STD.ASME B18.9-ENGL 1996 ■ 0759670 0579139 98T ■

ASME B18.9-1996
(Revision of ASA B18.9-1958)

# PLOW BOLTS
# (INCH SERIES)

AN AMERICAN NATIONAL STANDARD

The American Society of
Mechanical Engineers

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# FOREWORD

(This Foreword is not part of ASME B18.9-1996.)

ASME Standards Committee B18 for the Standardization of Bolts, Nuts, Rivets, Screws, Washers, and similar Fasteners (formerly American National Standards Committee B18), was organized in March 1992, as Sectional Committee B18 under the aegis of the American Engineering Standards Committee (later the American Standards Association, the United States of America Standards Institute and, as of October 6, 1969, the American National Standards Institute, Inc.) with the Society of Automotive Engineers and the American Society of Mechanical Engineers as joint sponsors. Subcommittees 2, 5, and 6 (later redesignated as Subcommittee 9) were subsequently established and charged with the responsibilities for the technical content of standards for external drive bolts and nuts, round unslotted head bolts, and plow bolts, respectively.

The National Association of Farm Equipment Manufacturers had previously appointed a committee to standardize plow bolts. This committee was at work simplifying the list of types then in use. Its first recommendation reduced the total number to seven types representing 182 varieties. These were the No. 1 Key Head; No. 2 Round Countersunk; No. 3 Round Head, Square Neck; No. 4 Square Head; No. 5 Large Round Countersunk; No. 6 Round Head, Heavy Key; No. 7 Round Head, Reverse Key. Later at a general conference called by the Division of Simplified Practice, U.S. Department of Commerce, the NAFEM Committee recommended four types of plow bolts representing 42 varieties. These were the Nos. 3, 4, 6 and 7 types. Following the Washington conference in February 1924, the NAFEM appointed one of its members to represent it on Subcommittee 6. The recommendations of the NAFEM Committee were carefully reviewed by Subcommittee 6 and Standard BI8f — 1928 was prepared and subsequently issued.

Many of the non-standard types and variations of standard types continued to be used, one bolt manufacturer alone reporting production of 17 basic types with 54 variations in the head porportions of the No. 3 type, exclusive of diameter and legth.

In 1945, the Department of Commerce Simplified Practice Committee found that the Nos. 1, 2, 3, 4 and 7 bolts were the most widely used and the No. 6 bolt had little use. No dimensional standards existed for the No. 1 and No. 2. These findings were substantiated by a comprehensive survey conducted by the American Institute of Bolt, Nut, and Rivet Manufacturers who also found a limited requirement for the No. 8 head.

In June 1947, Subcommittee 6 was reorganized to study the problem and revise the Plow Bolt Standard. Sentiment in industry demanded simplification and the Subcommittee revised the dimensions of the No. 3 Round Head, Square Neck bolt and recommended its adoption as the standard Regular Head Plow Bolt for new designs in place of the Nos. 4, 6 and 7 Regular Head Bolts. They concluded that the No. 1 Protruding Key Head and the No. 8 Concave Head were special with each company, particularly the latter, where the head tops have the contours required by special usage. Use of the No. 1 was not considered necessary as standard keys are available and the No. 2 Countersunk Head was not included as it is available as a machine bolt.

The standard was considered in the light of expanding use of medium carbon and alloy steels and in railroad equipment, deep soil plows, cleaning machinery, tractors, corn cutters, manure spreaders, hay rakes, and implements of widely varied types.



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In the fall of 1947 a letter and a ballot were sent out to all known manufacturers and users of plow bolts to obtain comments on the proposed dimensions of the No. 3 head and a proposal to make it the sole standard for new designs. The comments received from over eighty percent of the circulation indicated favor of the proposals. The greatest demand of the dissenters was for inclusion of the No. 7 head. As a result, the Committee further revised the No. 3 and revised and restored the No. 7 head. It was decided to place the No. 4 regular head in an appendix, as the No. 3 and No. 7 head could be used in most cases. The same action was taken for the No. 6 regular head. The intent was to emphasize the use of No. 3 and No. 7 regular heads for new designs. The Nos. 3, 4, 6 and 7 repair heads were brought up to date and retained in the standard. Maximum and minimum limits were set for the square depth of the No. 3 and the "wash out" of the corners and bottoms of squares and keys were controlled by established radii. Without changing feed, head angles or head heights, and without changing head proportions, the relationship of the feed to the minimum head diameter was so set up that some feed will always, be available for grinding when the head diameter is at the minimum. The maximum head diameter was adjusted so that trimming the head may be optional if the feed is at the maximum and trimming is not specifically required.

Elimination of the $^{9}/_{16}$ in. size was considered but it was decided to include it with the comment "this size is not recommended".

Existing AISI plus and minus tolerances on hot rolled bar required the addition of a plus tolerance to the nominal bolt diameter in setting the maximum body diameter for the $^{9}/_{16}$ in. and larger sizes.

Thread lengths were limited by a maximum as well as a minimum. Due to wear, plow bolts function partly in shear and it was felt necessary to limit the number of threads in bearing.

The specification of one key width on all sizes of the No. 7 bead is indefensible from the standpoint of both usage and manufacture. To rectify this would cause tremendous confusion, as new bolts might not fit in the old holes and vice versa. If the corrected head was given a new head number this would also be confusing as it would be hard to distinguish from the No. 7 head now in production and use. As a result no solution was found practicable at this time.

A revised draft was submitted to industry for review, and every known manufacturer of plow bolts was invited to attend a meeting of the subcommittee in September 1948. Various objections were again reviewed and this proposal containing some refinements was unanimously approved by the subcommittee and submitted for letter ballot in June 1949. Following approval of the sectional committee and sponsor organizations. this proposal was presented to the American Standards Association for approval and designation as an American Standard. This was granted on March 22, 1950.

A revision of the American Standard Plow Bolts, B18.9-1950, submitted by the sponsors of project B18, was approved by the American Standards Association on February 12, 1958.

Subcommittee 9 was merged into Subcommittee 5 in 1977, and Subcommittee 5 was merged into Subcommittee 2 in December 1986. Committee B18 agreed the designations of the Subcommittee 2, 5 and 9 documents not be changed, since such changes would adversely affect current references to these Standards.

A proposed update revision of this Standard was circulated for letter ballot of Subcommittee 2 and Committee B18 on October 19, 1995, Following approval by Subcomittee 2 and Committee B18, this revision was approved by the secretariat and submitted to the American National Standards Institute for approval as an American National Standard. This was granted on May 7, 1996.



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# Standardization of Bolts, Nuts, Rivets, Screws, Washers, and Similar Fasteners

(The following is the roster of the Committee at the time of approval of this Standard.)

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# PLOW BOLTS (INCH SERIES)

## 1 INTRODUCTORY NOTES

### 1.1 Scope

**1.1.1** This Standard covers general and dimensional data for inch series plow bolts recognized as "American National Standard."

**1.1.2** The inclusion of dimensional data in this Standard is not intended to imply that all of the products described are stock production items. Consumers should consult with suppliers concerning the availability of products.

### 1.2 Head Types

**1.2.1** This Standard recommends Table 1, No. 3 square neck, 80 deg round countersunk head and Table 2, No. 7 reverse key, 60 deg round countersunk head plow bolts for new designs. It includes No. 3 square neck, round countersunk repair head; Table 3, No. 4 countersunk, square repair head; Table 4, No. 6 heavy key, round countersunk repair head; and No. 7 reverse key, round countersunk repair head plow bolts for service purposes.

**1.2.2** Dimensions of Table 3, No. 4 countersunk square regular head and Table 4, No. 6 heavy key, round countersunk regular head plow bolts are given in Appendix A, as information supplementary but not forming a part of this Standard.

### 1.3 Referenced Standards

Unless otherwise specified, the reference shall be to the most recent at the time of order placement.

ANSI standards may be obtained from ANSI, the American National Standards Institute, 11 West 42nd Street, New York, NY 10036-8002. Alternatively, ANSI or ASME B1, B18 or Y14 standards may be obtained from ASME, 22 Law Drive, Box 2300, Fairfield, NJ 07007-2300.

ASTM standards may be obtained from ASTM, the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

SAE standards may be obtained from SAE, the Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA 15096-0001.

### 1.4 Terminology

For definitions of terms relating to fasteners or component features thereof used in this Standard, refer to ANSI B18.12, Glossary of Terms for Mechanical Fasteners.

### 1.5 Dimensions

All dimensions in this Standard are given in inches unless otherwise stated.

Dimensioning and tolerancing in this Standard are in accord with ASME Y14.5M, Dimensioning and Tolerancing.

## 2 GENERAL DATA

### 2.1 Body Diameter

Bolt body diameters shall not exceed the maximum specified in the dimensions of Tables 1 through 4.

**2.1.1** Unless otherwise specified in the order by the purchaser, bolts which are not threaded full length shall be furnished with full diameter body within the limits specified in the dimensions tables.

On bolts which are threaded full length, the diameter of the unthreaded length under the head or neck shall not be less than the minimum pitch diameter of the thread.

**2.1.2** Bolts may be obtained with reduced diameter body. Where "reduced diameter body" is specified, the body diameter shall be neither less than the minimum pitch diameter of the thread nor greater than the minimum major diameter of the thread.

### 2.2 Length

**2.2.1** The length of a plow bolt is the overall distance from the end of the bolt to the top of the head. The recommended lengths of plow bolts are given in Table 5.



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**2.2.2** Tolerances on length of bolts are specified in the following table:

| Tolerance on Length | | |
|---|---|---|
| Nominal Dia<br>1/4 thru 3/8<br>0.250 thru 0.375 | Nominal Dia<br>7/16 and 1/2<br>0.4375 and 0.500 | Nominal Dia<br>9/16 thru 1<br>0.5625 thru 1.000 |
| ± 0.03 | ± 0.06 | ± 0.12 |

## 2.3 Threads

**2.3.1 Thread Series and Class.** Threads shall be Unified Coarse (UNC or UNRC Series), Class 2A, in accordance with ASME B1.1, Unified Inch Screw Threads (UN and UNR Thread Form).

**2.3.2 Thread Gaging.** Unless otherwise specified, dimensional acceptability of screw threads shall be determined based on System 21 of ASME B1.3M, Screw Thread Gaging Systems for Dimensional Acceptability — Inch and Metric Screw Threads (UN, UNR, UNJ, M and MJ).

## 2.4 Thread Length

The thread length is measured from the end of the bolt to the last complete (full form) thread. The minimum thread lengths are specified in Table 5. Tolerances on thread length are specified in Table 6.

## 2.5 Points

Plow bolts are not ordinarily pointed. If pointed, the point shall be chamfered or rounded at manufacturer's option from approximately 0.016 in below the minor diameter of the thread. The first full formed thread at major diameter shall be no greater than 2 times the thread pitch from the end of the bolt, as determined by the distance the point enters into a cylindrical NOT GO major diameter ring gage (ref. Gage 3.1, ASME B1.2).

## 2.6 Material and Mechanical Properties

**2.6.1 Steel.** Unless otherwise specified, chemical and mechanical properties of steel bolts shall conform to Grade A of ASTM A 307, Carbon Steel Bolts and Studs, 60 000 psi Tensile Strength; or to Grade 1 of SAE J429, Mechanical and Material Requirements of Externally Threaded Fasteners.

Cold-headed steel bolts of non-heat-treated grades shall be stress relieved.

**2.6.2 Other Materials.** Nonferrous materials are covered in ASTM F 468, Nonferrous Bolts, Hex Cap Screws, and Studs for General Use. Corrosion-resistant steels are covered in ASTM F 593, Stainless Steel Bolts, Hex Cap Screws, and Studs.

## 2.7 Identification Symbols

**2.7.1 Grade Symbols.** Each of the products included in this standard shall be marked in accordance with the requirements of the applicable specification for its material and mechanical properties.

**2.7.2 Source Symbols.** Each of the products included in this standard shall be marked to identify its source (manufacturer or private label distributor) in accordance with the requirements of the applicable specification for its material and mechanical properties.

## 2.8 Workmanship

Bolts shall be free from surface imperfections such as burrs, seams, laps, loose scale, and other surface irregularities which could affect their serviceability.

When control of surface discontinuities is required, the purchaser shall specify conformance to ASTM F 788/F 788M, Surface Discontinuities of Bolts, Screws, and Studs, Inch and Metric Series.

## 2.9 Finish

Unless otherwise specified, plow bolts shall be furnished with a natural (as processed) finish, unplated or uncoated.

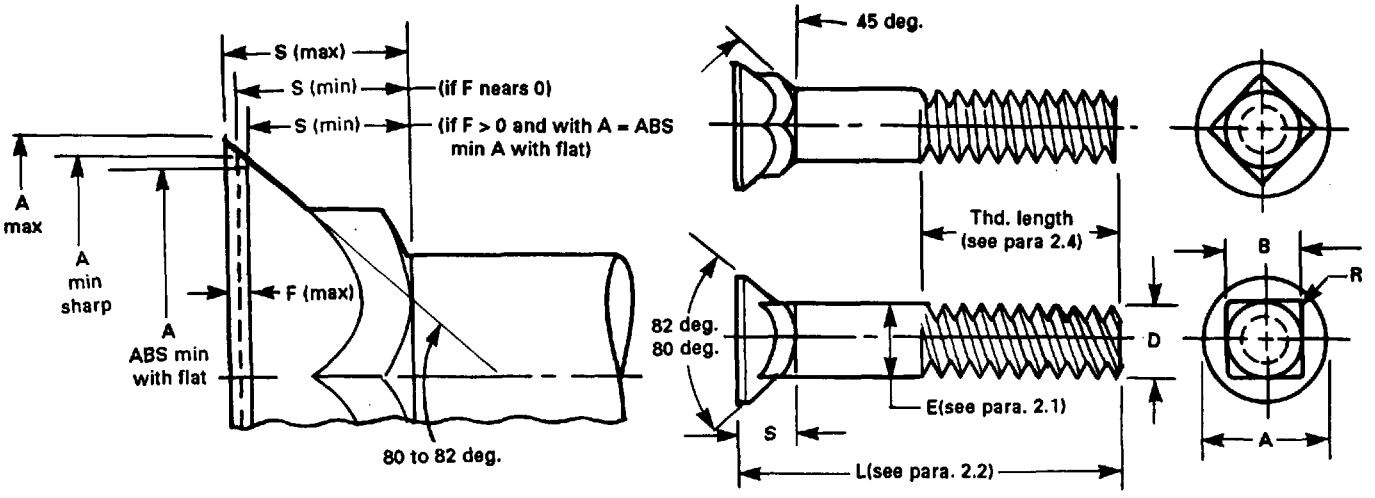
## 2.10 Inspection and Quality Assurance

Unless otherwise specified, acceptability of bolts shall be determined according to ASME B18.18.1M, Inspection and Quality Assurance for General Purpose Fasteners, with inspection level B for thread acceptability.



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## TABLE 1
## DIMENSIONS OF NO. 3 HEAD PLOW BOLTS (ROUND, COUNTERSUNK, SQUARE NECK)

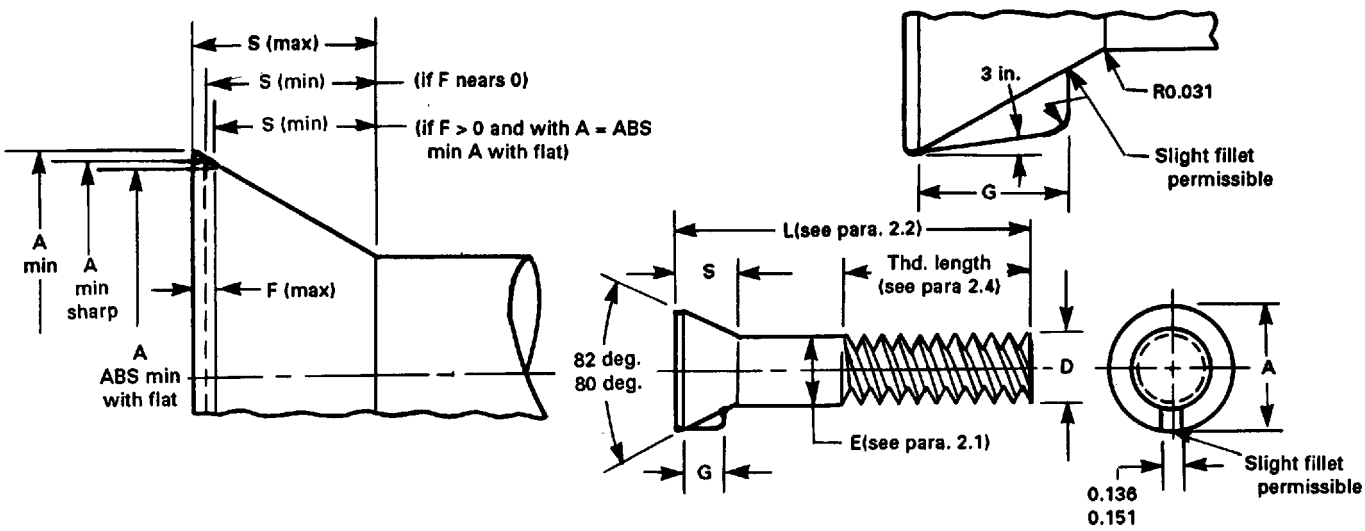
| Nominal or Basic Bolt Diameter[1] | D | E | | A | | | F | S | | B | | R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Diameter of Full Size Body | | Diameter of Head | | | Feed Thickness | Depth of Square and Head | | Width of Square | | Radius on Corners of Square |
| | | Max | Min | Max | Min Sharp | Abs Min With Flat | Max | Max | Min | Max | Min Basic | Max[2] |
| **REGULAR HEAD** | | | | | | | | | | | | |
| 5/16 | 0.3125 | 0.312 | 0.299 | 0.605 | 0.578 | 0.563 | 0.025 | 0.269 | 0.243 | 0.325 | 0.313 | 0.031 |
| 3/8 | 0.3750 | 0.375 | 0.360 | 0.708 | 0.671 | 0.656 | 0.031 | 0.312 | 0.281 | 0.387 | 0.375 | 0.047 |
| 7/16 | 0.4375 | 0.438 | 0.421 | 0.826 | 0.781 | 0.766 | 0.036 | 0.364 | 0.328 | 0.450 | 0.438 | 0.047 |
| 1/2 | 0.5000 | 0.500 | 0.483 | 0.945 | 0.890 | 0.875 | 0.042 | 0.417 | 0.375 | 0.515 | 0.500 | 0.047 |
| 9/16[3] | 0.5625[3] | 0.592 | 0.544 | 1.045 | 1.000 | 0.969 | 0.045 | 0.461 | 0.416 | 0.578 | 0.563 | 0.078 |
| 5/8 | 0.6250 | 0.657 | 0.606 | 1.147 | 1.094 | 1.063 | 0.050 | 0.506 | 0.456 | 0.640 | 0.625 | 0.078 |
| 3/4 | 0.7500 | 0.782 | 0.729 | 1.303 | 1.250 | 1.219 | 0.050 | 0.541 | 0.491 | 0.765 | 0.750 | 0.078 |
| 7/8 | 0.8750 | 0.938 | 0.853 | 1.512 | 1.469 | 1.406 | 0.063 | 0.626 | 0.563 | 0.906 | 0.875 | 0.094 |
| 1 | 1.0000 | 1.062 | 0.976 | 1.700 | 1.656 | 1.594 | 0.063 | 0.690 | 0.627 | 1.031 | 1.000 | 0.094 |
| **REPAIR HEAD[4]** | | | | | | | | | | | | |
| 5/16 | 0.3125 | 0.312 | 0.299 | 0.556 | 0.531 | 0.516 | 0.020 | 0.232 | 0.212 | 0.325 | 0.313 | 0.031 |
| 3/8 | 0.3750 | 0.375 | 0.360 | 0.659 | 0.624 | 0.609 | 0.025 | 0.272 | 0.247 | 0.387 | 0.375 | 0.047 |
| 7/16 | 0.4375 | 0.438 | 0.421 | 0.779 | 0.734 | 0.719 | 0.030 | 0.324 | 0.294 | 0.450 | 0.438 | 0.047 |
| 1/2 | 0.5000 | 0.500 | 0.483 | 0.898 | 0.843 | 1.828 | 0.035 | 0.375 | 0.340 | 0.515 | 0.500 | 0.047 |
| 9/16 | 0.5625 | 0.592 | 0.544 | 1.002 | 0.953 | 0.922 | 0.040 | 0.423 | 0.383 | 0.578 | 0.563 | 0.078 |
| 5/8 | 0.6250 | 0.657 | 0.606 | 1.096 | 1.047 | 1.016 | 0.040 | 0.458 | 0.418 | 0.640 | 0.625 | 0.078 |
| 3/4 | 0.7500 | 0.782 | 0.729 | 1.252 | 1.203 | 1.172 | 0.040 | 0.493 | 0.453 | 0.765 | 0.750 | 0.078 |
| 7/8 | 0.8750 | 0.938 | 0.853 | 1.465 | 1.422 | 1.359 | 0.050 | 0.573 | 0.523 | 0.906 | 0.875 | 0.094 |
| 1 | 1.0000 | 1.062 | 0.976 | 1.653 | 1.609 | 1.547 | 0.050 | 0.637 | 0.587 | 1.031 | 1.000 | 0.094 |

GENERAL NOTE: For additional requirements refer to Section 2 General Data.

NOTES:
(1) Where specifying the nominal size in decimals, zeros preceding the decimal and in the fourth decimal place shall be omitted.
(2) If the method of manufacture permits, it is recommended that the same radius be maintained on each of all four corners of the square.
(3) This size is not recommended.
(4) The letter "R" shall be shown on top of the repair head, to distinguish it from the regular head bolt.



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## TABLE 2
## DIMENSIONS OF NO. 7 HEAD PLOW BOLTS (ROUND, COUNTERSUNK, REVERSE KEY)

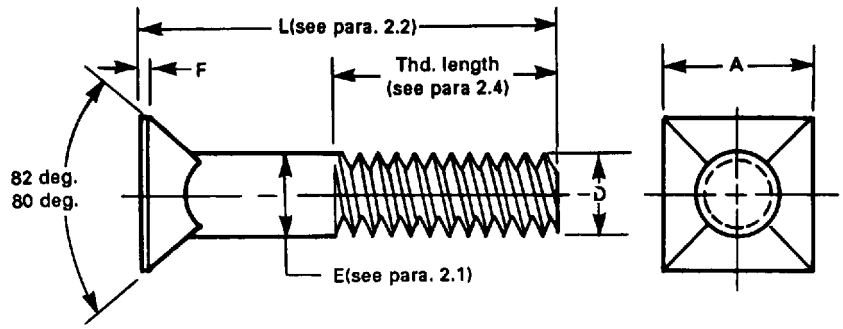
| D | | E | | A | | | F | S | | G | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Diameter of Full Size Body | | Diameter of Head | | | Feed Thickness | Head Height | | Key Length | |
| Nominal or Basic Bolt Diameter[1] | | Min | Max | Max | Min Sharp | Abs Min With Flat | Max | Max | Min | Min | Max |
| **REGULAR HEAD** | | | | | | | | | | | |
| 5/16 | 0.3125 | 0.312 | 0.299 | 0.592 | 0.578 | 0.563 | 0.025 | 0.233 | 0.208 | 0.185 | 0.200 |
| 3/8 | 0.3750 | 0.375 | 0.360 | 0.661 | 0.640 | 0.625 | 0.031 | 0.239 | 0.208 | 0.187 | 0.202 |
| 7/16 | 0.4375 | 0.438 | 0.421 | 0.776 | 0.749 | 0.734 | 0.036 | 0.282 | 0.246 | 0.227 | 0.242 |
| 1/2 | 0.5000 | 0.500 | 0.483 | 0.892 | 0.859 | 0.844 | 0.042 | 0.328 | 0.286 | 0.267 | 0.282 |
| 9/16[2] | 0.5625[2] | 0.592 | 0.544 | 1.021 | 0.984 | 0.969 | 0.045 | 0.383 | 0.388 | 0.321 | 0.336 |
| 5/8 | 0.6250 | 0.657 | 0.606 | 1.121 | 1.078 | 1.063 | 0.050 | 0.414 | 0.364 | 0.348 | 0.363 |
| 3/4 | 0.7500 | 0.782 | 0.729 | 1.277 | 1.234 | 1.219 | 0.050 | 0.440 | 0.390 | 0.375 | 0.390 |
| **REPAIR HEAD[3]** | | | | | | | | | | | |
| 5/16 | 0.3125 | 0.312 | 0.299 | 0.554 | 0.546 | 0.531 | 0.020 | 0.201 | 0.181 | 0.158 | 0.173 |
| 3/8 | 0.3750 | 0.375 | 0.360 | 0.623 | 0.609 | 0.594 | 0.025 | 0.207 | 0.182 | 0.158 | 0.173 |
| 7/16 | 0.4375 | 0.438 | 0.421 | 0.738 | 0.718 | 0.703 | 0.030 | 0.250 | 0.220 | 0.199 | 0.214 |
| 1/2 | 0.5000 | 0.500 | 0.483 | 0.853 | 0.828 | 0.813 | 0.035 | 0.295 | 0.260 | 0.239 | 0.254 |
| 9/16 | 0.5625 | 0.592 | 0.544 | 0.984 | 0.953 | 0.938 | 0.040 | 0.352 | 0.312 | 0.293 | 0.308 |
| 5/8 | 0.6250 | 0.657 | 0.606 | 1.077 | 1.046 | 1.301 | 0.040 | 0.378 | 0.338 | 0.321 | 0.336 |
| 3/4 | 0.7500 | 0.782 | 0.729 | 1.234 | 1.230 | 1.188 | 0.040 | 0.404 | 0.364 | 0.347 | 0.362 |

GENERAL NOTE: For additional requirements refer to Section 2 General Data.

NOTES:
(1) Where specifying the nominal size in decimals, zeros preceding the decimal and in the fourth decimal place shall be omitted.
(2) This size is not recommended.
(3) The letter "R" shall be shown on top of the repair head, to distinguish it from the regular head bolt.



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## TABLE 3
## DIMENSIONS OF NO. 4 REPAIR HEAD[1] PLOW BOLTS
## (SQUARE HEAD, COUNTERSUNK)

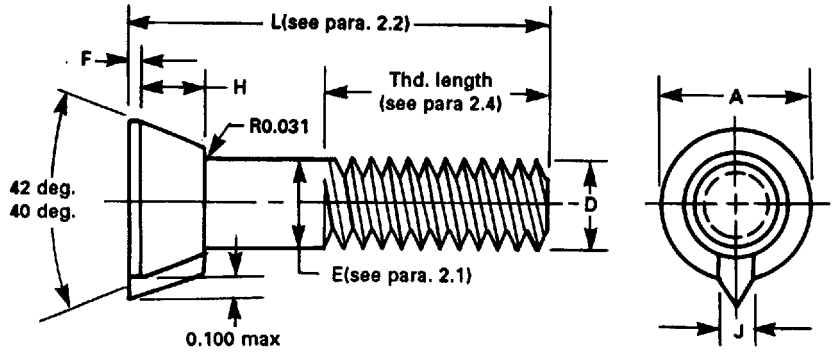
| D | | E | | A | | | F |
|---|---|---|---|---|---|---|---|
| Nominal or Basic Bolt Diameter[2] | | Diameter of Full Size Body | | Width of Head | | | Feed Thickness |
| | | Max | Min | (Basic) | Min | Max | Max |
| 5/16 | 0.3125 | 0.312 | 0.299 | 33/64 | 0.516 | 0.531 | 0.020 |
| 3/8 | 0.3750 | 0.375 | 0.360 | 41/64 | 0.641 | 0.656 | 0.025 |
| 7/16 | 0.4375 | 0.438 | 0.421 | 45/64 | 0.703 | 0.718 | 0.030 |
| 1/2 | 0.5000 | 0.500 | 0.438 | 49/64 | 0.766 | 0.781 | 0.035 |
| 9/16 | 0.5625 | 0.592 | 0.544 | 57/64 | 0.891 | 0.922 | 0.040 |
| 5/8 | 0.6250 | 0.657 | 0.606 | 61/64 | 0.953 | 0.984 | 0.040 |
| 3/4 | 0.7500 | 0.782 | 0.729 | 1 5/64 | 1.078 | 1.109 | 0.040 |
| 7/8 | 0.8750 | 0.938 | 0.853 | 1 17/64 | 1.266 | 1.297 | 0.040 |
| 1 | 1.0000 | 1.062 | 0.976 | 1 29/64 | 1.453 | 1.484 | 0.040 |

GENERAL NOTE: For additional requirements refer to Section 2 General Data.

NOTES:
(1) The letter "R" shall be shown on top of the repair head, to distinguish it from the regular head bolt.
(2) Where specifying the nominal size in decimals, zeros preceding the decimal and in the fourth decimal place shall be omitted.



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## TABLE 4
## DIMENSIONS OF NO. 6 REPAIR HEAD[1] PLOW BOLTS
## (ROUND, COUNTERSUNK, HEAVY KEY)

| D | | E | | A | | F | H | J |
|---|---|---|---|---|---|---|---|---|
| Nominal or Basic Bolt Diameter[2] | | Diameter of Full Size Body | | Diameter of Head | | Feed Thickness | Height of Head | Key Width |
| | | Max | Min | Minimum (Basic) | Max | Max | Max | Max |
| 3/8 | 0.3750 | 0.375 | 0.360 | 0.708 | 0.723 | 0.025 | 0.286 | 0.156 |
| 7/16 | 0.4375 | 0.438 | 0.421 | 0.770 | 0.785 | 0.030 | 0.339 | 0.172 |
| 1/2 | 0.5000 | 0.500 | 0.483 | 0.836 | 0.851 | 0.035 | 0.402 | 0.188 |

GENERAL NOTE: For additional requirements refer to Section 2 General Data.

NOTES:
(1) The letter "R" shall be shown on top of the repair head, to distinguish it from the regular head bolt.
(2) Where specifying the nominal size in decimals, zeros preceding the decimal and in the fourth decimal place shall be omitted.



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## TABLE 5
## MINIMUM THREAD LENGTHS OF PLOW BOLTS (2D + 0.25)[1]

| Recommended Bolt Length[2] L | | Nominal Bolt Diameter, D | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 5/16 0.3125 | 3/8 0.375 | 7/16 0.4375 | 1/2 0.500 | 9/16[3] 0.5625[3] | 5/8 0.625 | 3/4 0.750 | 7/8 0.875 | 1 1.000 |
| 3/4 | 0.75 | T to H | T to H | T to H | T to H | T to H | T to H | T to H | T to H | T to H |
| 1 | 1.00 | T to H | T to H | T to H | T to H | T to H | T to H | T to H | T to H | T to H |
| 1 1/4 | 1.25 | 0.875 | T to H | T to H | T to H | T to H | T to H | T to H | T to H | T to H |
| 1 1/2 | 1.50 | 0.875 | 1.000 | T to H | T to H | T to H | T to H | T to H | T to H | T to H |
| 1 3/4 | 1.75 | 0.875 | 1.000 | 1.125 | 1.250 | T to H | T to H | T to H | T to H | T to H |
| 2 | 2.00 | 0.875 | 1.000 | 1.125 | 1.250 | 1.375 | T to H | T to H | T to H | T to H |
| 2 1/4 | 2.25 | 0.875 | 1.000 | 1.125 | 1.250 | 1.375 | 1.500 | T to H | T to H | T to H |
| 2 1/2 | 2.50 | 0.875 | 1.000 | 1.125 | 1.250 | 1.375 | 1.500 | 1.750 | T to H | T to H |
| 2 3/4 | 2.75 | 0.875 | 1.000 | 1.125 | 1.250 | 1.375 | 1.500 | 1.750 | 2.000 | T to H |
| 3 | 3.00 | 0.875 | 1.000 | 1.125 | 1.250 | 1.375 | 1.500 | 1.750 | 2.000 | 2.250 |
| 3 1/4 | 3.25 | 0.875 | 1.000 | 1.125 | 1.250 | 1.375 | 1.500 | 1.750 | 2.000 | 2.250 |
| 3 1/2 | 3.50 | 0.875 | 1.000 | 1.125 | 1.250 | 1.375 | 1.500 | 1.750 | 2.000 | 2.250 |
| 3 3/4 | 3.75 | 0.875 | 1.000 | 1.125 | 1.250 | 1.375 | 1.500 | 1.750 | 2.000 | 2.250 |
| 4 | 4.00 | 0.875 | 1.000 | 1.125 | 1.250 | 1.375 | 1.500 | 1.750 | 2.000 | 2.250 |
| 4 1/4 | 4.25 | 0.875 | 1.000 | 1.125 | 1.250 | 1.375 | 1.500 | 1.750 | 2.000 | 2.250 |
| 4 1/2 | 4.50 | 0.875 | 1.000 | 1.125 | 1.250 | 1.375 | 1.500 | 1.750 | 2.000 | 2.250 |
| 4 3/4 | 4.75 | 0.875 | 1.000 | 1.125 | 1.250 | 1.375 | 1.500 | 1.750 | 2.000 | 2.250 |
| 5 | 5.00 | 0.875 | 1.000 | 1.125 | 1.250 | 1.375 | 1.500 | 1.750 | 2.000 | 2.250 |
| 5 1/4 | 5.25 | 0.875 | 1.000 | 1.125 | 1.250 | 1.375 | 1.500 | 1.750 | 2.000 | 2.250 |
| 5 1/2 | 5.50 | 0.875 | 1.000 | 1.125 | 1.250 | 1.375 | 1.500 | 1.750 | 2.000 | 2.250 |
| 5 3/4 | 5.75 | 0.875 | 1.000 | 1.125 | 1.250 | 1.375 | 1.500 | 1.750 | 2.000 | 2.250 |
| 6 | 6.00 | 0.875 | 1.000 | 1.125 | 1.250 | 1.375 | 1.500 | 1.750 | 2.000 | 2.250 |

NOTES:
(1) T to H means threaded to head or square within 2 1/2 full threads.
(2) Short lengths shown above the solid stepped line are not recommended.
(3) This size is not recommended for regular head bolts.

## TABLE 6
## PLUS TOLERANCE ON THREAD LENGTH

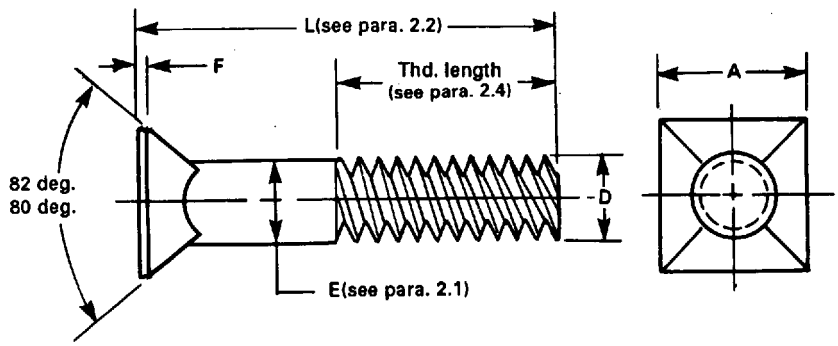
| Nominal Diameter, D | | Tolerance Plus |
|---|---|---|
| 5/16 | 0.3125 | 0.139 |
| 3/8 | 0.375 | 0.156 |
| 7/16 | 0.4375 | 0.179 |
| 1/2 | 0.500 | 0.192 |
| 9/16 | 0.5625 | 0.208 |
| 5/8 | 0.625 | 0.227 |
| 3/4 | 0.750 | 0.250 |
| 7/8 | 0.875 | 0.278 |
| 1 | 1.000 | 0.312 |



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# APPENDIX A

(This Appendix shows the dimensions of Table A1, No. 4 and Table A2, No. 6 regular head plow bolts as supplementary information and not as part of this Standard. For new designs, it is recommended that preference be given to Table 1, No. 3 or Table 2, No. 7 head plow bolts.)




## TABLE A1
## DIMENSIONS OF NO. 4 REGULAR HEAD PLOW BOLTS
## (SQUARE HEAD, COUNTERSUNK)

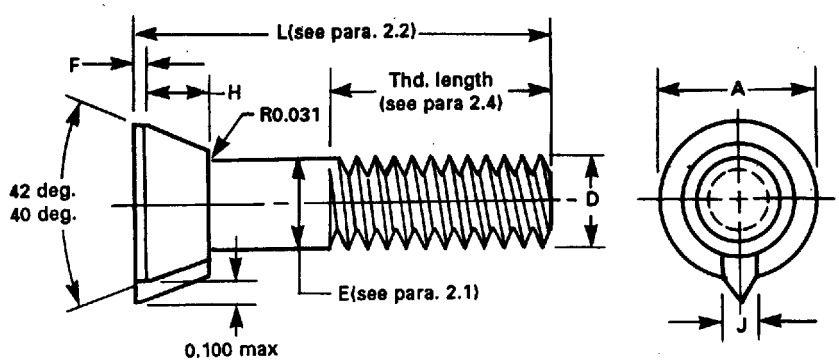
| D | | E | | A | | | F |
|---|---|---|---|---|---|---|---|
| Nominal or Basic Bolt Diameter[1] | | Diameter of Full Size Body | | Width of Head | | | Feed Thickness |
| | | Max | Min | (Basic) | Min | Max | Max |
| 5/16 | 0.3125 | 0.312 | 0.299 | 9/16 | 0.563 | 0.578 | 0.025 |
| 3/8 | 0.3750 | 0.375 | 0.360 | 1 1/16 | 0.688 | 0.703 | 0.031 |
| 7/16 | 0.4375 | 0.438 | 0.421 | 3/4 | 0.750 | 0.765 | 0.036 |
| 1/2 | 0.5000 | 0.500 | 0.438 | 13/16 | 0.813 | 0.828 | 0.042 |
| 9/16 | 0.5625 | 0.592 | 0.544 | 15/16 | 0.969 | 0.969 | 0.045 |
| 5/8 | 0.6250 | 0.657 | 0.606 | 1 | 1.000 | 1.031 | 0.050 |
| 3/4 | 0.7500 | 0.782 | 0.729 | 1 1/8 | 1.125 | 1.156 | 0.050 |
| 7/8 | 0.8750 | 0.938 | 0.853 | 1 5/16 | 1.313 | 1.344 | 0.050 |
| 1 | 1.0000 | 1.062 | 0.976 | 1 1/2 | 1.500 | 1.531 | 0.050 |

GENERAL NOTE: For additional requirements refer to Section 2 General Data.

NOTES:
(1) Where specifying the nominal size in decimals, zeros preceding the decimal and in the fourth decimal place shall be omitted.



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## TABLE A2
## DIMENSIONS OF NO. 6 REGULAR HEAD PLOW BOLTS
## (ROUND, COUNTERSUNK, HEAVY KEY)

| D | | E | | A | | H | J |
|---|---|---|---|---|---|---|---|
| | | Diameter of Full Size Body | | Diameter of Head | | Height of Head | Key Width |
| Nominal or Basic Bolt Diameter[1] | | Max | Min | Minimum (Basic) | Max | Max | Max |
| 3/8 | 0.3750 | 0.375 | 0.360 | 0.725 | 0.740 | 0.310 | 0.156 |
| 7/16 | 0.4375 | 0.438 | 0.421 | 0.796 | 0.811 | 0.367 | 0.172 |
| 1/2 | 0.5000 | 0.500 | 0.483 | 0.867 | 0.882 | 0.430 | 0.188 |

GENERAL NOTE: For additional requirements refer to Section 2 General Data.

NOTE:
(1) Where specifying the nominal size in decimals, zeros preceding the decimal and in the fourth decimal place shall be omitted.



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## AMERICAN NATIONAL STANDARDS FOR BOLTS, NUTS, RIVETS, SCREWS, WASHERS, AND SIMILAR FASTENERS

Small Solid Rivets ..... B18.1.1-1972(R1995)
Large Rivets ..... B18.1.2-1972(R1995)
Metric Small Solid Rivets ..... B18.1.3M-1983(R1995)
Square and Hex Bolts and Screws (Inch Series) ..... B18.2.1-1996
Square and Hex Nuts (Inch Series) ..... B18.2.2-1987(R1993)
Metric Hex Cap Screws ..... B18.2.3.1M-1979(R1995)
Metric Formed Hex Screws ..... B18.2.3.2M-1979(R1995)
Metric Heavy Hex Screws ..... B18.2.3.3M-1979(R1995)
Metric Hex Flange Screws ..... B18.2.3.4M-1984(R1995)
Metric Hex Bolts ..... B18.2.3.5M-1979(R1995)
Metric Heavy Hex Bolts ..... B18.2.3.6M-1979(R1995)
Metric Heavy Hex Structural Bolts ..... B18.2.3.7M-1979(R1995)
Metric Hex Lag Screws ..... B18.2.3.8M-1981(R1991)
Metric Heavy Hex Flange Screws ..... B18.2.3.9M-1984(R1995)
Square Head Bolts (Metric Series) ..... B18.2.3.10M-1996
Metric Hex Nuts, Style 1 ..... B18.2.4.1M-1996
Metric Hex Nuts, Style 2 ..... B18.2.4.2M-1979(R1995)
Metric Slotted Hex Nuts ..... B18.2.4.3M-1979(R1995)
Metric Hex Flange Nuts ..... B18.4.4.4M-1982(R1993)
Metric Hex Jam Nuts ..... B18.2.4.5M-1979(R1990)
Metric Heavy Hex Nuts ..... B18.2.4.6M-1979(R1990)
Fasteners for Use in Structural Applications ..... B18.2.6-1996
Socket Cap, Shoulder and Set Screws — Inch Series ..... B18.3-1986(R1995)
Socket Head Cap Screws (Metric Series) ..... B18.3.1M-1986(R1993)
Metric Series Hexagon Keys and Bits ..... B18.3.2M-1979(R1990)
Hexagon Socket Head Shoulder Screws (Metric Series) ..... B18.3.3M-1986(R1993)
Hexagon Socket Button Head Cap Screws (Metric Series) ..... B18.3.4M-1986(R1993)
Hexagon Socket Flat Countersunk Head Cap Screws (Metric Series) ..... B18.3.5M-1986(R1993)
Metric Series Socket Set Screws ..... B18.3.6M-1986(R1993)
Round Head Bolts (Inch Series) ..... B18.5-1990
Metric Round Head Short Square Neck Bolts ..... B18.5.2.1M-1996
Metric Round Head Square Neck Bolts ..... B18.5.2.2M-1982
Round Head Square Neck Bolts With Large Head (Metric Series) ..... B18.5.2.3M-1990
Wood Screws (Inch Series) ..... B18.6.1-1981(R1991)
Slotted Head Cap Screws, Square Head Set Screws, and Slotted Headless Set Screws ..... B18.6.2-1972(R1993)
Machine Screws and Machine Screw Nuts ..... B18.6.3-1972(R1983)
Thread Forming and Thread Cutting Tapping Screws and Metallic Drive Screws (Inch Series) ..... B18.6.4-1981(R1991)
Metric Thread Forming and Thread Cutting Tapping Screws ..... B18.6.5M-1986(R1993)
Metric Machine Screws ..... B18.6.7M-1985(R1993)
General Purpose Semi-Tubular Rivets, Full Tubular Rivets, Split Rivets and Rivet Caps ..... B18.7-1972(R1992)
Metric General Purpose Semi-Tubular Rivets ..... B18.7.1M-1984(R1992)
Clevis Pins and Cotter Pins (Inch Series) ..... B18.8.1-1994
Taper Pins, Dowel Pins, Straight Pins, Grooved Pins, and Spring Pins (Inch Series) ..... B18.8.2-1995
Spring Pins — Coiled Type (Metric Series) ..... B18.8.3M-1995
Spring Pins — Slotted (Metric Series) ..... B18.8.4M-1994
Machine Dowel Pins — Hardened Ground (Metric Series) ..... B18.8.5M-1994
Cotter Pins (Metric Series) ..... B18.8.6M-1995
Headless Clevis Pins (Metric Series) ..... B18.8.7M-1994
Headed Clevis Pins (Metric Series) ..... B18.8.8M-1994
Plow Bolts (Inch Series) ..... B18.9-1996
Track Bolts and Nuts ..... B18.10-1982(R1992)
Miniature Screws ..... B18.11-1961(R1992)
Glossary of Terms for Mechanical Fasteners ..... B18.12-1962(R1991)
Screw and Washer Assemblies — Sems (Inch Series) ..... B18.13-1987(R1993)
Screw and Washer Assemblies — Sems (Metric Series) ..... B18.13.1M-1991
Forged Eyebolts ..... B18.15-1985(R1995)
Mechanical and Performance Requirements for Prevailing-Torque Type Steel Metric Hex Nuts and Hex Flange Nuts ..... B18.16.1M-1979(R1995)
Torque-Tension Test Requirements for Prevailing-Torque Type Steel Metric Hex Nuts and Hex Flange Nuts ..... B18.16.2M-1979(R1995)

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Dimensional Requirements for Prevailing-Torque Type Steel
Metric Hex Nuts and Hex Flange Nuts ..... B18.16.3M-1982(R1993)
Wing Nuts, Thumb Screws, and Wing Screws ..... B18.17-1968(R1983)
Inspection and Quality Assurance for General Purpose Fasteners ..... B18.18.1M-1987(R1993)
Inspection and Quality Assurance for High-Volume Machine Assembly Fasteners ..... B18.18.2M-1987(R1993)
Inspection and Quality Assurance for Special Purpose Fasteners ..... B18.18.3M-1987(R1993)
Inspection and Quality Assurance for Fasteners for Highly Specialized
Engineered Applications ..... B18.18.4M-1987(R1993)
Lock Washers (Inch Series) ..... B18.21.1-1994
Lock Washers (Metric Series) ..... B18.21.2M-1994
Metric Plain Washers ..... B18.22M-1981(R1990)
Plain Washers ..... B18.22.1-1965(R1990)
Part Identifying Number (Pin) Code System Standard for B18 Externally
Threaded Products ..... B18.24.1-1996
Square and Rectangular Keys and Keyways ..... B18.25.1M-1996
Woodruff Keys and Keyways ..... B18.25.2M-1996
Helical Coil Screw Thread Inserts (Inch Series) ..... B18.29.1-1993

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