      | 0.172 | 1/2  | 5/32 x 5/8                         | 505                            | 0.1568     | 0.1553 | 0.1719     | 0.1669 |
| 5/8                                 | 0.475                      | 0.473 | 0.59858                   | 2 3/16                        | 1                      | 2 1/16  | 3/4         | 0.224      | 0.218 | 1/2  | 5/32 x 5/8                         | 505                            | 0.1568     | 0.1553 | 0.1719     | 0.1669 |
| 3/4                                 | 0.475                      | 0.473 | 0.59858                   | 2 3/16                        | 1                      | 2 1/16  | 3/4         | 0.224      | 0.218 | 1/2  | 5/32 x 5/8                         | 505                            | 0.1568     | 0.1553 | 0.1719     | 0.1669 |
| 7/8                                 | 0.475                      | 0.473 | 0.59858                   | 2 3/16                        | 1                      | 2 1/16  | 3/4         | 0.224      | 0.218 | 1/2  | 3/16 x 3/4                         | 606                            | 0.1880     | 0.1863 | 0.2193     | 0.2143 |
| 7/8                                 | 0.700                      | 0.698 | 0.59941                   | 2 21/32                       | 2                      | 2 1/2   | 7/8         | 0.272      | 0.266 | 1/2  | 3/16 x 3/4                         | 606                            | 0.1880     | 0.1863 | 0.2193     | 0.2143 |
| 1                                   | 0.475                      | 0.473 | 0.59858                   | 2 3/16                        | 1                      | 2 1/16  | 3/4         | 0.224      | 0.218 | 5/8  | 3/16 x 7/8                         | 607                            | 0.1880     | 0.1863 | 0.2813     | 0.2763 |
| 1                                   | 0.700                      | 0.698 | 0.59941                   | 2 21/32                       | 2                      | 2 1/2   | 7/8         | 0.272      | 0.266 | 5/8  | 3/16 x 7/8                         | 607                            | 0.1880     | 0.1863 | 0.2813     | 0.2763 |
| 1 1/16                              | 0.475                      | 0.473 | 0.59858                   | 2 3/16                        | 1                      | 2 1/16  | 3/4         | 0.224      | 0.218 | 5/8  | 3/16 x 7/8                         | 607                            | 0.1880     | 0.1863 | 0.2813     | 0.2763 |
| 1 1/16                              | 0.700                      | 0.698 | 0.59941                   | 2 21/32                       | 2                      | 2 1/2   | 7/8         | 0.272      | 0.266 | 5/8  | 3/16 x 7/8                         | 607                            | 0.1880     | 0.1863 | 0.2813     | 0.2763 |
| 1 3/8                               | 0.700                      | 0.698 | 0.59941                   | 2 21/32                       | 2                      | 2 1/2   | 7/8         | 0.272      | 0.266 | 3/4  | 1/4 x 1                            | 808                            | 0.2505     | 0.2487 | 0.3130     | 0.3080 |
| 1 3/8                               | 0.938                      | 0.936 | 0.60235                   | 3 5/16                        | 3                      | 3 1/16  | 1 3/16      | 0.334      | 0.328 | 3/4  | 1/4 x 1                            | 808                            | 0.2505     | 0.2487 | 0.3130     | 0.3080 |
| 1 7/8                               | 0.938                      | 0.936 | 0.60235                   | 3 5/16                        | 3                      | 3 1/16  | 1 3/16      | 0.334      | 0.328 | 15/16  | 5/16 x 1 1/4                       | 1010                           | 0.3130     | 0.3111 | 0.3908     | 0.3858 |
| 1 7/8                               | 1.231                      | 1.229 | 0.62326                   | 4 3/16                        | 4                      | 3 7/8   | 1 1/4       | 0.490      | 0.484 | 15/16  | 5/16 x 1 1/4                       | 1010                           | 0.3130     | 0.3111 | 0.3908     | 0.3858 |

**CENTRICITY OF HOLE G.** Hole must run true with respect to outside diameter, within 0.002 in. total indicator reading on a plug, at all points up to 6 in. away from end of adapter.

**TRALITY OF DRIVING SLOT M.** To be within .0025 with center line of taper (.005 Total Indicator Variation).

**KING.** Adapter size and ASA taper number to be marked on end.

**UFACTURING.** All burrs must be removed and threaded portion must be free of scale. Tolerances on fractional dimensions are .010 in. unless otherwise specified.

**W THREAD.** The pitch diameter of the threads and the axial center line of adapter shall be parallel within 0.002 in. per inch ngth. The major diameter is based on maintaining the basic mating hole size of +0.0005 - 0.0000.

**0 TAPER.** Size No. 0 is not an American Standard Taper, but is included to meet special needs.

**DRUFF KEY.** Assembling of key must not result in growth of shank O.D. beyond maximum eter given.

# AMERICAN STANDARD

TABLE 4 TAPER AND SHANK SIZES

| Adapter<br>Nominal<br>Shank Size<br>and ACME<br>Thread<br>S | Style |     | American<br>Standard<br>Taper<br>Number | Nose<br>Dia<br>D | Minimum<br>Length of<br>Extension<br>From Nut<br>C |
|---|-------|-----|---|------------------|--|
|   | "a"   | "b" |   |                  |  |
| 1/2 - 16  | a     |     | 0                                       | 1/2              | 3  |
| 1/2 - 16  | a     |     | .375                                    | 1/2              | 2 1/2  |
| 5/8 - 16  |       | b   | 0                                       | 1/2              | 3  |
| 5/8 - 16  | a     |     | 1                                       | 5/8              | 3  |
| 3/4 - 12  |       | b   | 1                                       | 5/8              | 3  |
| 3/4 - 12  | a     |     | 2                                       | 1 1/16           | 3 1/2  |
| 7/8 - 12  |       | b   | 1                                       | 3/4              | 3  |
| 7/8 - 12  | a     |     | 2                                       | 1 1/16           | 3 1/2  |
| 1 - 12  |       | b   | 1                                       | 7/8              | 3  |
| 1 - 12  |       | b   | 2                                       | 7/8              | 3 1/2  |
| 1 - 12  | a     |     | 3                                       | 1 5/16           | 4 1/2  |
| 1 1/16 - 12   |       | b   | 1                                       | 15/16            | 3  |
| 1 1/16 - 12   |       | b   | 2                                       | 15/16            | 3 1/2  |
| 1 1/16 - 12   | a     |     | 3                                       | 1 5/16           | 4 1/2  |
| 1 3/8 - 12  |       | b   | 2                                       | 1 1/4            | 3 1/2  |
| 1 3/8 - 12  |       | b   | 3                                       | 1 1/4            | 4 1/2  |
| 1 3/8 - 12  | a     |     | 4                                       | 1 3/4            | 5 1/2  |
| 1 7/8 - 12  |       | b   | 3                                       | 1 3/4            | 4 1/2  |
| 1 7/8 - 12  |       | b   | 4                                       | 1 3/4            | 5 1/2  |

DIMENSION C. Additional lengths in 1/2 - inch increments.  
No. 0 TAPER. Size No. 0 is not an American Standard Taper, but  
is included to meet special needs.

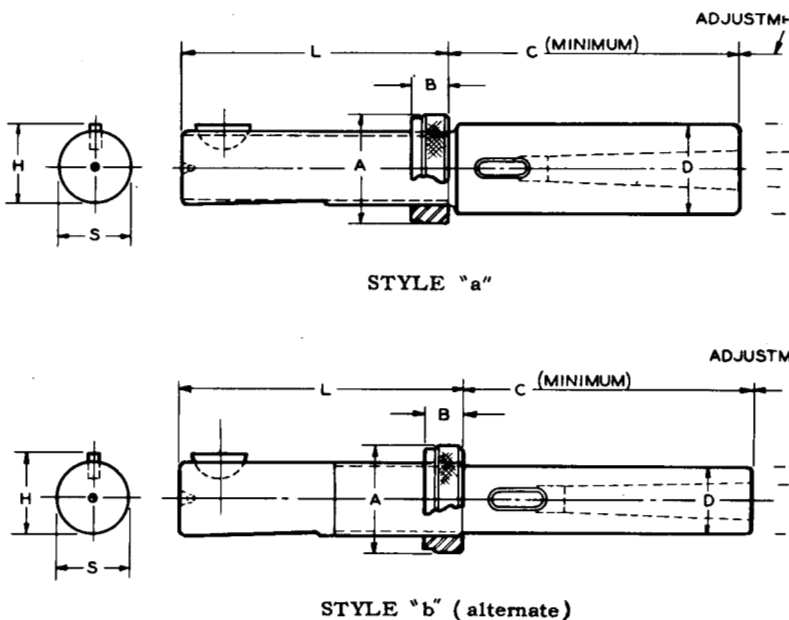


FIG. 4

TABLE 5 GENERAL DIMENSIONS OF ADJUSTABLE EXTENSION ADAPTER ASSEMBLY (STYLE "a" AND "b")

| Adapter<br>Nominal<br>Shank<br>Size<br>S | Woodruff<br>Key Size | Top of Key to<br>Opposite Side of Dia |        | Length<br>of<br>Shank<br><br>L | Diameter<br>of Nut<br><br>A | Thickness<br>of Nut<br><br>B | Approximate<br>Adjustment<br>of<br>Adapter |
|--|----------------------|---------------------------------------|--------|--------------------------------|-----------------------------|------------------------------|--|
|  |                      | H                                     |        |                                |                             |                              |  |
|  |                      | Min                                   | Max    |                                |                             |                              |  |
| 1/2                                      | 1/8 x 5/8            | 0.5605                                | 0.5706 | 3                              | 3/4                         | 1/2*                         | 15/16                                      |
| 1/2                                      | 1/8 x 5/8            | 0.5605                                | 0.5706 | 3                              | 7/8                         | 1/2                          | 15/16                                      |
| 5/8                                      | 5/32 x 5/8           | 0.6882                                | 0.6982 | 3                              | 7/8                         | 1/2*                         | 1  |
| 5/8                                      | 5/32 x 5/8           | 0.6882                                | 0.6982 | 3                              | 1                           | 1/2                          | 1  |
| 3/4                                      | 5/32 x 5/8           | 0.8149                                | 0.8249 | 3                              | 1 1/4                       | 9/16                         | 15/16                                      |
| 7/8                                      | 3/16 x 3/4           | 0.9535                                | 0.9635 | 3 5/8                          | 1 1/4                       | 9/16                         | 1 1/16                                     |
| 1  | 3/16 x 7/8           | 1.0798                                | 1.0898 | 3 5/8                          | 1 1/2                       | 9/16                         | 1 1/16                                     |
| 1 1/16                                   | 3/16 x 7/8           | 1.1429                                | 1.1529 | 3 5/8                          | 1 9/16                      | 9/16                         | 1 1/16                                     |
| 1 3/8                                    | 1/4 x 1              | 1.4835                                | 1.4935 | 4 5/8                          | 1 7/8                       | 9/16                         | 1 5/16                                     |
| 1 7/8                                    | 5/16 x 1 1/4         | 2.0131                                | 2.0231 | 5 5/8                          | 2 5/8                       | 3/4                          | 1 3/4                                      |

\* Jam nut used in pairs. Dimension includes both nuts.

All dimensions given in inches.

FINISH. All surfaces must be finished.

MARKING. Thread size, and manufacturer's name or trademark, and ASA taper number to be marked on end.

MANUFACTURE. Tolerances on fractional dimensions are  $\pm 0.010$  unless otherwise specified.

# SPINDLE NOSES AND ADJUSTABLE ADAPTERS FOR MULTIPLE SPINDLE DRILLING HEADS

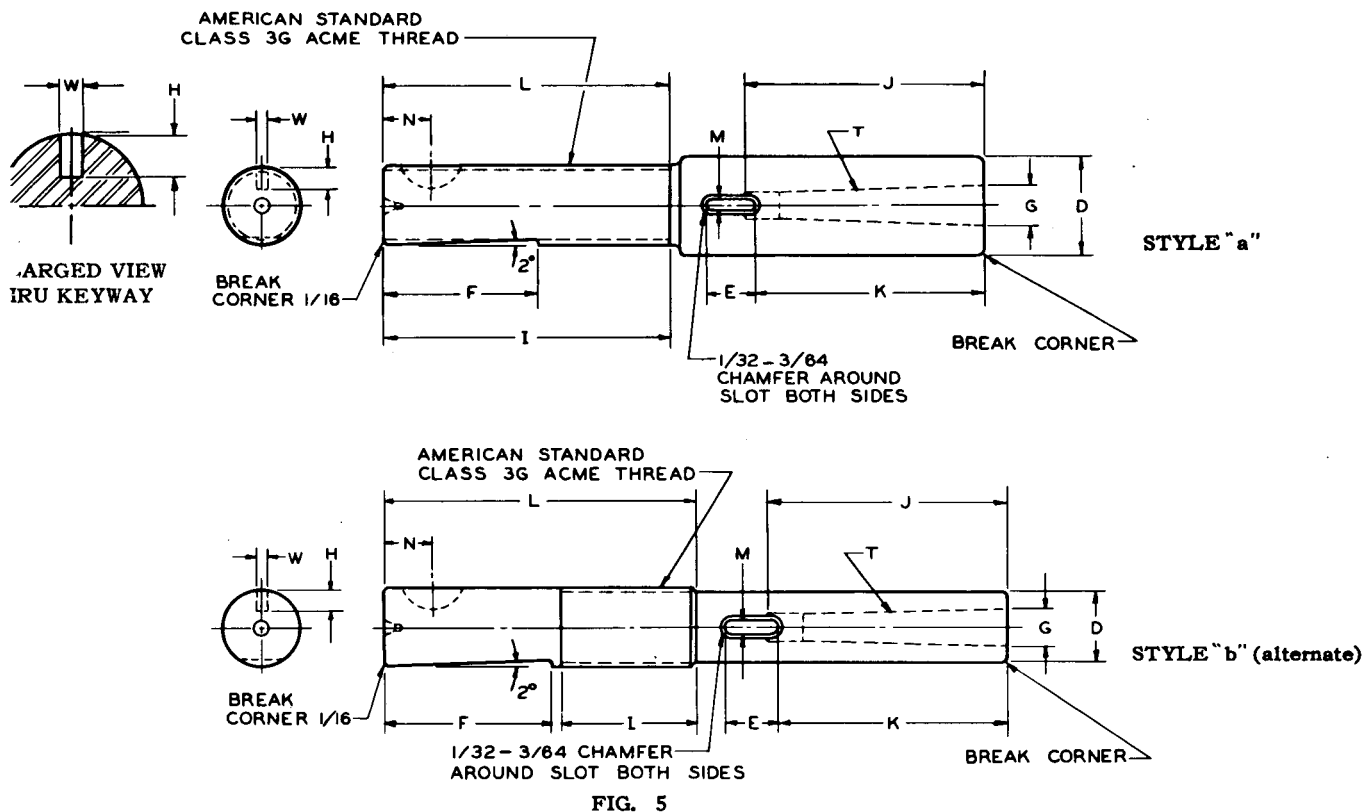


TABLE 6 DETAIL DIMENSIONS OF ADJUSTABLE EXTENSION ADAPTERS (STYLE "a" AND "b")

| Adapter<br>Nominal<br>Size and<br>ACME<br>Thread | American Standard Class 3G ACME Thread |        |                |         |                |         |   | Length<br>of<br>Shank<br>L | Length<br>of<br>Flat<br>F | Length of<br>Thread |              |
|--|--|--------|----------------|---------|----------------|---------|---|----------------------------|---------------------------|---------------------|--------------|
|  | Major Diameter                         |        | Pitch Diameter |         | Minor Diameter |         | Helix<br>Angle<br>at Basic<br>Pitch Dia |                            |                           | I                   |              |
|  | Max                                    | Min    | Max            | Min     | Max            | Min     |   |                            |                           | Style<br>"a"        | Style<br>"b" |
| 1/2 - 16   | 0.4993                                 | 0.4990 | 0.46455        | 0.45905 | 0.42750        | 0.41925 | 2°25' 49"                               | 3.00                       | 1 1/2                     |                     | 1 7/16       |
| 5/8 - 16   | 0.6243                                 | 0.6240 | 0.58905        | 0.58335 | 0.55250        | 0.54395 | 1°55' 9"                                | 3.00                       | 1 3/8                     | 3                   | 1 1/2        |
| 3/4 - 12   | 0.7493                                 | 0.7490 | 0.70313        | 0.69663 | 0.65667        | 0.64692 | 2° 8' 40"                               | 3.00                       | 1 3/8                     | 3                   | 1 1/2        |
| 7/8 - 12   | 0.8743                                 | 0.8740 | 0.82773        | 0.82103 | 0.78167        | 0.77162 | 1°49' 23"                               | 3.62                       | 1 7/8                     | 3 5/8               | 1 5/8        |
| - 12   | 0.9993                                 | 0.9990 | 0.95233        | 0.94533 | 0.90667        | 0.89647 | 1°35' 8"                                | 3.62                       | 1 7/8                     | 3 5/8               | 1 5/8        |
| 1/16 - 12  | 1.0615                                 | 1.0612 | 1.01483        | 1.00783 | 0.96917        | 0.95867 | 1°29' 18"                               | 3.62                       | 1 7/8                     | 3 5/8               | 1 5/8        |
| 3/8 - 12   | 1.3740                                 | 1.3737 | 1.32633        | 1.31901 | 1.28167        | 1.27069 | 1° 8' 23"                               | 4.62                       | 2 5/8                     | 4 5/8               | 1 7/8        |
| 7/8 - 12   | 1.8740                                 | 1.8737 | 1.82543        | 1.81743 | 1.78167        | 1.76967 | 0°49' 44"                               | 5.62                       | 3                         | 5 5/8               |              |

(Cont. on next page)

AMERICAN STANDARD

TABLE 6 DETAIL DIMENSIONS OF ADJUSTABLE EXTENSION ADAPTERS (STYLE "a" AND "b") (Cont.)

| KEY DATA | Adapter<br>Nominal<br>Size and<br>ACME<br>Thread | End of<br>Shank to<br>Center<br>of Key<br>N | Woodruff Key Slot |                                |            |        |            |        |
|----------|--|---|-------------------|--------------------------------|------------|--------|------------|--------|
|          |  |   | Nominal<br>Size   | American<br>Standard<br>Number | Width<br>W |        | Depth<br>H |        |
|          |  |   |                   |                                | Max        | Min    | Max        | Min    |
|          | 1/2 - 16   | 7/16  | 1/8 x 5/8         | 405                            | 0.1255     | 0.1240 | 0.1875     | 0.1825 |
|          | 5/8 - 16   | 1/2   | 5/32 x 5/8        | 505                            | 0.1568     | 0.1553 | 0.1719     | 0.1669 |
|          | 3/4 - 12   | 1/2   | 5/32 x 5/8        | 505                            | 0.1568     | 0.1553 | 0.1719     | 0.1669 |
|          | 7/8 - 12   | 1/2   | 3/16 x 3/4        | 606                            | 0.1880     | 0.1863 | 0.2193     | 0.2143 |
|          | 1 - 12   | 5/8   | 3/16 x 7/8        | 607                            | 0.1880     | 0.1863 | 0.2813     | 0.2763 |
|          | 1 1/16 - 12                                      | 5/8   | 3/16 x 7/8        | 607                            | 0.1880     | 0.1863 | 0.2813     | 0.2763 |
|          | 1 3/8 - 12                                       | 3/4   | 1/4 x 1           | 808                            | 0.2505     | 0.2487 | 0.3130     | 0.3080 |
|          | 1 7/8 - 12                                       | 15/16                                       | 5/16 x 1 1/4      | 1010                           | 0.3130     | 0.3111 | 0.3908     | 0.3858 |

TABLE 6 DETAIL DIMENSIONS OF ADJUSTABLE EXTENSION ADAPTERS (STYLE "a" AND "b") (Cont.)

TAPER DATA

| American Standard Taper                 |                               |                           |                            |       | Drive Slot                     |             |            |       |  |
|---|-------------------------------|---------------------------|----------------------------|-------|--------------------------------|-------------|------------|-------|--|
| American<br>Standard<br>Taper<br>Number | Depth<br>Taper<br>Socket<br>J | Taper<br>per<br>Foot<br>T | Diameter<br>Large End<br>G |       | End of<br>Nose<br>to Slot<br>K | Length<br>E | Width<br>M |       |  |
|   |                               |                           | Max                        | Min   |                                |             | Max        | Min   |  |
|   |                               |                           |                            |       |                                |             |            |       |  |
| 0                                       | 2 1/16                        | 0.62460                   | 0.356                      | 0.354 | 1 15/16                        | 9/16        | 0.178      | 0.172 |  |
| .375                                    | 1 5/8                         | 0.50200                   | 0.375                      | 0.373 | 1 15/32                        | 5/8         | 0.209      | 0.203 |  |
| 1                                       | 2 3/16                        | 0.59858                   | 0.475                      | 0.473 | 2 1/16                         | 3/4         | 0.224      | 0.218 |  |
| 2                                       | 2 21/32                       | 0.59941                   | 0.700                      | 0.698 | 2 1/2                          | 7/8         | 0.272      | 0.266 |  |
| 3                                       | 3 5/16                        | 0.60235                   | 0.938                      | 0.936 | 3 1/16                         | 1 3/16      | 0.334      | 0.328 |  |
| 4                                       | 4 3/16                        | 0.62326                   | 1.231                      | 1.229 | 3 7/8                          | 1 1/4       | 0.490      | 0.484 |  |

**CONCENTRICITY OF HOLE G.** Hole must run true with respect to outside diameter, within 0.002 in. total indicator reading on a taper plug, at all points up to 6 in. away from end of adapter.

**CENTRALITY OF DRIVING SLOT M.** To be within 0.0025 with center line of taper (0.005 Total Indicator Variation).

**MARKING.** Adapter size and American Standard taper number to be marked on end.

**MANUFACTURING.** All burrs must be removed and threaded portion must be free of scale. Tolerances on fractional dimensions are  $\pm 0.010$  in. unless otherwise specified.

**SCREW THREAD.** The pitch diameter of the threads and the axial center line of adapter shall be parallel within 0.002 in. per inch of length. The major diameter is based on maintaining the basic mating hole size of  $+0.0005-0.0000$ .

**No. 0 TAPER.** Size No. 0 is not an American Standard Taper, but is included to meet special needs.

**WOODRUFF KEY.** Assembling of key must not result in growth of shank O.D. beyond maximum diameter given.

# SPINDLE NOSES AND ADJUSTABLE ADAPTERS FOR MULTIPLE SPINDLE DRILLING HEADS

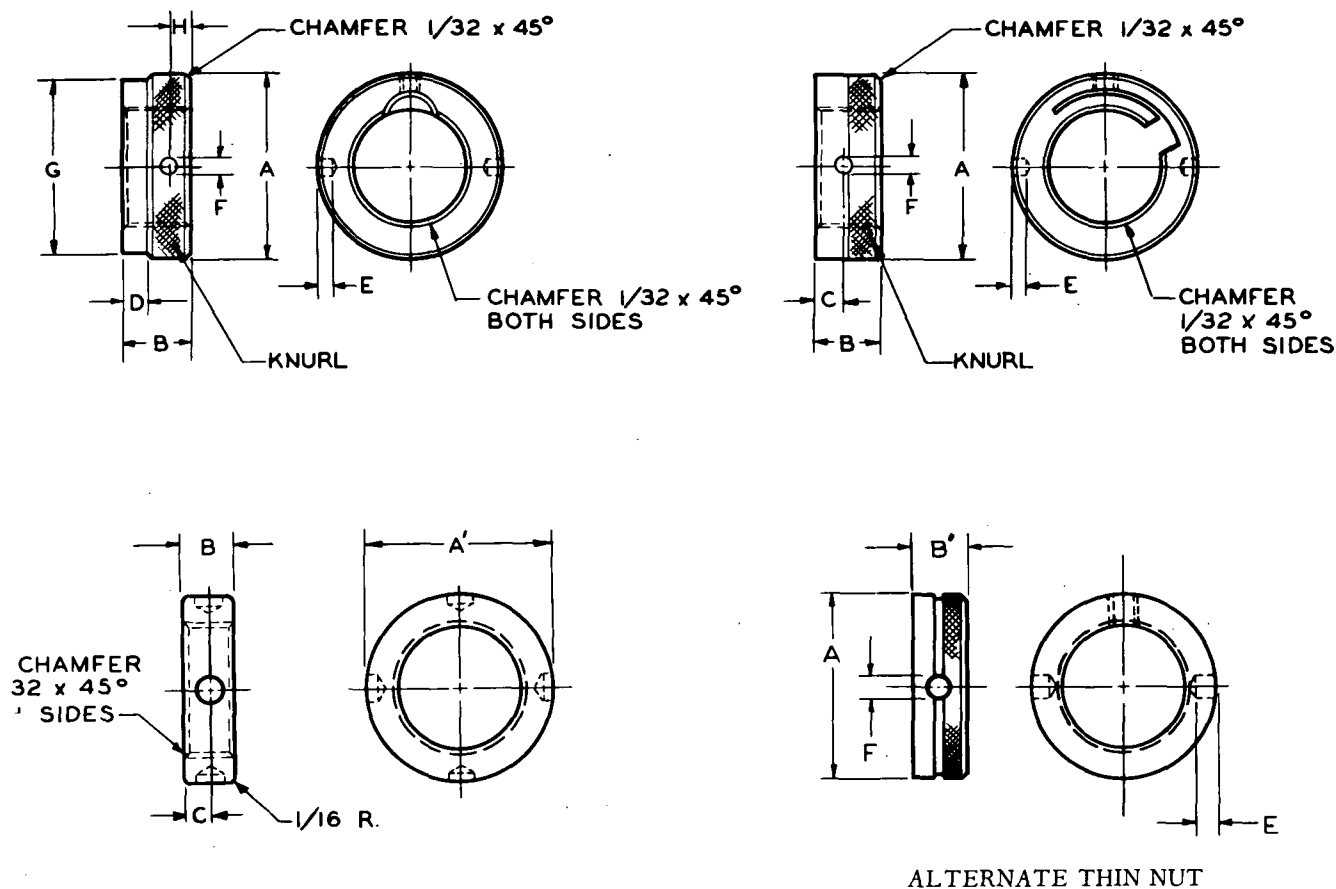


FIG. 6

TABLE 7 DETAIL DIMENSIONS FOR ADJUSTABLE ADAPTER LOCK NUTS

| Adapter<br>Nominal<br>Size and<br>ACME<br>Thread | Internal American Standard Class 3G ACME Thread |         |                |         |                |         |                | Dia of<br>Nut<br>A | Dia of<br>Nut<br>A' | Thick-<br>ness<br>B | Thick-<br>ness<br>(Alt.)<br>B' | C    | D     | Holes for<br>Spanner<br>Wrenches |          | G       | H     |
|--|---|---------|----------------|---------|----------------|---------|----------------|--------------------|---------------------|---------------------|--------------------------------|------|-------|----------------------------------|----------|---------|-------|
|  | Major Diameter                                  |         | Pitch Diameter |         | Minor Diameter |         | Helix<br>Angle |                    |                     |                     |                                |      |       | Depth<br>E                       | Dia<br>F |         |       |
|  | Min   | Max     | Min            | Max     | Min            | Max     |                |                    |                     |                     |                                |      |       |                                  |          |         |       |
| 1/2 - 16   | 0.5100  | 0.5200  | 0.46875        | 0.47425 | 0.43750        | 0.44250 | 2° 25' 49"     |                    | 3/4                 | 1/4                 | 3/8                            | 1/8  |       | 1/16                             | 1/8      |         |       |
| 1/2 - 16   | 0.5100  | 0.5200  | 0.46875        | 0.47425 | 0.43750        | 0.44250 | 2° 25' 49"     | 7/8                |                     | 1/2                 | 3/8                            | 1/4  | 3/16  | 3/32                             | 3/16     | 13/16   | 5/32  |
| 5/8 - 16   | 0.63500   | 0.64500 | 0.59375        | 0.59945 | 0.56250        | 0.56750 | 1° 55' 9"      |                    | 7/8                 | 1/4                 | 3/8                            | 1/8  |       | 1/16                             | 1/8      |         |       |
| 5/8 - 16   | 0.63500   | 0.64500 | 0.59375        | 0.59945 | 0.56250        | 0.56750 | 1° 55' 9"      | 1                  |                     | 1/2                 | 3/8                            | 1/4  | 3/16  | 3/32                             | 3/16     | 15/16   | 5/32  |
| 3/4 - 12   | 0.76000   | 0.77000 | 0.70833        | 0.71483 | 0.66667        | 0.67167 | 2° 8' 40"      | 1 1/4              |                     | 9/16                | 3/8                            | 9/32 | 13/64 | 1/8                              | 1/4      | 1 3/16  | 3/16  |
| 7/8 - 12   | 0.88500   | 0.89500 | 0.83333        | 0.83893 | 0.79167        | 0.79667 | 1° 49' 23"     | 1 1/4              |                     | 9/16                | 3/8                            | 9/32 | 13/64 | 1/8                              | 1/4      | 1 3/16  | 3/16  |
| - 12   | 1.01000   | 1.02000 | 0.95833        | 0.96433 | 0.91667        | 0.92167 | 1° 35' 8"      | 1 1/2              |                     | 9/16                | 3/8                            | 9/32 | 13/64 | 1/8                              | 1/4      | 1 7/16  | 3/16  |
| 1/16 - 12  | 1.07250   | 1.08250 | 1.02083        | 1.02783 | 0.97917        | 0.98417 | 1° 29' 18"     | 1 9/16             |                     | 9/16                | 3/8                            | 9/32 | 13/64 | 1/8                              | 1/4      | 1 1/2   | 3/16  |
| 3/8 - 12   | 1.38500   | 1.39500 | 1.33333        | 1.34065 | 1.29167        | 1.29667 | 1° 8' 23"      | 1 7/8              |                     | 9/16                | 3/8                            | 9/32 | 13/64 | 1/8                              | 1/4      | 1 13/16 | 3/16  |
| 7/8 - 12   | 1.88500   | 1.89500 | 1.83333        | 1.84133 | 1.79167        | 1.79667 | 0° 49' 44"     | 2 5/8              |                     | 3/4                 | 1/2                            | 3/8  | 9/32  | 3/16                             | 1/4      | 2 9/16  | 15/64 |

No attempt is made to identify the preferred means of locking, as this varies with different manufacturers.

MANUFACTURING. All burrs must be removed and threads must be free of scale. Tolerances on fractional dimensions are  $\pm 0.010$  in. unless otherwise specified. Face of nut to be square with respect to thread within 0.002 in. full indicator reading.

# American Standards for Small Tools and Machine Tool Elements

| TITLE OF STANDARD   |                              |
|---|------------------------------|
| T-Slots, Their Bolts, Nuts Tongues, and Cutters . . . . .   | B5.1-1949                    |
| Milling Cutters . . . . .   | B5.3-1960                    |
| Taps—Cut and Ground Threads . . . . .   | B5.4-1959                    |
| Rotating Air Cylinders and Adapters . . . . .   | B5.5-1959                    |
| Jig Bushings . . . . .  | B5.6-1962                    |
| Circular and Dovetailed Forming Tool Blanks . . . . .   | B5.7-1954                    |
| Chucks and Chuck Jaws . . . . .   | B5.8-1954 (Reaffirmed 1959)  |
| Spindle Noses for Tool Room Lathes, Engine Lathes,<br>Turret Lathes, and Automatic Lathes . . . . . | B5.9-1960                    |
| Machine Tapers . . . . .  | B5.10-1963                   |
| Spindle Noses and Adjustable Adapters for<br>Multiple Spindle Drilling Heads . . . . .              | B5.11-1964                   |
| Twist Drills . . . . .  | B5.12-1958                   |
| Reamers . . . . .   | B5.14-1959                   |
| Involute Splines, Serrations and Inspection . . . . .   | B5.15-1960                   |
| Accuracy of Engine and Tool Room Lathes . . . . .   | B5.16-1952                   |
| Markings for Identifying Grinding Wheels and Other Bonded Abrasives . . . . .                       | B5.17-1958                   |
| Spindle Noses and Arbors for Milling Machines . . . . .   | B5.18-1960                   |
| Life Tests of Single-Point Tools . . . . .  | B5.19-1946 (Reaffirmed 1953) |
| Machine Pins . . . . .  | B5.20-1958                   |
| Straight Cut-Off Blades for Lathes and Screw Machines . . . . .                                     | B5.21-1949                   |
| Single Point Tools and Tool Posts . . . . .   | B5.22-1950                   |
| Inserted Blade Milling Cutter Bodies . . . . .  | B5.23-1958                   |
| Punch and Die Sets for Two-Post Punch Press Tools . . . . .   | B5.25-1950                   |
| Drill Drivers . . . . .   | B5.27-1959                   |
| Mounting Dimensions of Lubricating and Coolant<br>Pumps for Machine Tools . . . . .                 | B5.28-1958                   |
| High Speed Steel and Cast Nonferrous Single Point Tools<br>and Tool Holders . . . . .               | B5.29-1959                   |
| Knurling . . . . .  | B5.30-1958                   |
| Designation and Working Ranges of Grinding Machines . . . . .                                       | B5.32 & 33-1953              |
| Life Tests for Single-Point Tools of Sintered Carbide . . . . .                                     | B5.34-1956                   |
| Machine Mounting Specifications for Abrasive Discs and<br>Plate Mounted Wheels . . . . .            | B5.35-1957                   |
| Carbide Blanks and Cutting Tools . . . . .  | B5.36-1957                   |
| Driving and Spindle Ends for Portable Air and Electric Tools . . . . .                              | B5.38-1958                   |
| Spindle Flanges for Precision Boring Machines . . . . .   | B5.39-1961                   |
| Spindle Noses and Tool Shanks for Horizontal Boring Machines . . . . .                              | B5.40-1962                   |

Binders for holding standards are available.

A complete list of American Standards published by The American Society of Mechanical Engineers obtainable upon request.



M00008