ASME B18.6.3–2003
(Revision of ASME B18.6.3-1998)

Machine Screws and Machine Screw Nuts

AN AMERICAN NATIONAL STANDARD



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FOREWORD

American National Standards Committee B18 for the standardization of bolts, screws, nuts, rivets, and similar fasteners was organized in March 1922, as Sectional Committee B18 under the aegis of the American Engineering Standards Committee (later the American Standards Association, then 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. Subcommittee 3[1] was subsequently established and charged with the responsibility for technical content of standards covering slotted and recessed head screws.

An American Standard setting forth slotted head proportions was approved and published in April of 1930. Over the years following the Issuance of this document, the need for standards more comprehensive than head configurations became apparent. At a meeting held on April 14, 1942, Subcommittee 3[1] was reorganized and enlarged, and the following operating scope was established:

The scope of Subcommittee 3[1] shall consist of the development and promulgation of American Standards embracing screw products variously known as machine screws, wood screws, tapping screws, slotted head cap screws, slotted headless set screws, and machine screw nuts. The standards shall comprise complete product standards covering all dimensions and tolerances required for the specification and production of the products. Details shall include boundary dimensions, such as nut width and thickness; screw head dimensions; slot and recess dimensions; body dimensions; thread classification or thread detail, as required; thread length; point design; chamfers; underhead fillets; and supporting general specifications covering the quality, finish, and the acceptable tolerances and limits as well as any information that may be necessary to insure satisfactory application of the products.

Several meetings of the Subcommittee over the ensuing 3 years resulted in the development and acceptance of a proposed revision containing complete product standards coverage for slotted and recessed head machine, tapping and wood screws; slotted head and hexagon head cap screws; and slotted headless set screws. Following approval by the B18 Committee and sponsor organizations, this proposal was forwarded to the American Standards Association and declared an American Standard, ASA B18.6, on April 12, 1947.

Recognizing the need for further refinements, Subcommittee 3[1] at a meeting held on February 1, 1951, established three standing working subgroups: one to develop details pertinent to tapping screw threads; a second to review, revise, and develop head dimensions and tolerances; and a third to correlate and edit the technical information emanating from the other two groups. Also at this meeting, numerous suggested changes were reviewed and assigned to the respective subgroups for further development. Additional meetings of the Subcommittee were held on October 9, 1952, October 29, 1953, and April 1 and 2, 1954. Between each of these meetings the subgroups held numerous working sessions and carried on technical development in cooperation with the technical committees of the U.S. Machine Screw and Tapping Screw Service Bureaus.

At the April 1954 meeting, Subcommittee 3,[1] contemplating a partial revision of the ASA B18.6 document, recommended the publication of standards for wood screws, cap and set screws, machine screws, and tapping and drive screws in four separate documents, each of which would consist of a complete product specification. This approach was confirmed by the B18 Committee with the further stipulation that the coverage for hexagon head cap screws, square head set screws, and machine screw nuts from the ASA B18.2 standard be transferred to the documents covering cap and set screws and machine screws, respectively. It was understood that jurisdiction over the square head set screws and hexagon head cap screws would remain with Subcommittee 2 and that Subcommittee 3[1] would retain responsibility for machine screw nuts. Following this confirmation and additional direction, the preparation of proposals for the new documents was undertaken.

The proposed standard covering slotted and recessed head machine screws and machine screw nuts was approved by Subcommittee 3[1] at a meeting held on December 6, 1955. After being circulated to industry for comment, it was revised and subsequently approved by letter ballot of the B18 Committee in March of 1958. The proposal was, however, redrafted to incorporate additional revisions and refinements adopted by Subcommittee 3[1] at meetings held on October 30, 1958 and September 17, 1959. The revised proposal was recirculated to the B18 Committee and was approved by the sponsor organizations and the American Standards Association and formally designated an American Standard, ASA B18.6.3, on February 12, 1962.

[1] As of April 1, 1966, Subcommittee 3 was redesignated Subcommittee 6.

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Following issuance of the 1962 document, Subcommittee 3[1] and the working subgroups continued to develop revisions and refinements reflecting changes in industry practices and technical improvements. Work over the intervening years culminated in the Subcommittee 6 acceptance of a draft dated November 1969, incorporating revisions in the following areas: inclusion of Type IA cross recess data; addition of the No. 0000, 000, and 00 sizes to most slotted head styles; extensions of size coverage for 100 deg flat countersunk heads and binding heads in smaller sizes, and for pan heads in larger sizes; redimensioning of flat and oval countersunk heads; revision of thread lengths; inclusion of appendices for wobble gaging of recessed heads and wrench sizes for square and hex products; and a complete revamping of the format.

This revision was approved as an American National Standard on May 22, 2003.

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ASME B18 COMMITTEE
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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The Committee welcomes proposals for revisions to this Standard. Such proposals should be as specific as possible, citing the paragraph number(s), the proposed wording, and a detailed description of the reasons for the proposal, including any pertinent documentation.

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The request for interpretation should be clear and unambiguous. It is further recommended that the inquirer submit his/her request in the following format:

Subject:	Cite the applicable paragraph number(s) and the topic of the inquiry.
Edition:	Cite the applicable edition of the Standard for which the interpretation is being requested.
Question:	Phrase the question as a request for an interpretation of a specific requirement suitable for general understanding and use, not as a request for an approval of a proprietary design or situation. The inquirer may also include any plans or drawings, which are necessary to explain the question; however, they should not contain proprietary names or information.

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MACHINE SCREWS AND MACHINE SCREW NUTS

1 INTRODUCTORY NOTES

1.1 Scope

This Standard is intended to cover the complete general and dimensional data for the various types of slotted and recessed head machine screws and machine screw nuts recognized as American National Standard. Also included are appendices that provide specifications and instructions for the protrusion gaging of flat countersunk head screws; across-corners gaging of hex head screws; penetration gaging and wobble gaging of recessed head screws; wrench openings for hex and square products; thread dimensions for the No. 0000, No. 000, and No. 00 sizes; and formulas on which dimensional data are based. It shall be understood, however, that where questions arise concerning acceptance of product, the dimensions in the tables shall govern over recalculation by formula.

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

1.2 Machine Screw Head Types

The head types covered by this Standard include those commonly recognized as being applicable to machine screws and are enumerated and described in the following paragraphs.

1.2.1 Flat Countersunk Head. The flat countersunk head has a flat top surface and a conical bearing surface with a head angle for one style of approximately 82 deg and for another style of approximately 100 deg. Dimensions are given in Tables 1A through 1E, and 2A through 2D, respectively. Dimensions of close tolerance 100 deg flat countersunk heads are given in Tables 3A through 3D.

1.2.2 Oval Countersunk Head. The oval countersunk head has a rounded top surface and a conical bearing surface with a head angle of approximately 82 deg. Dimensions are given in Tables 4A through 4E.

1.2.3 Undercut Flat and Oval Countersunk Heads. For short lengths, 82 deg flat and oval countersunk head machine screws have heads undercut to 70% of normal side height to afford greater length of thread on the screws. Dimensions are given in Tables 5A through 5E, and 6A through 6E, respectively.

1.2.4 Flat and Oval Countersunk Trim Heads. Flat and oval countersunk trim heads are similar to the 82 deg flat and oval countersunk heads except that the size of head for a given size screw is one or two sizes smaller than the regular flat and oval countersunk head size, and oval countersunk trim heads have a controlled radius where the curved top surface meets the conical bearing surface. Trim heads are furnished only in cross recessed head types. Dimensions are given in Tables 7A through 7C, and 8A through 8C, respectively.

1.2.5 Pan Head. The slotted pan head has a flat top surface rounded into cylindrical sides and a flat bearing surface. The recessed pan head has a rounded top surface blending into cylindrical sides and a flat bearing surface. Dimensions are given in Tables 9A through 9H.

1.2.6 Fillister Head. The fillister head has a rounded top surface, cylindrical sides, and a flat bearing surface. Dimensions are given in Tables 10A through 10E. Dimensions of drilled fillister head machine screws are given in Table 11.

1.2.7 Truss Head. The truss head has a low rounded top surface with a flat bearing surface, the diameter of which for a given screw size is larger than the diameter of the corresponding pan head. Dimensions are given in Tables 12A through 12G.

1.2.8 Binding Head. The binding head has a rounded top surface and slightly tapered sides. The bearing surface is flat and, where so specified by purchaser, slotted heads shall have an annular undercut adjacent to the shank. Dimensions are given in Tables 13A through 13E.

1.2.9 Hex Head. The hex head has a flat or indented top surface, six flat sides, and a flat bearing surface. Dimensions for regular and large heads are given in Tables 14A through 14C.

1.2.10 Hex Washer Head. The hex washer head has an indented top surface and six flat sides formed integrally with a flat washer that projects beyond the sides and provides a flat bearing surface. Dimensions are given in Tables 15A through 15C.

1.2.11 Round Head. The round head has a semielliptical top surface and a flat bearing surface. In recognition of superior slot driving characteristics of pan head screws over round head screws, and the overlap in the dimensions of cross recessed pan heads and round heads, it is recommended that pan head screws be used

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in new designs and wherever possible substituted in existing designs. To expedite elimination of the necessity for perpetuating stocks of finished products and tooling, it should be recognized that during the transition period manufacturers may, when it is agreeable to users, substitute pan head where round head is specified. Dimensions of round head machine screws are given in Tables 16A through 16G.

1.2.12 Round Washer Head. The round washer head has a semielliptical top surface formed integrally with a flat washer that projects beyond the crown of the head and provides a flat bearing surface. Dimensions are given in Tables 17A and 17B.

1.3 Machine Screw Nuts

The machine screw nuts covered by this Standard include the hexagon and square varieties. Dimensions are given in Table 18.

1.4 Dimensions

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

1.5 Options

Options, where specified, shall be at the discretion of the manufacturer unless otherwise agreed upon by the manufacturer and the purchaser.

1.6 Responsibility for Modification

The manufacturer shall not be held responsible for malfunctions of product determined to be due to plating or other modifications when such plating or modification is not accomplished under the manufacturer's control or direction.

1.7 Terminology

For definitions of terms relating to fasteners or features thereof used in this Standard, refer to ASME B18.12.

1.8 Related Standards

It should be noted that standards for cap screws, set screws, tapping screws, wood screws, drive screws, sems, washers, and other related fasteners are published under separate cover as listed at the end of this Standard.

1.9 Comparison With ISO

This Standard has no ISO counterpart.

1.10 Inspection and Quality Assurance

Unless otherwise specified, acceptability to this Standard shall be determined in accordance with ASME B18.18.1.

When applicable, the following designated characteristics shall be inspected to the inspection levels shown according to ASME B18.18.2 and shall be within their specified limits.

Designated Characteristic	Inspection Level
Recess penetration depth	C
Slot depth	C
Width across corners	C
Thread acceptance	C
Tensile strength test	C
Nut proof load test	C

If verifiable in-process inspection is used, inspection sample sizes and reporting shall be in accordance with the applicable ASME, ASTM, or SAE quality system consensus standard.

For nondesignated dimensional characteristics, the provisions of ASME B18.18.1 shall apply. Should a nondesignated dimension be determined to be outside its specified limits, it shall be deemed conforming to this Standard if the user who is the installer accepts the dimension, based upon form, fit, and function considerations.

2 GENERAL DATA

2.1 Heads

2.1.1 Head Height. All dimensions pertaining to head height specified in the dimensional tables shall be measured parallel to the axis of screw and those relating to the top of head shall represent a metal-to-metal measurement. In other words, any truncation of rounded head contours due to the slot or recess shall not be considered part of the head height.

Total or overall head heights shall be measured from the top of the head to the plane of the bearing surface for flat bearing surface type heads, to the plane of the undercut for undercut countersunk heads, and to the junction of the conical bearing surface with the basic screw diameter for countersunk heads.

Head side heights shall be measured from the theoretical intersection of the top surface of head with the head diameter to the plane of the bearing surface for flat bearing surface type heads, to the plane of the undercut for undercut countersunk heads, and to the junction of the conical bearing surface with the basic screw diameter for countersunk heads.

On countersunk heads, the junction of the conical bearing surface with the basic screw diameter may not necessarily be the same as the actual junction of head with shank and the head height delineating the conical bearing surface is a reference dimension.

2.1.2 Bearing Surface. The bearing surface of flat bearing surface type machine screw heads shall be perpendicular to the axis of the screw shanks within 2 deg.

2.1.3 Gaging of Recess. The penetration gaging depth of the recess in recessed head screws shall be the primary inspection criteria. It is measured, parallel to the axis of screw, from the intersection of the maximum diameter of the recess with the head surface to the point at which penetration gage bottoms.

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Recess gaging values are included in the respective dimensional tables, including the reference dimensions of recess diameter, wing width, and total recess depth. The gaging method and specifications for gages are contained in Appendix III.

Recess wobble gages, gaging procedures, and permissible limits are given in Appendix IV.

2.1.4 Slot. The depth of the slot in slotted head screws shall be measured, parallel to the axis of screw, from the top of the head to the intersection of the bottom of the slot with the head surface or bearing surface.

The width of the slot shall be measured perpendicular to the axis of the screw, from the theoretical intersection of the bottom and one side of the slot, to the theoretical intersection of the bottom and the other side of the slot.

Unless specified by the purchaser, the slot width may be slightly tapered from the bottom to the top, or straight, at the option of the manufacturer.

2.1.5 Feature Positional Tolerances. The positional relationship of the heads and driving provisions of screws with respect to the shanks of screws (formerly defined as eccentricity) shall be as follows.

(a) True Position of Head. The axis of the head shall be located at true position relative to the axis of the screw shank within a tolerance zone having a diameter equivalent to 6% of the specified maximum head diameter, or maximum width across flats of hex and hex washer heads, regardless of feature size.

(b) True Position of Recess. The recess in cross recessed head screws shall be located at true position relative to the axis of the screw shank within a tolerance zone having a diameter equivalent to 12% of the basic screw diameter or 0.030 in., whichever is greater, regardless of feature size.

(c) True Position of Slot. The slot in slotted head screws shall be located at true position relative to the axis of the screw shank within a tolerance zone having a diameter equivalent to 12% of the basic screw diameter or 0.020 in., whichever is greater.

2.1.6 Underhead Fillets. Machine screws shall have a definite underhead fillet large enough to ensure that full fastener strength is achieved. The radius of the fillet under countersunk head screws shall be no greater than 40% of the basic screw diameter. The radius of the fillet under truss heads and number 6 sized pan heads shall be no greater than 25% of the basic screw diameter. The radius of the fillet under all other head styles shall be no greater than 15% of the basic screw diameter.

2.2 Length

2.2.1 Measurement. The nominal length of screw L shall be measured, parallel to the axis of screw, from the extreme point to the plane of the bearing surface for screws having perpendicular bearing surface type heads, and to the theoretical intersection of the top surface of head with the head diameter for screws having countersunk type heads. For all oval heads, the overall length L_o shall be measured, parallel to the axis of the screw, from the extreme point to the top of the head, where:

$$L_o = L + C$$

2.2.2 Tolerance on Length. The length tolerance shall apply to L_o for all oval heads and to L for all other head styles. The tolerance on the length of machine screws shall conform to the following for the respective screw types:

Nominal Screw Length	Tolerance on Length for Nominal Screw Size: 0000 Through 00	0 Through 12	1/4 Through 3/4
Up to 1/2 in., incl.	−0.01	−0.02	−0.03
Over 1/2 to 1 in., incl.	−0.02	−0.03	−0.03
Over 1 to 2 in., incl.	...	−0.06	−0.06
Over 2 in.	...	−0.09	−0.09

2.3 Threads

2.3.1 Machine Screws. The threads on machine screws, except for the No. 0000, No. 000, and No. 00 sizes, which are covered in Appendix V, shall be Unified Standard, Class 2A, UNC and UNF series, or UNRC and UNRF series, at option of manufacturer, in accordance with ASME B1.1. For threads with additive finish, the maximum diameters of Class 2A may be exceeded by the amount of the allowance; that is, the Class 2A maximum diameters shall apply to an unplated or uncoated part, or to a part before plating or coating, whereas the basic diameters (Class 3A GO) shall apply to a part after plating or coating. The minimum major diameter of plated or coated screws may approach but shall not be less than the Class 2A minimum limit.

2.3.2 Machine Screw Nuts. Threads shall be Unified Standard, Class 2B, UNC or UNF series for hexagon machine screw nuts, and UNC series for square machine screw nuts, in accordance with ASME B1.1.

2.4 Length of Thread

2.4.1 Machine Screws. Machine screws shall have thread lengths conforming to the following (on screws threaded full length, the distance to first full form thread shall be measured, parallel to the axis of screw, from the bearing surface of the head to the face of a nonchamfered or noncounterbored standard 3A GO thread ring gage assembled by hand as far as the thread will permit).

(a) Sizes No. 5 and Smaller. Screws of nominal lengths equal to three diameters and shorter shall have full form threads extending to within one pitch (thread) of the bearing surface of the head, or closer, if practicable. Nominal lengths greater than three diameters, up to and including 1 1/8 in., shall have full form threads extending to within two pitches (threads) of the bearing surface

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of the head, or closer, if practicable. Screws of longer nominal lengths shall, unless otherwise specified, have a minimum length of full form thread of 1 in.

(b) Sizes No. 6 and Larger. Screws of nominal lengths equal to three diameters and shorter shall have full form threads extending to within one pitch (thread) of the bearing surface of the head, or closer, if practicable. Nominal lengths greater than three diameters, up to and including 2 in., shall have full form threads extending to within two pitches (threads) of the bearing surface of the head, or closer, if practicable. Screws of longer nominal lengths shall, unless otherwise specified, have a minimum length of full form thread of 1.50 in.

2.5 Points

Unless otherwise specified, machine screws shall have plain sheared ends. Where so specified, header points shall be as shown in Table 19. Other points or pointing of longer lengths to header point dimensions may require machining.

2.6 Diameter of Body

2.6.1 Machine Screws. The diameter of body on machine screws having other than trim heads shall not be less than the Class 2A thread minimum pitch diameter nor greater than the basic major diameter of the thread.

2.6.2 Trim Head Machine Screws. The diameter of body on trim head machine screws shall not be less than the Class 2A thread minimum pitch diameter nor greater than the basic major diameter of the thread. Screws not threaded to the head shall have a 0.062 in., minimum length shoulder under the head with diameter limits as specified in the dimensional tables.

2.7 Material

2.7.1 Machine Screws. Unless otherwise specified, machine screws shall be fabricated from carbon steel and shall have a minimum tensile strength of 60,000 psi.

Machine screws, where so specified, may also be made from higher strength steels, corrosion resistant steel, brass, monel, aluminum alloys, or other materials, as agreed upon between the manufacturer and the purchaser.

2.7.2 Machine Screw Nuts. Machine screw nuts are normally supplied in steel, corrosion resistant steel, or brass as specified by the purchaser. Unless otherwise specified, no physical requirements shall apply.

2.8 Finish

Unless otherwise specified, machine screws and machine screw nuts shall be supplied with a natural (as processed) finish, unplated or uncoated.

2.9 Workmanship

Machine screws and machine screw nuts shall not contain an excess of surface imperfections that might affect their serviceability, such as, burrs, seams, laps, loose scale, and other irregularities.

2.10 Designation

2.10.1 Machine Screws

(a) Machine screws shall be designated by the following data preferably in the sequence shown: product name including head type and driving provision and designation of the standard, nominal size (number, fraction, or decimal equivalent); threads per inch; nominal length (fraction or decimal equivalent); header point, if desired, material, protective coating, if required.

EXAMPLES:

(1) Slotted Pan Head Machine Screws, ASME B18.6.3, $\frac{1}{4}$ – 20 × $1\frac{1}{4}$, Carbon Steel, Zinc Plated per ASTM F 1941 Fe/Zn 5C.

(2) Type IA Cross Recessed Fillister Head Machine Screw, ASME B18.6.3, 6 – 32 × $\frac{3}{4}$, Brass per ASTM B 21 UNS C46200.

(3) Hexagon Washer Head Machine Screw, ASME B18.6.3, 0.375 – 16 × 1.50, Header Point, Carbon Steel.

(4) Type II Cross Recessed Flat Countersunk Head Machine Screw, ASME B18.6.3, 0.190 – 24 × 1.50, Carbon Steel, Phosphate/Oil per ASTM F 1137 Grade 0D.

(b) For a recommended part identifying number (PIN) system for machine screws, see ASME B18.24.

2.10.2 Machine Screws Nuts

(a) Machine screws nuts shall be designated by the following data preferably in the sequence shown: product name and designation of the standard, nominal size (number, fraction, or decimal equivalent); threads per inch, material, protective coating, if required.

EXAMPLES:

(1) Hexagon Machine Screw Nut, ASME B18.6.3, 10 – 24, Steel, Zinc Plated per ASTM F 1941 Fe/Zn 5C.

(2) Square Machine Screw Nut, ASME B18.6.3, 0.138 – 32, Brass per ASTM B 21 UNS C46200.

(b) For a recommended part identifying number (PIN) system for machine screw nuts, see ASME B18.24.

3 REFERENCES

Unless otherwise specified, the standards referenced shall be the most recent at the time of order placement.

ASME B1.1, Unified Inch Screw Threads (UN and UNR Thread Form)

ASME B18.12, Glossary of Terms for Mechanical Fasteners

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ASME B18.18.1, Inspection and Quality Assurance for General Purpose Fasteners

ASME B18.18.2, Inspection and Quality Assurance for High-Volume Machine Assembly Fasteners

ASME B18.24, Part Identifying Number (PIN) Code System for B18 Fastener Products

Publisher: The American Society of Mechanical Engineers (ASME International), Three Park Avenue, New York, NY 10016-5990; Order Department: 22 Law Drive, Box 2300, Fairfield, NJ 07007-2300

ASTM B 21, Specification for Naval Brass, Rod, Bar, and Shapes

ASTM F 1137, Specification for Phosphate/Oil and Phosphate/Organic Corrosion Protective Coatings for Fasteners

ASTM F 1941, Specification for Electrodeposited Coatings on Threaded Fasteners [Unified Inch Screw Threads (UN/UNR)]

Publisher: American Society for Testing and Materials (ASTM), 100 Barr Harbor Drive, West Conshohocken, PA 19428

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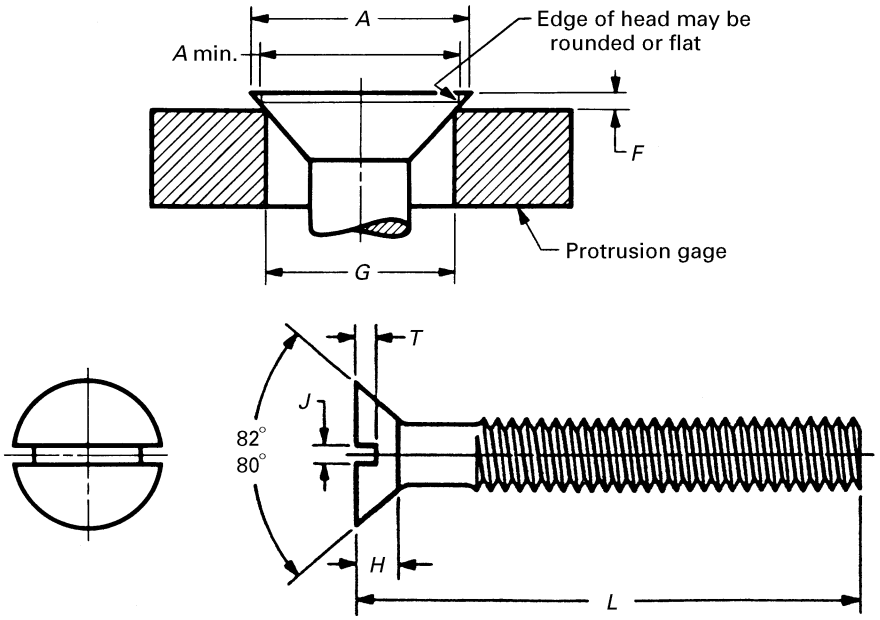


Table 1A Dimensions of Slotted Flat Countersunk Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]		Length, *L* [Note (2)]	Head Diameter, *A*		Head Height, *H*, Ref. [Note (3)]	Slot Width, *J*		Slot Depth, *T*		Protrusion Above Gaging Diameter, *F* [Note (4)]		Gaging Diameter, *G* [Note (4)]
			Max.	Min.		Max.	Min.	Max.	Min.	Max.	Min.	
0000	0.0210	. . .	0.040	0.035	0.011	0.008	0.004	0.007	0.003	[Note (5)]	[Note (5)]	[Note (5)]
000	0.0340	. . .	0.060	0.055	0.016	0.011	0.007	0.009	0.005	[Note (5)]	[Note (5)]	[Note (5)]
00	0.0470	. . .	0.087	0.080	0.028	0.017	0.010	0.014	0.009	[Note (5)]	[Note (5)]	[Note (5)]
0	0.0600	1/8	0.112	0.096	0.035	0.023	0.016	0.015	0.010	0.026	0.016	0.078
1	0.0730	1/8	0.137	0.120	0.043	0.026	0.019	0.019	0.012	0.028	0.016	0.101
2	0.0860	1/8	0.162	0.144	0.051	0.031	0.023	0.023	0.015	0.029	0.017	0.124
3	0.0990	1/8	0.187	0.167	0.059	0.035	0.027	0.027	0.017	0.031	0.018	0.148
4	0.1120	3/16	0.212	0.191	0.067	0.039	0.031	0.030	0.020	0.032	0.019	0.172
5	0.1250	3/16	0.237	0.215	0.075	0.043	0.035	0.034	0.022	0.034	0.020	0.196
6	0.1380	3/16	0.262	0.238	0.083	0.048	0.039	0.038	0.024	0.036	0.021	0.220
8	0.1640	1/4	0.312	0.285	0.100	0.054	0.045	0.045	0.029	0.039	0.023	0.267
10	0.1900	5/16	0.362	0.333	0.116	0.060	0.050	0.053	0.034	0.042	0.025	0.313
12	0.2160	3/8	0.412	0.380	0.132	0.067	0.056	0.060	0.039	0.045	0.027	0.362
1/4	0.2500	7/16	0.477	0.442	0.153	0.075	0.064	0.070	0.046	0.050	0.029	0.424
5/16	0.3125	1/2	0.597	0.556	0.191	0.084	0.072	0.088	0.058	0.057	0.034	0.539
3/8	0.3750	9/16	0.717	0.670	0.230	0.094	0.081	0.106	0.070	0.065	0.039	0.653
7/16	0.4375	5/8	0.760	0.715	0.223	0.094	0.081	0.103	0.066	0.073	0.044	0.690
1/2	0.5000	3/4	0.815	0.765	0.223	0.106	0.091	0.103	0.065	0.081	0.049	0.739
9/16	0.5625	. . .	0.932	0.878	0.260	0.118	0.102	0.120	0.077	0.089	0.053	0.851
5/8	0.6250	. . .	1.050	0.990	0.298	0.133	0.116	0.137	0.088	0.097	0.058	0.962
3/4	0.7500	. . .	1.285	1.215	0.372	0.149	0.131	0.171	0.111	0.112	0.067	1.186

GENERAL NOTE: For additional requirements, refer to para. 2.

NOTES:

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

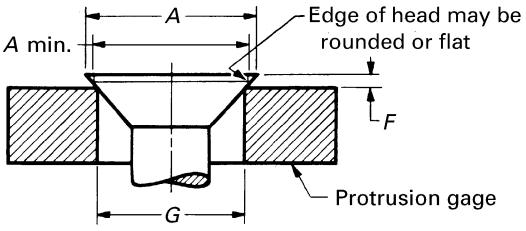
(2) Screws of these lengths and shorter shall have undercut heads as shown in Table 5A.

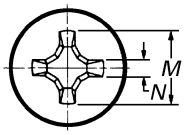
(3) Tabulated values determined from formula for maximum *H* in Appendix A.

(4) No tolerance for gaging diameter is given. If the gaging diameter of the gage used differs from tabulated value, the protrusion will be affected accordingly and the proper protrusion values must be recalculated using the formulas shown in Appendix I.

(5) Not practical to gage.

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This type of recess has a large center opening, wide straight wings, and blunt bottom, with all edges relieved or rounded.

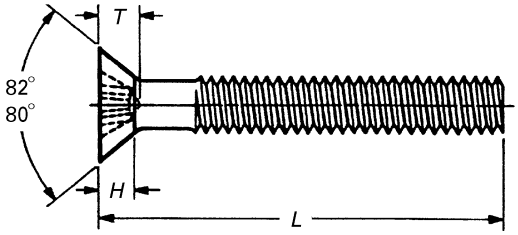


Table 1B Dimensions of Type I Cross Recessed Flat Countersunk Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]		Length, *L* [Note (2)]	Head Diameter, *A*		Head Height, *H*, Ref. [Note (3)]	Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size	Recess Penetration Gaging Depth		Protrusion Above Gaging Diameter, *F* [Note (4)]		Gaging Diameter, *G* [Note (4)]
			Max.	Min.						Max.	Min.	Max.	Min.	
0	0.0600	1/8	0.112	0.096	0.035	0.062	0.035	0.014	0	0.036	0.020	0.026	0.016	0.078
1	0.0730	1/8	0.137	0.120	0.043	0.070	0.043	0.015	0	0.044	0.028	0.028	0.016	0.101
2	0.0860	1/8	0.162	0.144	0.051	0.096	0.055	0.017	1	0.056	0.040	0.029	0.017	0.124
3	0.0990	1/8	0.187	0.167	0.059	0.100	0.060	0.018	1	0.061	0.045	0.031	0.018	0.148
4	0.1120	3/16	0.212	0.191	0.067	0.122	0.081	0.018	1	0.082	0.066	0.032	0.019	0.172
5	0.1250	3/16	0.237	0.215	0.075	0.148	0.074	0.027	2	0.075	0.052	0.034	0.020	0.196
6	0.1380	3/16	0.262	0.238	0.083	0.168	0.094	0.029	2	0.095	0.072	0.036	0.021	0.220
8	0.1640	1/4	0.312	0.285	0.100	0.182	0.110	0.030	2	0.110	0.087	0.039	0.023	0.267
10	0.1900	5/16	0.362	0.333	0.116	0.198	0.124	0.032	2	0.125	0.102	0.042	0.025	0.313
12	0.2160	3/8	0.412	0.380	0.132	0.262	0.144	0.035	3	0.139	0.116	0.045	0.027	0.362
1/4	0.2500	7/16	0.477	0.442	0.153	0.276	0.160	0.036	3	0.154	0.131	0.050	0.029	0.424
5/16	0.3125	1/2	0.597	0.556	0.191	0.358	0.205	0.061	4	0.196	0.174	0.057	0.034	0.539
3/8	0.3750	9/16	0.717	0.670	0.230	0.386	0.234	0.065	4	0.225	0.203	0.065	0.039	0.653
7/16	0.4375	5/8	0.760	0.715	0.223	0.402	0.250	0.068	4	0.241	0.219	0.073	0.044	0.690
1/2	0.5000	3/4	0.815	0.765	0.223	0.418	0.265	0.069	4	0.256	0.234	0.081	0.049	0.739
9/16	0.5625	...	0.932	0.878	0.260	0.443	0.289	0.073	4	0.280	0.258	0.089	0.053	0.851
5/8	0.6250	...	1.050	0.990	0.298	0.565	0.329	0.079	5	0.309	0.283	0.097	0.058	0.962
3/4	0.7500	...	1.285	1.215	0.372	0.628	0.393	0.087	5	0.373	0.347	0.112	0.067	1.186

GENERAL NOTE: For additional requirements, refer to para. 2.

NOTES:

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

(2) Screws of these lengths and shorter shall have undercut heads as shown in Table 5B.

(3) Tabulated values determined from formula for maximum *H* in Appendix A.

(4) No tolerance for gaging diameter is given. If the gaging diameter of the gage used differs from tabulated value, the protrusion will be affected accordingly and the proper protrusion values must be recalculated using the formulas shown in Appendix I.

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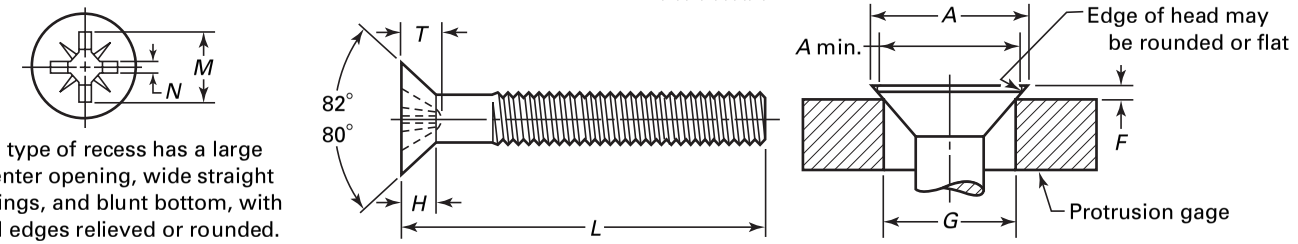


Table 1C Dimensions of Type IA Cross Recessed Flat Countersunk Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]		Length, *L* [Note (2)]	Head Diameter, *A*		Head Height, *H*, Ref. [Note (3)]	Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size	Recess Penetration Gaging Depth		Protrusion Above Gaging Diameter, *F* [Note (4)]		Gaging Diameter, *G* [Note (4)]
			Max.	Min.						Max.	Min.	Max.	Min.	
0	0.0600	1/8	0.112	0.096	0.035	0.062	0.036	0.018	0	0.037	0.021	0.026	0.016	0.078
1	0.0730	1/8	0.137	0.120	0.043	0.070	0.044	0.018	0	0.045	0.029	0.028	0.016	0.101
2	0.0860	1/8	0.162	0.144	0.051	0.096	0.055	0.029	1	0.053	0.037	0.029	0.017	0.124
3	0.0990	1/8	0.187	0.167	0.059	0.100	0.060	0.029	1	0.058	0.042	0.031	0.018	0.148
4	0.1120	3/16	0.212	0.191	0.067	0.122	0.081	0.030	1	0.079	0.063	0.032	0.019	0.172
5	0.1250	3/16	0.237	0.215	0.075	0.148	0.077	0.041	2	0.071	0.053	0.034	0.020	0.196
6	0.1380	3/16	0.262	0.238	0.083	0.168	0.098	0.041	2	0.091	0.073	0.036	0.021	0.220
8	0.1640	1/4	0.312	0.285	0.100	0.182	0.112	0.041	2	0.107	0.089	0.039	0.023	0.267
10	0.1900	5/16	0.362	0.333	0.116	0.198	0.127	0.041	2	0.122	0.104	0.042	0.025	0.313
12	0.2160	3/8	0.412	0.380	0.132	0.262	0.149	0.056	3	0.136	0.118	0.045	0.027	0.362
1/4	0.2500	7/16	0.477	0.442	0.153	0.276	0.164	0.057	3	0.151	0.133	0.050	0.029	0.424
5/16	0.3125	1/2	0.597	0.556	0.191	0.358	0.211	0.086	4	0.193	0.175	0.057	0.034	0.539
3/8	0.3750	9/16	0.717	0.670	0.230	0.386	0.239	0.086	4	0.222	0.204	0.065	0.039	0.653
7/16	0.4375	5/8	0.760	0.715	0.223	0.402	0.256	0.086	4	0.238	0.220	0.073	0.044	0.690
1/2	0.5000	3/4	0.815	0.765	0.223	0.418	0.271	0.086	4	0.253	0.235	0.081	0.049	0.739
9/16	0.5625	. . .	0.932	0.878	0.260	0.440	0.294	0.087	4	0.276	0.258	0.089	0.053	0.851
5/8	0.6250	. . .	1.050	0.990	0.298	0.566	0.334	0.098	5	0.307	0.286	0.097	0.058	0.962
3/4	0.7500	. . .	1.285	1.215	0.372	0.630	0.400	0.099	5	0.372	0.351	0.112	0.067	1.186

GENERAL NOTE: For additional requirements, refer to para. 2.

NOTES:

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

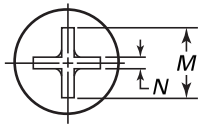
(2) Screws of these lengths and shorter shall have undercut heads as shown in Table 5C.

(3) Tabulated values determined from formula for maximum *H* in Appendix A.

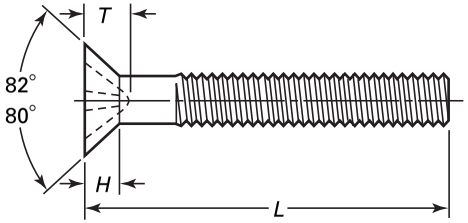
(4) No tolerance for gaging diameter is given. If the gaging diameter of the gage used differs from tabulated value, the protrusion will be affected accordingly and the proper protrusion values must be recalculated using the formulas shown in Appendix I.

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This type of recess consists of two intersecting slots with parallel sides converging to a slightly truncated apex at bottom of recess.



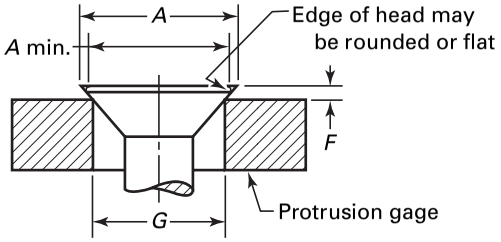


Table 1D Dimensions of Type II Cross Recessed Flat Countersunk Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]		Length, *L* [Note (2)]	Head Diameter, *A*		Head Height, *H*, Ref. [Note (3)]	Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size [Note (4)]	Recess Penetration Gaging Depth		Protrusion Above Gaging Diameter, *F* [Note (5)]		Gaging Diameter, *G* [Note (5)]
			Max.	Min.						Max.	Min.	Max.	Min.	
0	0.0600	1/8	0.112	0.096	0.035	0.078	0.036	0.021	...	[Note (6)]	[Note (6)]	0.026	0.016	0.078
1	0.0730	1/8	0.137	0.120	0.043	0.092	0.048	0.024	...	[Note (6)]	[Note (6)]	0.028	0.016	0.101
2	0.0860	1/8	0.162	0.144	0.051	0.114	0.060	0.027	...	0.040	0.029	0.029	0.017	0.124
3	0.0990	1/8	0.187	0.167	0.059	0.133	0.072	0.030	...	0.053	0.041	0.031	0.018	0.148
4	0.1120	3/16	0.212	0.191	0.067	0.151	0.082	0.032	...	0.064	0.052	0.032	0.019	0.172
5	0.1250	3/16	0.237	0.215	0.075	0.169	0.094	0.035	...	0.077	0.064	0.034	0.020	0.196
6	0.1380	3/16	0.262	0.238	0.083	0.188	0.106	0.038	...	0.089	0.075	0.036	0.021	0.220
8	0.1640	1/4	0.312	0.285	0.100	0.224	0.124	0.043	...	0.113	0.099	0.039	0.023	0.267
10	0.1900	5/16	0.362	0.333	0.116	0.260	0.148	0.048	...	0.137	0.122	0.042	0.025	0.313
12	0.2160	3/8	0.412	0.380	0.132	0.297	0.172	0.054	...	0.162	0.145	0.045	0.027	0.362
1/4	0.2500	7/16	0.477	0.442	0.153	0.344	0.195	0.061	...	0.193	0.176	0.050	0.029	0.424
5/16	0.3125	1/2	0.597	0.556	0.191	0.432	0.252	0.074	...	0.251	0.232	0.057	0.034	0.539
3/8	0.3750	9/16	0.717	0.670	0.230	0.509	0.302	0.086	...	0.303	0.281	0.065	0.039	0.653
7/16	0.4375	5/8	0.760	0.715	0.223	0.554	0.332	0.092	...	0.332	0.310	0.073	0.044	0.690
1/2	0.5000	3/4	0.815	0.765	0.223	0.593	0.358	0.098	...	0.359	0.335	0.081	0.049	0.739
9/16	0.5625	...	0.932	0.878	0.260	0.640	0.387	0.104	...	0.389	0.364	0.089	0.053	0.851
5/8	0.6250	...	1.050	0.990	0.298	0.640	0.387	0.104	...	0.389	0.364	0.097	0.058	0.962
3/4	0.7500	...	1.285	1.215	0.372	0.640	0.387	0.104	...	0.389	0.364	0.112	0.067	1.186

GENERAL NOTE: For additional requirements, refer to para. 2.

NOTES:

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

(2) Screws of these lengths and shorter shall have undercut heads as shown in Table 5D.

(3) Tabulated values determined from formula for maximum *H* in Appendix A.

(4) Point same on all drivers.

(5) No tolerance for gaging diameter is given. If the gaging diameter of the gage used differs from tabulated value, the protrusion will be affected accordingly and the proper protrusion values must be recalculated using the formulas shown in Appendix I.

(6) Not practical to gage.

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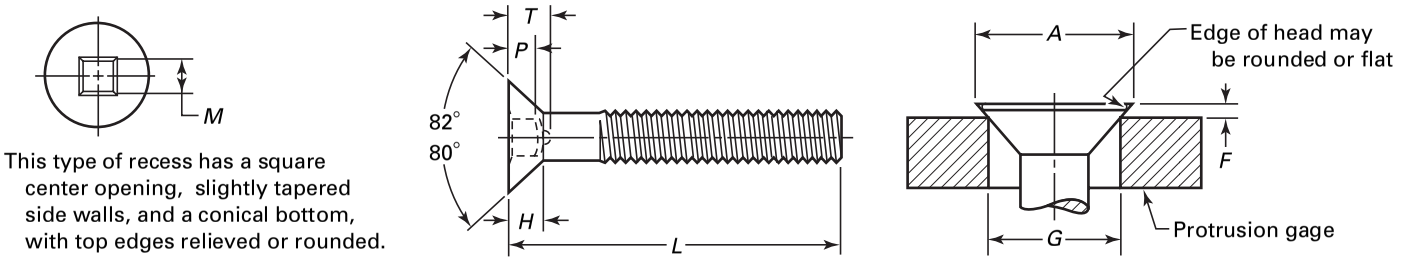


Table 1E Dimensions of Type III Square Recessed Flat Countersunk Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]	Length, *L* [Note (2)]	Head Diameter, *A*		Head Height, *H*, Ref. [Note (3)]	Recess Across Flats, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Size [Note (4)]	Recess Penetration Gaging Depth, *P* [Note (5)]		Protrusion Above Gaging Diameter, *F*		Gaging Diameter, *G* [Note (6)]
		Max.	Min.					Max.	Min.	Max.	Min.	
2 0.0860	1/8	0.162	0.144	0.051	0.050	0.057	00	0.033	0.028	0.029	0.017	0.124
3 0.0990	1/8	0.187	0.167	0.059	0.070	0.066	0	0.038	0.028	0.031	0.018	0.148
4 0.1120	3/16	0.212	0.191	0.067	0.070	0.066	0	0.038	0.028	0.032	0.019	0.172
5 0.1250	3/16	0.237	0.215	0.075	0.091	0.096	1S	0.055	0.040	0.034	0.020	0.196
6 0.1380	3/16	0.262	0.238	0.083	0.091	0.096	1S	0.055	0.040	0.036	0.021	0.220
8 0.1640	1/4	0.312	0.285	0.100	0.112	0.115	2S	0.063	0.048	0.039	0.023	0.267
10 0.1900	5/16	0.362	0.333	0.116	0.112	0.127	2R	0.075	0.060	0.042	0.025	0.313
12 0.2160	3/8	0.412	0.380	0.132	0.133	0.158	3R	0.095	0.080	0.045	0.027	0.362
1/4 0.2500	7/16	0.477	0.442	0.153	0.133	0.158	3R	0.095	0.080	0.050	0.029	0.424
5/16 0.3125	1/2	0.597	0.556	0.191	0.191	0.194	4R	0.100	0.085	0.057	0.034	0.539
3/8 0.3750	9/16	0.717	0.670	0.230	0.191	0.194	4R	0.100	0.085	0.065	0.039	0.653

GENERAL NOTE: For additional requirements, refer to para. 2.

NOTES:

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

(2) Screws of these lengths and shorter shall have undercut heads as shown in Table 5E.

(3) Tabulated values determined from formula for maximum *H* in Appendix A.

(4) "R" in the recess size tabulation means regular depth recess, and the "S" means short depth recess.

(5) Square recesses incorporate a slight taper on the sides of the recess. This taper can result in loss of penetration gaging depth on finished fasteners due to the build up of plating in the recesses. The recess penetration dimensions specified here are for finished (plated) product. Manufacturers should be advised that they should not use all this tolerance in the heading process, or an out of tolerance condition could exist after plating.

(6) No tolerance for gaging diameter is given. If the gaging diameter of the gage used differs from tabulated value, the protrusion will be affected accordingly and the proper protrusion values must be recalculated using the formulas shown in Appendix I.

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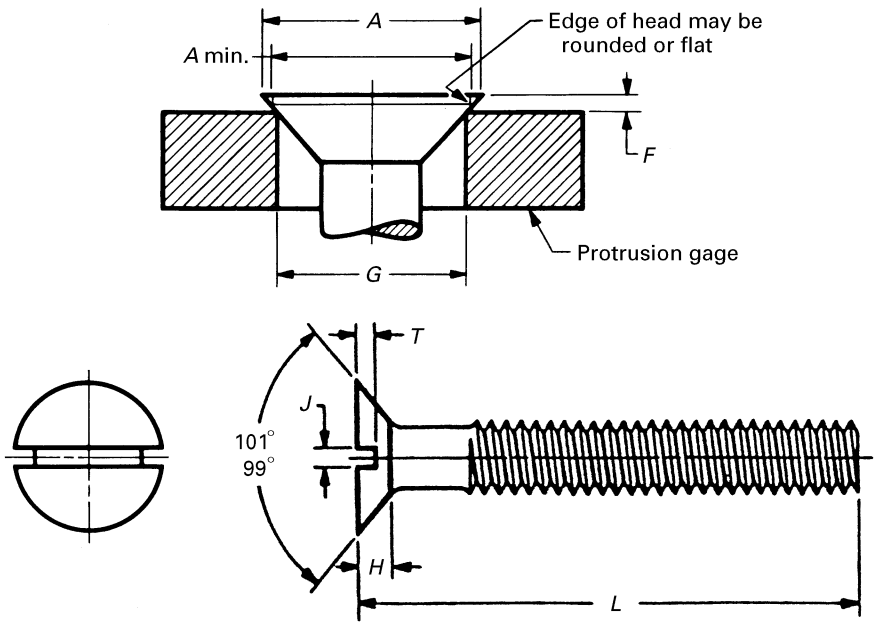


Table 2A Dimensions of Slotted 100 deg Flat Countersunk Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]		Head Diameter, *A*		Head Height, *H*, Ref. [Note (2)]	Slot Width, *J*		Slot Depth, *T*		Protrusion Above Gaging Diameter, *F* [Note (3)]		Gaging Diameter, *G* [Note (3)]
		Max.	Min.		Max.	Min.	Max.	Min.	Max.	Min.	
0000	0.0210	0.040	0.035	0.009	0.008	0.005	0.008	0.004	[Note (4)]	[Note (4)]	[Note (4)]
000	0.0340	0.060	0.055	0.014	0.012	0.008	0.011	0.007	[Note (4)]	[Note (4)]	[Note (4)]
00	0.0470	0.087	0.080	0.020	0.017	0.010	0.013	0.008	[Note (4)]	[Note (4)]	[Note (4)]
0	0.0600	0.112	0.095	0.026	0.023	0.016	0.013	0.008	0.020	0.012	0.074
1	0.0730	0.137	0.118	0.031	0.026	0.019	0.016	0.010	0.021	0.013	0.098
2	0.0860	0.162	0.142	0.037	0.031	0.023	0.019	0.012	0.022	0.014	0.121
3	0.0990	0.187	0.165	0.043	0.035	0.027	0.022	0.014	0.024	0.015	0.144
4	0.1120	0.212	0.188	0.049	0.039	0.031	0.024	0.017	0.025	0.016	0.167
6	0.1380	0.262	0.235	0.060	0.048	0.039	0.030	0.022	0.028	0.017	0.214
8	0.1640	0.312	0.282	0.072	0.054	0.045	0.036	0.027	0.031	0.019	0.261
10	0.1900	0.362	0.329	0.083	0.060	0.050	0.042	0.031	0.034	0.021	0.307
1/4	0.2500	0.477	0.437	0.110	0.075	0.064	0.055	0.042	0.040	0.025	0.415
5/16	0.3125	0.597	0.550	0.138	0.084	0.072	0.069	0.053	0.047	0.030	0.526
3/8	0.3750	0.717	0.662	0.165	0.094	0.081	0.083	0.065	0.053	0.034	0.638

GENERAL NOTE: For additional requirements, refer to para. 2.

NOTES:

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

(2) Tabulated values determined from formula for maximum *H* in Appendix A.

(3) No tolerance for gaging diameter is given. If the gaging diameter of the gage used differs from tabulated value, the protrusion will be affected accordingly and the proper protrusion values must be recalculated using the formulas shown in Appendix I.

(4) Not practical to gage.

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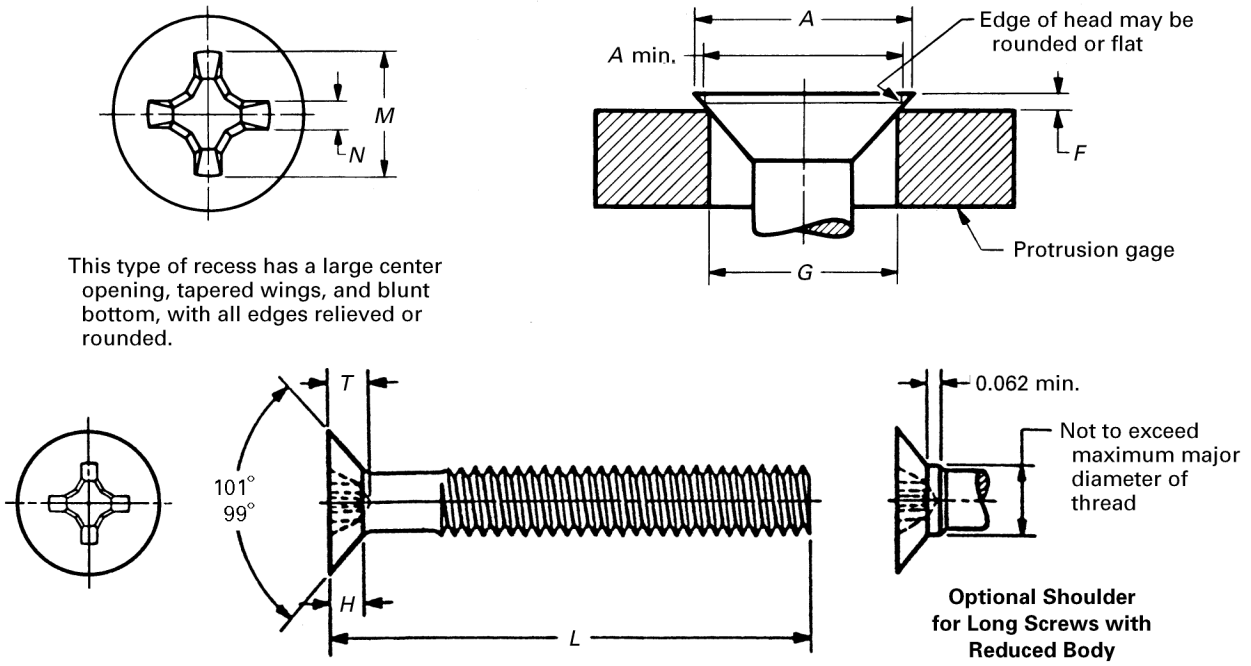


Table 2B Dimensions of Type I Cross Recessed 100 deg Flat Countersunk Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]	Head Diameter, *A*		Head Height, *H*, Ref. [Note (2)]	Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size	Recess Penetration Gaging Depth		Protrusion Above Gaging Diameter, *F* [Note (3)]		Gaging Diameter, *G* [Note (3)]
	Max.	Min.						Max.	Min.	Max.	Min.	
0 0.0600	0.112	0.095	0.026	0.054	0.027	0.013	0	0.028	0.012	0.020	0.012	0.074
1 0.0730	0.137	0.118	0.031	0.062	0.035	0.014	0	0.036	0.020	0.021	0.013	0.098
2 0.0860	0.162	0.142	0.037	0.088	0.048	0.012	1	0.049	0.033	0.022	0.014	0.121
3 0.0990	0.187	0.165	0.043	0.096	0.055	0.014	1	0.056	0.040	0.024	0.015	0.144
4 0.1120	0.212	0.188	0.049	0.110	0.070	0.018	1	0.071	0.055	0.025	0.016	0.167
6 0.1380	0.262	0.235	0.060	0.148	0.074	0.027	2	0.075	0.052	0.028	0.017	0.214
8 0.1640	0.312	0.282	0.072	0.162	0.090	0.028	2	0.090	0.067	0.031	0.019	0.261
10 0.1900	0.362	0.329	0.083	0.178	0.104	0.030	2	0.105	0.082	0.034	0.021	0.307
1/4 0.2500	0.477	0.437	0.110	0.240	0.124	0.033	3	0.118	0.095	0.040	0.025	0.415
5/16 0.3125	0.597	0.550	0.138	0.310	0.157	0.053	4	0.148	0.126	0.047	0.030	0.526
3/8 0.3750	0.717	0.662	0.165	0.336	0.182	0.056	4	0.173	0.151	0.053	0.034	0.638

GENERAL NOTE: For additional requirements, refer to para. 2.

NOTES:

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

(2) Tabulated values determined from formula for maximum *H* in Appendix A.

(3) No tolerance for gaging diameter is given. If the gaging diameter of the gage used differs from tabulated value, the protrusion will be affected accordingly and the proper protrusion values must be recalculated using the formulas shown in Appendix I.

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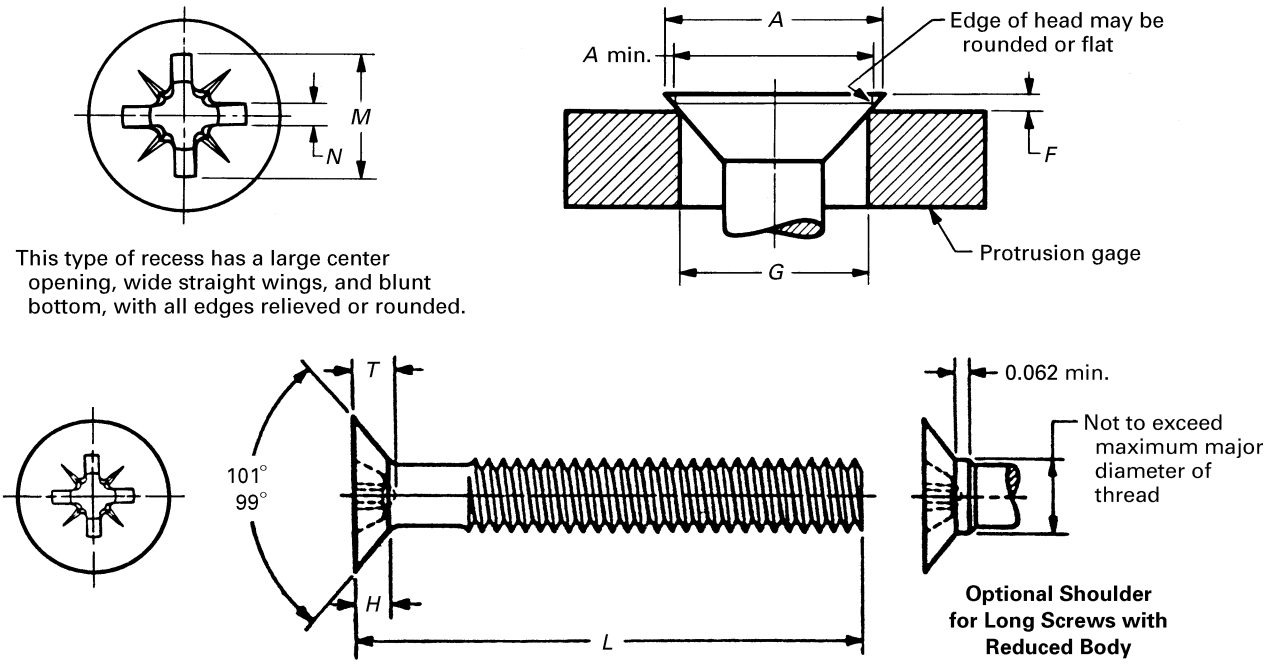


Table 2C Dimensions of Type IA Cross Recessed 100 deg Flat Countersunk Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]		Head Diameter, *A*		Head Height, *H*, Ref. [Note (2)]	Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size	Recess Penetration Gaging Depth		Protrusion Above Gaging Diameter, *F* [Note (3)]		Gaging Diameter, *G* [Note (3)]
		Max.	Min.						Max.	Min.	Max.	Min.	
0	0.0600	0.112	0.095	0.026	0.054	0.028	0.018	0	0.029	0.013	0.020	0.012	0.074
1	0.0730	0.137	0.118	0.031	0.062	0.036	0.018	0	0.037	0.021	0.021	0.013	0.098
2	0.0860	0.162	0.142	0.037	0.088	0.048	0.028	1	0.046	0.030	0.022	0.014	0.121
3	0.0990	0.187	0.165	0.043	0.096	0.055	0.029	1	0.053	0.037	0.024	0.015	0.144
4	0.1120	0.212	0.188	0.049	0.110	0.070	0.029	1	0.068	0.052	0.025	0.016	0.167
6	0.1380	0.262	0.235	0.060	0.148	0.077	0.041	2	0.071	0.053	0.028	0.017	0.214
8	0.1640	0.312	0.282	0.072	0.162	0.092	0.041	2	0.086	0.068	0.031	0.019	0.261
10	0.1900	0.362	0.329	0.083	0.178	0.107	0.041	2	0.101	0.083	0.034	0.021	0.307
1/4	0.2500	0.477	0.437	0.110	0.240	0.126	0.056	3	0.114	0.096	0.040	0.025	0.415
5/16	0.3125	0.597	0.550	0.138	0.310	0.163	0.085	4	0.145	0.127	0.047	0.030	0.526
3/8	0.3750	0.717	0.662	0.165	0.336	0.187	0.085	4	0.170	0.152	0.053	0.034	0.638

GENERAL NOTE: For additional requirements, refer to para. 2.

NOTES:

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

(2) Tabulated values determined from formula for maximum *H* in Appendix A.

(3) No tolerance for gaging diameter is given. If the gaging diameter of the gage used differs from tabulated value, the protrusion will be affected accordingly and the proper protrusion values must be recalculated using the formulas shown in Appendix I.

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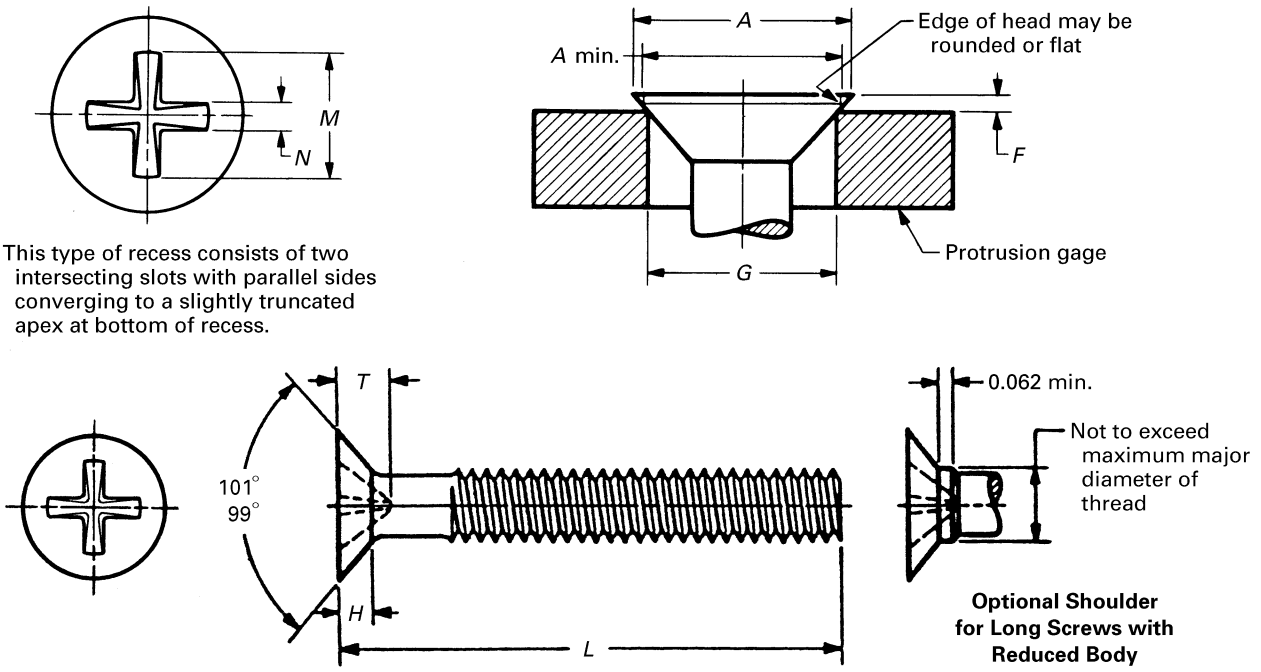


Table 2D Dimensions of Type II Cross Recessed 100 deg Flat Countersunk Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]		Head Diameter, *A*		Head Height, *H*, Ref. [Note (2)]	Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size [Note (3)]	Recess Penetration Gaging Depth		Protrusion Above Gaging Diameter, *F*, [Note (4)]		Gaging Diameter, *G* [Note (4)]
		Max.	Min.						Max.	Min.	Max.	Min.	
0	0.0600	0.112	0.095	0.026	0.057	0.026	0.020	. . .	[Note (5)]	[Note (5)]	0.020	0.012	0.074
1	0.0730	0.137	0.118	0.031	0.078	0.040	0.023	. . .	[Note (5)]	[Note (5)]	0.021	0.013	0.098
2	0.0860	0.162	0.142	0.037	0.092	0.048	0.025	. . .	0.025	0.015	0.022	0.014	0.121
3	0.0990	0.187	0.165	0.043	0.113	0.061	0.027	. . .	0.039	0.028	0.024	0.015	0.144
4	0.1120	0.212	0.188	0.049	0.131	0.070	0.029	. . .	0.051	0.036	0.025	0.016	0.167
6	0.1380	0.262	0.235	0.060	0.157	0.086	0.033	. . .	0.068	0.051	0.028	0.017	0.214
8	0.1640	0.312	0.282	0.072	0.185	0.102	0.037	. . .	0.086	0.067	0.031	0.019	0.261
10	0.1900	0.362	0.329	0.083	0.219	0.122	0.042	. . .	0.109	0.087	0.034	0.021	0.307
1/4	0.2500	0.477	0.437	0.110	0.288	0.164	0.053	. . .	0.154	0.132	0.040	0.025	0.415
5/16	0.3125	0.597	0.550	0.138	0.355	0.207	0.063	. . .	0.197	0.175	0.047	0.030	0.526
3/8	0.3750	0.717	0.662	0.165	0.433	0.258	0.075	. . .	0.249	0.226	0.053	0.034	0.638

GENERAL NOTE: For additional requirements, refer to para. 2.

NOTES:

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

(2) Tabulated values determined from formula for maximum *H* in Appendix A.

(3) Point same on all drivers.

(4) No tolerance for gaging diameter is given. If the gaging diameter of the gage used differs from tabulated value, the protrusion will be affected accordingly and the proper protrusion values must be recalculated using the formulas shown in Appendix I.

(5) Not practical to gage.

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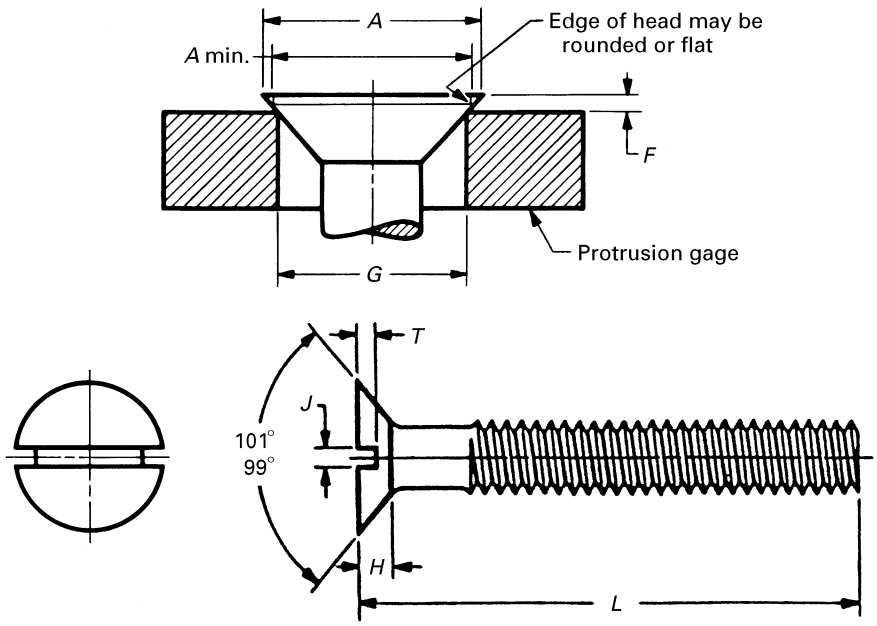


Table 3A Dimensions of Slotted Close Tolerance 100 deg Flat Countersunk Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]		Head Diameter, *A*		Head Height, *H*, Ref. [Note (2)]	Slot Width, *J*		Slot Depth, *T*		Protrusion Above Gaging Diameter, *F* [Note (3)]		Gaging Diameter, *G* [Note (3)]
		Max.	Min.		Max.	Min.	Max.	Min.	Max.	Min.	
4	0.1120	0.212	0.188	0.049	0.039	0.031	0.024	0.017	0.025	0.019	0.167
6	0.1380	0.262	0.235	0.060	0.048	0.039	0.030	0.022	0.028	0.021	0.214
8	0.1640	0.312	0.282	0.072	0.054	0.045	0.036	0.027	0.031	0.023	0.261
10	0.1900	0.362	0.329	0.083	0.060	0.050	0.042	0.031	0.034	0.026	0.307
1/4	0.2500	0.477	0.437	0.110	0.075	0.064	0.055	0.042	0.040	0.031	0.415
5/16	0.3125	0.597	0.550	0.138	0.084	0.072	0.069	0.053	0.047	0.037	0.526
3/8	0.3750	0.717	0.662	0.165	0.094	0.081	0.083	0.065	0.053	0.042	0.638
7/16	0.4375	0.837	0.774	0.193	0.094	0.081	0.097	0.076	0.060	0.047	0.750
1/2	0.5000	0.957	0.887	0.221	0.106	0.091	0.111	0.088	0.066	0.053	0.862
9/16	0.5625	1.077	1.000	0.249	0.118	0.102	0.125	0.099	0.073	0.058	0.974
5/8	0.6250	1.197	1.112	0.276	0.133	0.116	0.139	0.111	0.080	0.063	1.086

GENERAL NOTE: For additional requirements, refer to para. 2.

NOTES:

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

(2) Tabulated values determined from formula for maximum *H* in Appendix A.

(3) No tolerance for gaging diameter is given. If the gaging diameter of the gage used differs from tabulated value, the protrusion will be affected accordingly and the proper protrusion values must be recalculated using the formulas shown in Appendix I.

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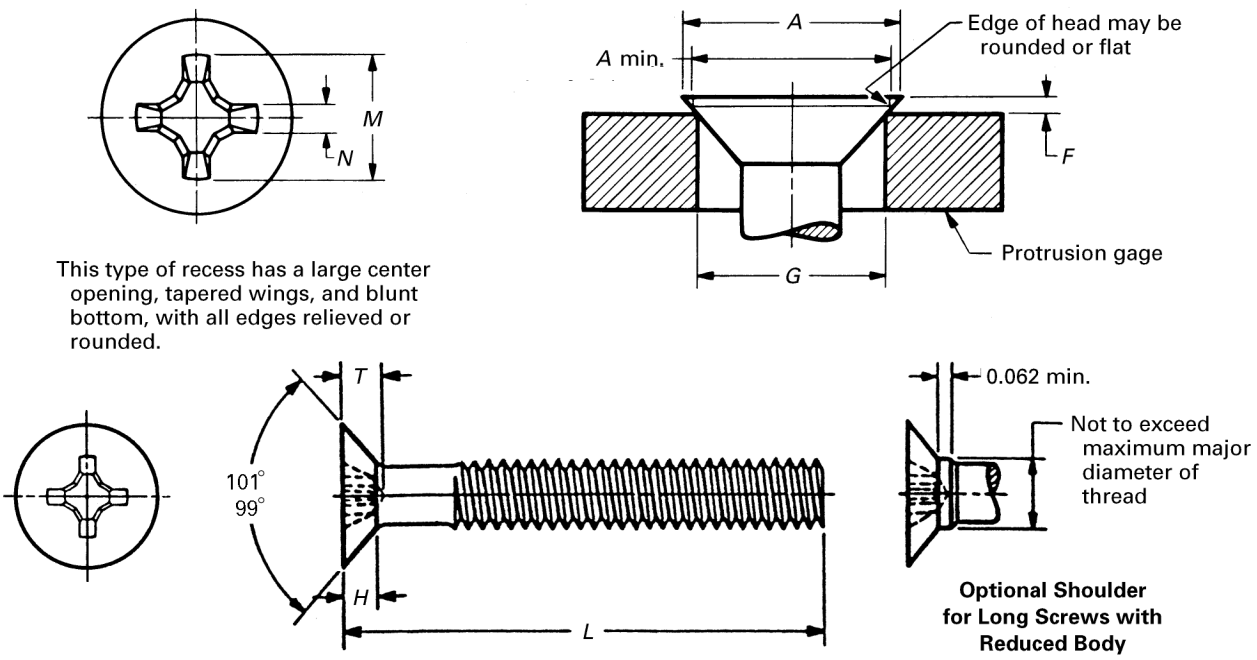


Table 3B Dimensions of Type I Cross Recessed Close Tolerance 100 deg Flat Countersunk Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]		Head Diameter, *A*		Head Height, *H*, Ref. [Note (2)]	Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size	Recess Penetration Gaging Depth		Protrusion Above Gaging Diameter, *F* [Note (3)]		Gaging Diameter, *G* [Note (3)]
		Max.	Min.						Max.	Min.	Max.	Min.	
4	0.1120	0.212	0.188	0.049	0.110	0.070	0.018	1	0.071	0.055	0.025	0.019	0.167
6	0.1380	0.262	0.235	0.060	0.148	0.074	0.027	2	0.075	0.052	0.028	0.021	0.214
8	0.1640	0.312	0.282	0.072	0.162	0.090	0.028	2	0.090	0.067	0.031	0.023	0.261
10	0.1900	0.362	0.329	0.083	0.178	0.104	0.030	2	0.105	0.082	0.034	0.026	0.307
1/4	0.2500	0.477	0.437	0.110	0.240	0.124	0.033	3	0.118	0.095	0.040	0.031	0.415
5/16	0.3125	0.597	0.550	0.138	0.310	0.157	0.053	4	0.148	0.126	0.047	0.037	0.526
3/8	0.3750	0.717	0.662	0.165	0.336	0.182	0.056	4	0.173	0.151	0.053	0.042	0.638
7/16	0.4375	0.837	0.774	0.193	0.360	0.207	0.060	4	0.198	0.176	0.060	0.047	0.750
1/2	0.5000	0.957	0.887	0.221	0.386	0.234	0.063	4	0.226	0.204	0.066	0.053	0.862
9/16	0.5625	1.077	1.000	0.249	0.418	0.265	0.069	4	0.256	0.234	0.073	0.058	0.974
5/8	0.6250	1.197	1.112	0.276	0.504	0.265	0.073	5	0.248	0.222	0.080	0.063	1.086

GENERAL NOTE: For additional requirements, refer to para. 2.

NOTES:

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

(2) Tabulated values determined from formula for maximum *H* in Appendix A.

(3) No tolerance for gaging diameter is given. If the gaging diameter of the gage used differs from tabulated value, the protrusion will be affected accordingly and the proper protrusion values must be recalculated using the formulas shown in Appendix I.

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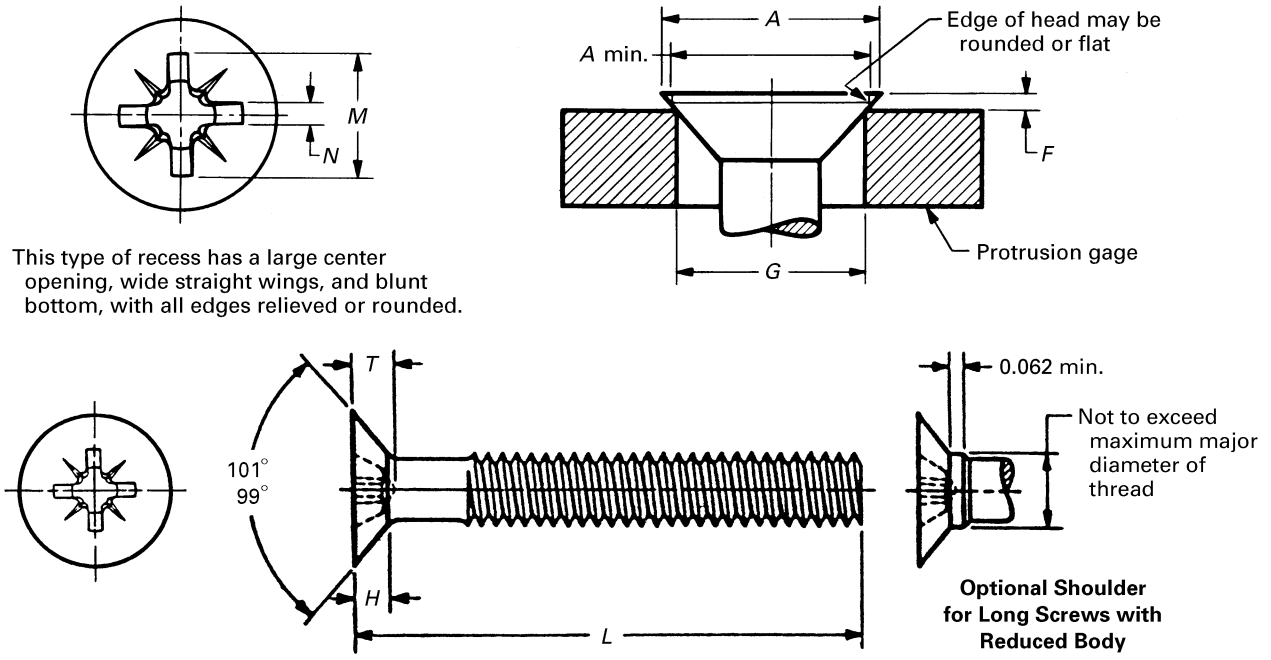


Table 3C Dimensions of Type IA Cross Recessed Close Tolerance 100 deg Flat Countersunk Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]		Head Diameter, *A*		Head Height, *H*, Ref. [Note (2)]	Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size	Recess Penetration Gaging Depth		Protrusion Above Gaging Diameter, *F* [Note (3)]		Gaging Diameter, *G* [Note (3)]
		Max.	Min.						Max.	Min.	Max.	Min.	
4	0.1120	0.212	0.188	0.049	0.110	0.070	0.029	1	0.068	0.052	0.025	0.019	0.167
6	0.1380	0.262	0.235	0.060	0.148	0.077	0.041	2	0.071	0.053	0.028	0.021	0.214
8	0.1640	0.312	0.282	0.072	0.162	0.092	0.041	2	0.086	0.068	0.031	0.023	0.261
10	0.1900	0.362	0.329	0.083	0.178	0.107	0.041	2	0.101	0.083	0.034	0.026	0.307
1/4	0.2500	0.477	0.437	0.110	0.240	0.126	0.056	3	0.114	0.096	0.040	0.031	0.415
5/16	0.3125	0.597	0.550	0.138	0.310	0.163	0.085	4	0.145	0.127	0.047	0.037	0.526
3/8	0.3750	0.717	0.662	0.165	0.336	0.187	0.085	4	0.170	0.152	0.053	0.042	0.638
7/16	0.4375	0.837	0.774	0.193	0.360	0.208	0.086	4	0.194	0.176	0.060	0.047	0.750
1/2	0.5000	0.957	0.887	0.221	0.386	0.239	0.086	4	0.222	0.204	0.066	0.053	0.862
9/16	0.5625	1.077	1.000	0.249	0.418	0.271	0.086	4	0.253	0.235	0.073	0.058	0.974
5/8	0.6250	1.197	1.112	0.276	0.488	0.256	0.097	5	0.228	0.207	0.080	0.063	1.086

GENERAL NOTE: For additional requirements, refer to para. 2.

NOTES:

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

(2) Tabulated values determined from formula for maximum *H* in Appendix A.

(3) No tolerance for gaging diameter is given. If the gaging diameter of the gage used differs from tabulated value, the protrusion will be affected accordingly and the proper protrusion values must be recalculated using the formulas shown in Appendix I.

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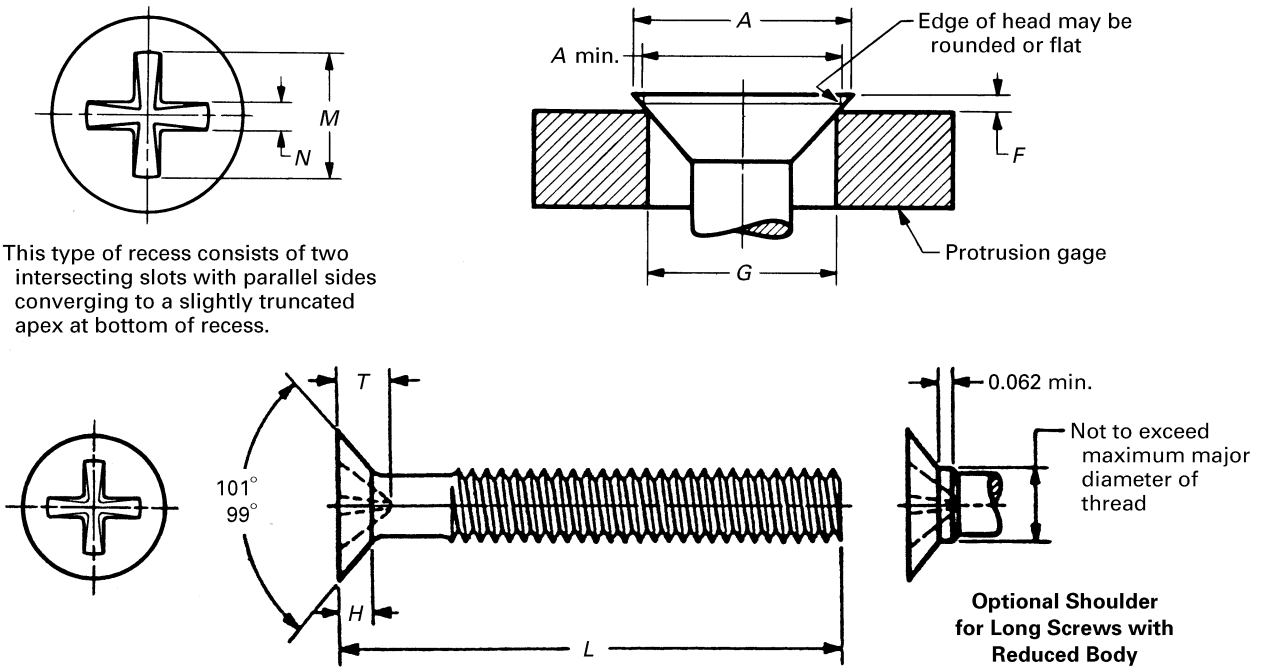


Table 3D Dimensions of Type II Cross Recessed Close Tolerance 100 deg Flat Countersunk Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]		Head Diameter, *A*		Head Height, *H*, Ref. [Note (2)]	Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size [Note (3)]	Recess Penetration Gaging Depth		Protrusion Above Gaging Diameter, *F* [Note (4)]		Gaging Diameter, *G* [Note (4)]
		Max.	Min.						Max.	Min.	Max.	Min.	
4	0.1120	0.212	0.188	0.049	0.131	0.070	0.029	. . .	0.051	0.036	0.025	0.019	0.167
6	0.1380	0.262	0.235	0.060	0.157	0.086	0.033	. . .	0.068	0.051	0.028	0.021	0.214
8	0.1640	0.312	0.282	0.072	0.185	0.102	0.037	. . .	0.086	0.067	0.031	0.023	0.261
10	0.1900	0.362	0.329	0.083	0.219	0.122	0.042	. . .	0.109	0.087	0.034	0.026	0.307
1/4	0.2500	0.477	0.437	0.110	0.288	0.164	0.053	. . .	0.154	0.132	0.040	0.031	0.415
5/16	0.3125	0.597	0.550	0.138	0.355	0.207	0.063	. . .	0.197	0.175	0.047	0.037	0.526
3/8	0.3750	0.717	0.662	0.165	0.433	0.258	0.075	. . .	0.249	0.226	0.053	0.042	0.638
7/16	0.4375	0.837	0.774	0.193	0.496	0.302	0.085	. . .	0.292	0.269	0.060	0.047	0.750
1/2	0.5000	0.957	0.887	0.221	0.555	0.338	0.093	. . .	0.328	0.304	0.066	0.053	0.862
9/16	0.5625	1.077	1.000	0.249	0.628	0.385	0.104	. . .	0.376	0.352	0.073	0.058	0.974
5/8	0.6250	1.197	1.112	0.276	0.687	0.424	0.113	. . .	0.415	0.390	0.080	0.063	1.086

GENERAL NOTE: For additional requirements, refer to para. 2.

NOTES:

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

(2) Tabulated values determined from formula for maximum *H* in Appendix A.

(3) Point same on all drivers.

(4) No tolerance for gaging diameter is given. If the gaging diameter of the gage used differs from tabulated value, the protrusion will be affected accordingly and the proper protrusion values must be recalculated using the formulas shown in Appendix I.

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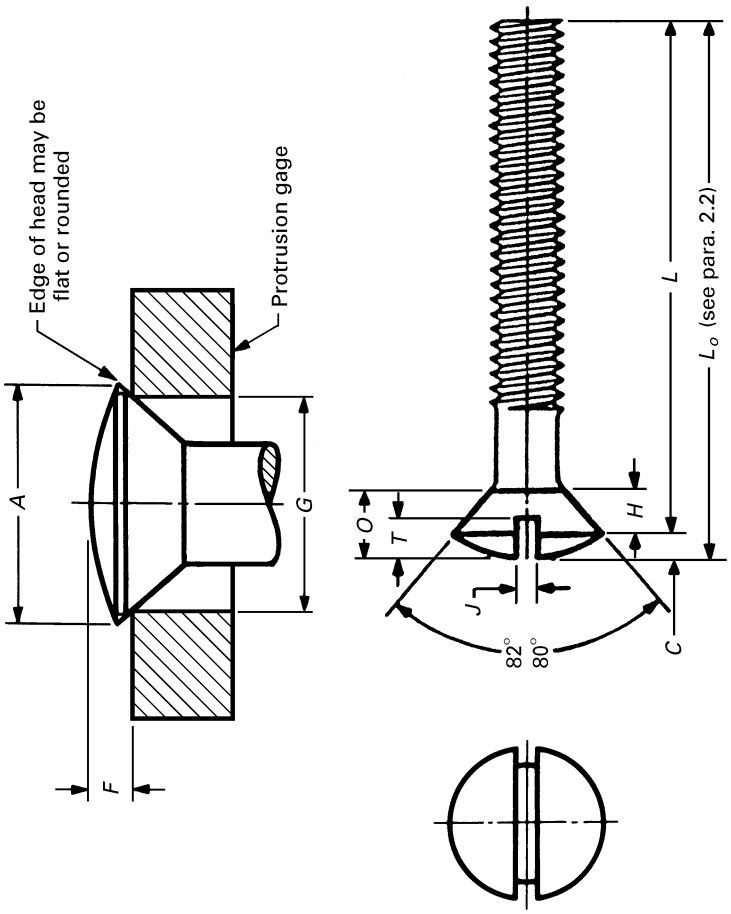


Table 4A Illustration

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Table 4A Dimensions of Slotted Oval Countersunk Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]		Length, *L* [Note (2)]	Head Diameter, *A*		Head Side Height, *H*, Ref. [Note (3)]	Head Crown Height, *C*, Ref.	Total Head Height, *O*, Ref. [Note (4)]	Slot Width, *J*		Slot Depth, *T*		Protrusion Above Gaging Diameter, *F* [Note (5)]		Gaging Diameter, *G* [Note (5)]
			Max.	Min.				Max.	Min.	Max.	Min.	Max.	Min.	
00	0.0470	...	0.087	0.080	0.028	0.014	0.042	0.017	0.010	0.023	0.016	[Note (6)]	[Note (6)]	[Note (6)]
0	0.0600	1/8	0.112	0.096	0.035	0.021	0.056	0.023	0.016	0.030	0.025	0.047	0.031	0.078
1	0.0730	1/8	0.137	0.120	0.043	0.025	0.068	0.026	0.019	0.038	0.031	0.053	0.035	0.101
2	0.0860	1/8	0.162	0.144	0.051	0.029	0.080	0.031	0.023	0.045	0.037	0.058	0.039	0.124
3	0.0990	1/8	0.187	0.167	0.059	0.033	0.092	0.035	0.027	0.052	0.043	0.064	0.044	0.148
4	0.1120	3/16	0.212	0.191	0.067	0.037	0.104	0.039	0.031	0.059	0.049	0.069	0.048	0.172
5	0.1250	3/16	0.237	0.215	0.075	0.041	0.116	0.043	0.035	0.067	0.055	0.075	0.053	0.196
6	0.1380	3/16	0.262	0.238	0.083	0.045	0.128	0.048	0.039	0.074	0.060	0.080	0.057	0.220
8	0.1640	1/4	0.312	0.285	0.100	0.052	0.152	0.054	0.045	0.088	0.072	0.091	0.066	0.267
10	0.1900	5/16	0.362	0.333	0.116	0.060	0.176	0.060	0.050	0.103	0.084	0.102	0.075	0.313
12	0.2160	3/8	0.412	0.380	0.132	0.068	0.200	0.067	0.056	0.117	0.096	0.113	0.084	0.362
1/4	0.2500	7/16	0.477	0.442	0.153	0.079	0.232	0.075	0.064	0.136	0.112	0.129	0.095	0.424
5/16	0.3125	1/2	0.597	0.556	0.191	0.099	0.290	0.084	0.072	0.171	0.141	0.155	0.117	0.539
3/8	0.3750	9/16	0.717	0.670	0.230	0.117	0.347	0.094	0.081	0.206	0.170	0.182	0.139	0.653
7/16	0.4375	5/8	0.760	0.715	0.223	0.122	0.345	0.094	0.081	0.210	0.174	0.195	0.150	0.690
1/2	0.5000	3/4	0.815	0.765	0.223	0.131	0.354	0.106	0.091	0.216	0.176	0.212	0.163	0.739
9/16	0.5625	...	0.932	0.878	0.260	0.150	0.410	0.118	0.102	0.250	0.207	0.239	0.184	0.851
5/8	0.6250	...	1.050	0.990	0.298	0.169	0.467	0.133	0.116	0.285	0.235	0.266	0.206	0.962
3/4	0.7500	...	1.285	1.215	0.372	0.206	0.578	0.149	0.131	0.353	0.293	0.318	0.240	1.186

GENERAL NOTES:

(a) For additional requirements, refer to para. 2.

(b) For reference, see Table 4A Illustration on previous page.

NOTES:

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

(2) Screws of these lengths and shorter shall have undercut heads as shown in Table 6A.

(3) Tabulated values determined from formula for maximum *H* in Appendix A.

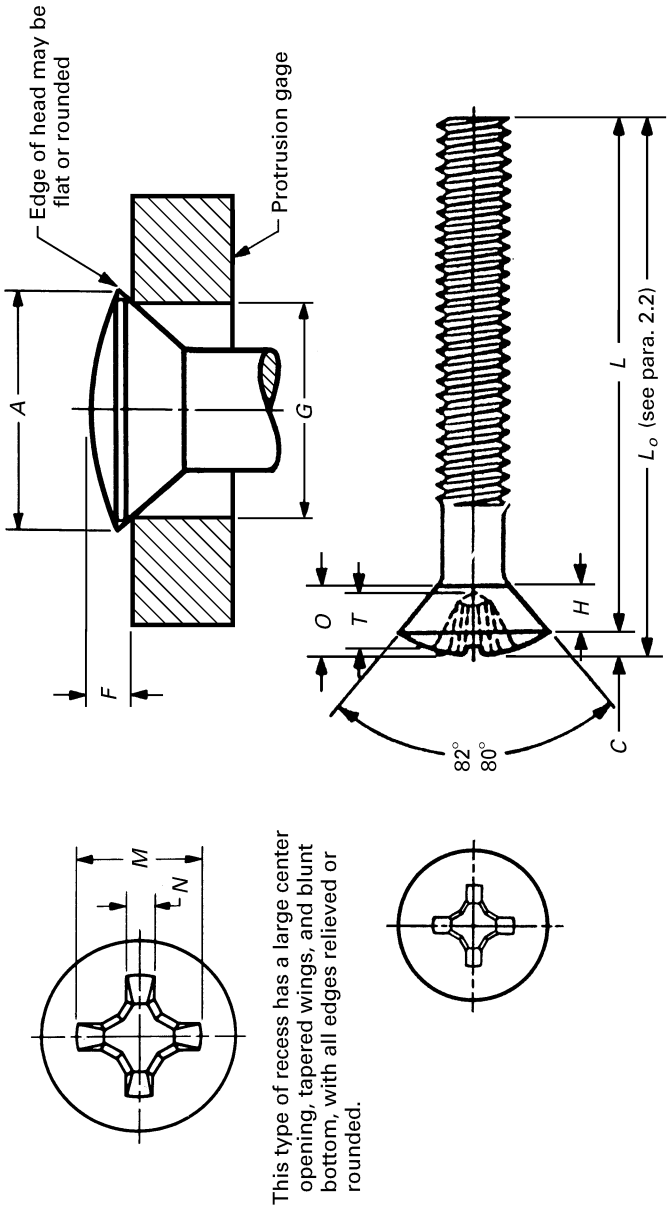
(4) Tabulated values determined from formula for maximum *O* in Appendix A.

(5) No tolerance for gaging diameter is given. If the gaging diameter of the gage used differs from tabulated value, the protrusion will be affected accordingly and the proper protrusion values must be recalculated using the formulas shown in Appendix I.

(6) Not practical to gage.

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Table 4B Illustration



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Table 4B Dimensions of Type I Cross Recessed Oval Countersunk Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]		Length, *L* [Note (2)]	Head Diameter, *A*		Head Side Height, *H*, Ref. [Note (3)]	Head Crown Height, *C*, Ref.	Total Head Height, *O*, Ref. [Note (4)]	Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size	Recess Penetration Gaging Depth		Protrusion Above Gaging Diameter, *F* [Note (5)]		Gaging Diameter, *G* [Note (5)]
		[Note (2)]	Max.	Min.	[Note (3)]	*C*, Ref.	[Note (4)]	*M*, Ref.	*T*, Ref.	*N*, Ref.	Size	Max.	Min.	Max.	Min.	[Note (5)]
0	0.0600	1/8	0.112	0.096	0.035	0.021	0.056	0.068	0.036	0.014	0	0.038	0.020	0.047	0.031	0.078
1	0.0730	1/8	0.137	0.120	0.043	0.025	0.068	0.070	0.039	0.015	0	0.041	0.023	0.053	0.035	0.101
2	0.0860	1/8	0.162	0.144	0.051	0.029	0.080	0.106	0.060	0.018	1	0.062	0.045	0.058	0.039	0.124
3	0.0990	1/8	0.187	0.167	0.059	0.033	0.092	0.118	0.072	0.019	1	0.074	0.057	0.064	0.044	0.148
4	0.1120	3/16	0.212	0.191	0.067	0.037	0.104	0.130	0.086	0.019	1	0.087	0.070	0.069	0.048	0.172
5	0.1250	3/16	0.237	0.215	0.075	0.041	0.116	0.152	0.073	0.028	2	0.074	0.050	0.075	0.053	0.196
6	0.1380	3/16	0.262	0.238	0.083	0.045	0.128	0.172	0.092	0.030	2	0.094	0.069	0.080	0.057	0.220
8	0.1640	1/4	0.312	0.285	0.100	0.052	0.152	0.186	0.107	0.031	2	0.108	0.084	0.091	0.066	0.267
10	0.1900	5/16	0.362	0.333	0.116	0.060	0.176	0.202	0.125	0.033	2	0.126	0.102	0.102	0.075	0.313
12	0.2160	3/8	0.412	0.380	0.132	0.068	0.200	0.264	0.140	0.038	3	0.135	0.111	0.113	0.084	0.362
1/4	0.2500	7/16	0.477	0.442	0.153	0.079	0.232	0.284	0.160	0.040	3	0.156	0.131	0.129	0.095	0.424
5/16	0.3125	1/2	0.597	0.556	0.191	0.099	0.290	0.384	0.226	0.065	4	0.218	0.194	0.155	0.117	0.539
3/8	0.3750	9/16	0.717	0.670	0.230	0.117	0.347	0.404	0.245	0.068	4	0.237	0.213	0.182	0.139	0.653
7/16	0.4375	5/8	0.760	0.715	0.223	0.122	0.345	0.416	0.257	0.070	4	0.249	0.225	0.195	0.150	0.690
1/2	0.5000	3/4	0.815	0.765	0.223	0.131	0.354	0.430	0.271	0.071	4	0.263	0.239	0.212	0.163	0.739
9/16	0.5625	. . .	0.932	0.878	0.260	0.150	0.410	0.462	0.304	0.075	4	0.296	0.272	0.239	0.184	0.851
5/8	0.6250	. . .	1.050	0.990	0.298	0.169	0.467	0.580	0.340	0.081	5	0.323	0.291	0.266	0.206	0.962
3/4	0.7500	. . .	1.285	1.215	0.372	0.206	0.578	0.642	0.406	0.088	5	0.388	0.357	0.318	0.251	1.186

GENERAL NOTES:

(a) For additional requirements, refer to para. 2.

(b) For reference, see Table 4B Illustration on previous page.

NOTES:

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

(2) Screws of these lengths and shorter shall have undercut heads as shown in Table 6B.

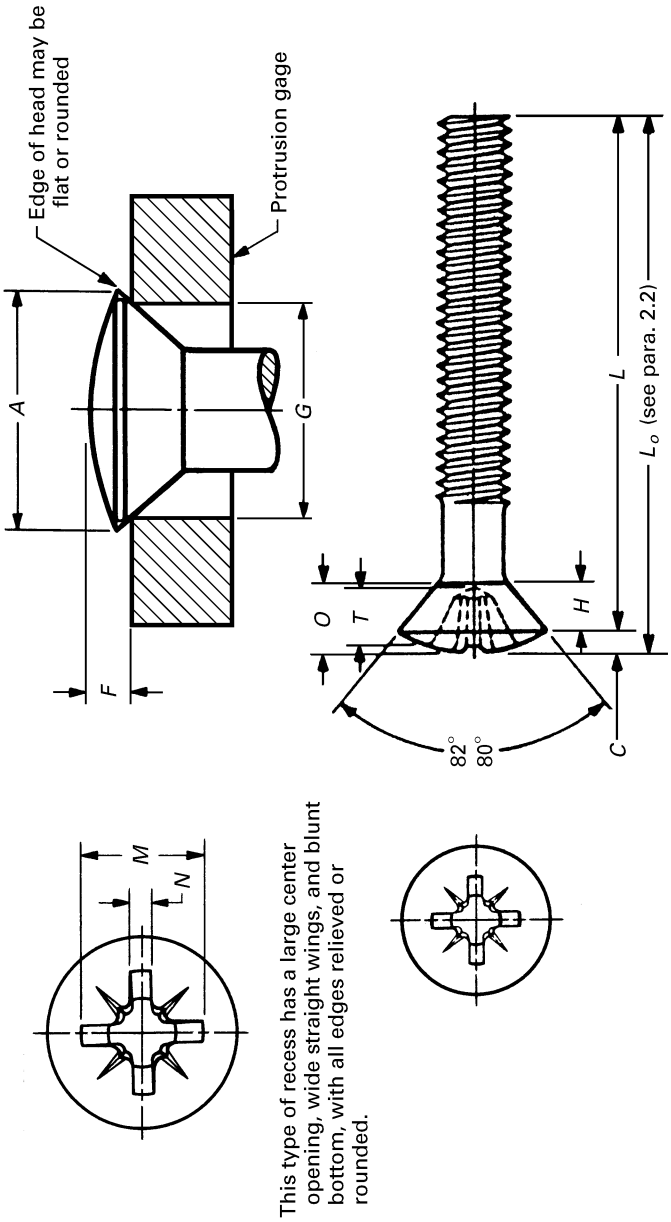
(3) Tabulated values determined from formula for maximum *H* in Appendix A.

(4) Tabulated values determined from formula for maximum *O* in Appendix A.

(5) No tolerance for gaging diameter is given. If the gaging diameter of the gage used differs from tabulated value, the protrusion will be affected accordingly and the proper protrusion values must be recalculated using the formulas shown in Appendix I.

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Table 4C Illustration



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Table 4C Dimensions of Type IA Cross Recessed Oval Countersunk Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]		Length, *L* [Note (2)]	Head Diameter, *A*		Head Side Height, *H*, Ref. [Note (3)]	Head Crown Height, *C*, Ref.	Total Head Height, *O*, Ref. [Note (4)]	Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size	Recess Penetration Gaging Depth		Protrusion Above Gaging Diameter, *F* [Note (5)]		Gaging Diameter, *G* [Note (5)]
			Max.	Min.								Max.	Min.	Max.	Min.	
0	0.0600	1/8	0.112	0.096	0.035	0.021	0.056	0.068	0.040	0.018	0	0.042	0.024	0.047	0.031	0.078
1	0.0730	1/8	0.137	0.120	0.043	0.025	0.068	0.070	0.043	0.018	0	0.043	0.027	0.053	0.035	0.101
2	0.0860	1/8	0.162	0.144	0.051	0.029	0.080	0.106	0.065	0.029	1	0.062	0.046	0.058	0.039	0.124
3	0.0990	1/8	0.187	0.167	0.059	0.033	0.092	0.118	0.077	0.030	1	0.074	0.058	0.064	0.044	0.148
4	0.1120	3/16	0.212	0.191	0.067	0.037	0.104	0.130	0.089	0.030	1	0.086	0.070	0.069	0.048	0.172
5	0.1250	3/16	0.237	0.215	0.075	0.041	0.116	0.152	0.080	0.041	2	0.074	0.056	0.075	0.053	0.196
6	0.1380	3/16	0.262	0.238	0.083	0.045	0.128	0.172	0.100	0.041	2	0.093	0.075	0.080	0.057	0.220
8	0.1640	1/4	0.312	0.285	0.100	0.052	0.152	0.186	0.115	0.041	2	0.108	0.090	0.091	0.066	0.267
10	0.1900	5/16	0.362	0.333	0.116	0.060	0.176	0.202	0.132	0.041	2	0.125	0.107	0.102	0.075	0.313
12	0.2160	3/8	0.412	0.380	0.132	0.068	0.200	0.264	0.148	0.056	3	0.135	0.117	0.113	0.084	0.362
1/4	0.2500	7/16	0.477	0.442	0.153	0.079	0.232	0.284	0.168	0.057	3	0.155	0.137	0.129	0.095	0.424
5/16	0.3125	1/2	0.597	0.556	0.191	0.099	0.290	0.384	0.232	0.086	4	0.215	0.197	0.155	0.117	0.539
3/8	0.3750	9/16	0.717	0.670	0.230	0.117	0.347	0.404	0.253	0.086	4	0.235	0.217	0.182	0.139	0.653
7/16	0.4375	5/8	0.760	0.715	0.223	0.122	0.345	0.416	0.265	0.086	4	0.247	0.229	0.195	0.150	0.690
1/2	0.5000	3/4	0.815	0.765	0.223	0.131	0.354	0.430	0.280	0.086	4	0.262	0.244	0.212	0.163	0.739
9/16	0.5625	. . .	0.932	0.878	0.260	0.150	0.410	0.450	0.302	0.087	4	0.285	0.267	0.239	0.184	0.851
5/8	0.6250	. . .	1.050	0.990	0.298	0.169	0.467	0.562	0.328	0.098	5	0.300	0.279	0.266	0.206	0.962
3/4	0.7500	. . .	1.285	1.215	0.372	0.206	0.578	0.624	0.390	0.099	5	0.362	0.341	0.318	0.251	1.186

GENERAL NOTES:

(a) For additional requirements, refer to para. 2.

(b) For reference, see Table 4C Illustration on previous page.

NOTES:

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

(2) Screws of these lengths and shorter shall have undercut heads as shown in Table 6C.

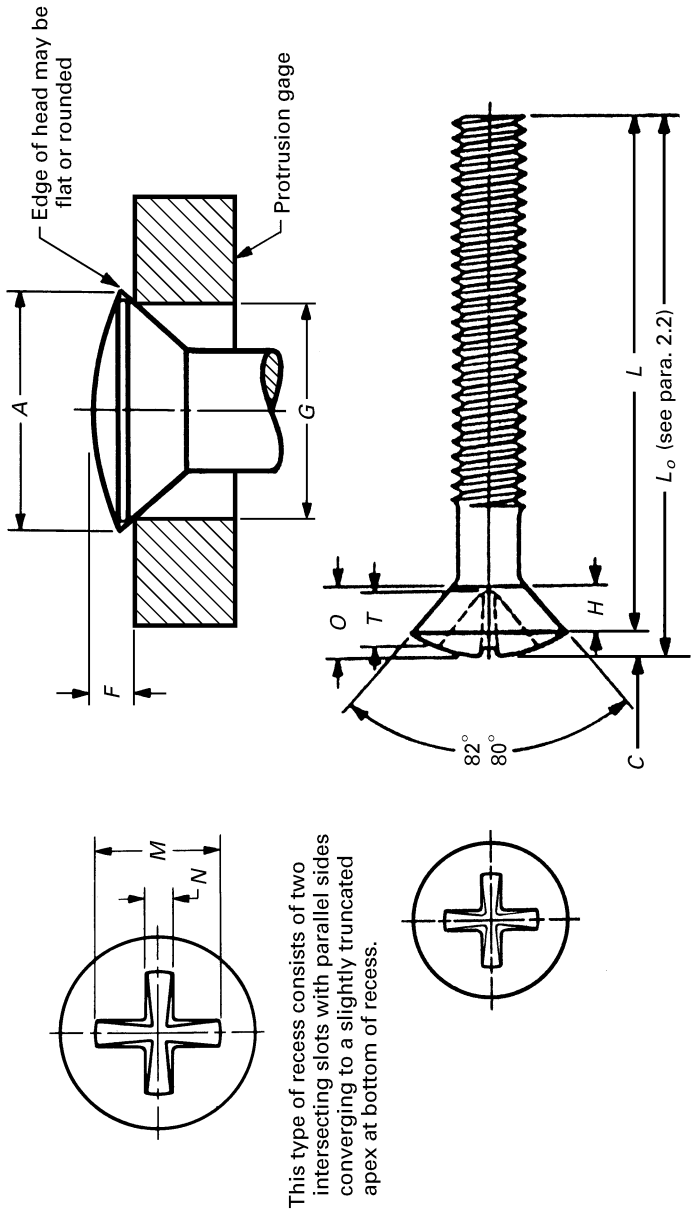
(3) Tabulated values determined from formula for maximum *H* in Appendix A.

(4) Tabulated values determined from formula for maximum *O* in Appendix A.

(5) No tolerance for gaging diameter is given. If the gaging diameter of the gage used differs from tabulated value, the protrusion will be affected accordingly and the proper protrusion values must be recalculated using the formulas shown in Appendix I.

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Table 4D Illustration



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Table 4D Dimensions of Type II Cross Recessed Oval Countersunk Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]	Length, *L* [Note (2)]	Head Diameter, *A*		Head Side Height, *H*, Ref. [Note (3)]	Head Crown Height, *C*, Ref.	Total Head Height, *O*, Ref. [Note (4)]	Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size [Note (5)]	Recess Penetration Gaging Depth		Protrusion Above Gaging Diameter, *F* [Note (6)]		Gaging Diameter, *G* [Note (6)]
		Max.	Min.								Max.	Min.	Max.	Min.	
0 0.0600	1/8	0.112	0.096	0.035	0.021	0.056	0.078	0.036	0.021	...	[Note (7)]	[Note (7)]	0.047	0.031	0.078
1 0.0730	1/8	0.137	0.120	0.043	0.025	0.068	0.092	0.048	0.024	...	[Note (7)]	[Note (7)]	0.053	0.035	0.101
2 0.0860	1/8	0.162	0.144	0.051	0.029	0.080	0.114	0.060	0.027	...	0.040	0.029	0.058	0.039	0.124
3 0.0990	1/8	0.187	0.167	0.059	0.033	0.092	0.133	0.072	0.030	...	0.053	0.041	0.064	0.044	0.148
4 0.1120	3/16	0.212	0.191	0.067	0.037	0.104	0.151	0.082	0.032	...	0.064	0.052	0.069	0.048	0.172
5 0.1250	3/16	0.237	0.215	0.075	0.041	0.116	0.169	0.094	0.035	...	0.077	0.064	0.075	0.053	0.196
6 0.1380	3/16	0.262	0.238	0.083	0.045	0.128	0.188	0.106	0.038	...	0.089	0.075	0.080	0.057	0.220
8 0.1640	1/4	0.312	0.285	0.100	0.052	0.152	0.224	0.124	0.043	...	0.113	0.099	0.091	0.066	0.267
10 0.1900	5/16	0.362	0.333	0.116	0.060	0.176	0.260	0.148	0.048	...	0.137	0.122	0.102	0.075	0.313
12 0.2160	3/8	0.412	0.380	0.132	0.068	0.200	0.297	0.172	0.054	...	0.162	0.145	0.113	0.084	0.362
1/4 0.2500	7/16	0.477	0.442	0.153	0.079	0.232	0.344	0.195	0.061	...	0.193	0.176	0.129	0.095	0.424
5/16 0.3125	1/2	0.597	0.556	0.191	0.099	0.290	0.432	0.252	0.074	...	0.251	0.232	0.155	0.117	0.539
3/8 0.3750	9/16	0.717	0.670	0.230	0.117	0.347	0.509	0.302	0.086	...	0.303	0.281	0.182	0.139	0.653
7/16 0.4375	5/8	0.760	0.715	0.223	0.122	0.345	0.554	0.332	0.092	...	0.332	0.310	0.195	0.150	0.690
1/2 0.5000	3/4	0.815	0.765	0.223	0.131	0.354	0.593	0.358	0.098	...	0.359	0.335	0.212	0.163	0.739
9/16 0.5625	...	0.932	0.878	0.260	0.150	0.410	0.640	0.387	0.104	...	0.389	0.364	0.239	0.184	0.851
5/8 0.6250	...	1.050	0.990	0.298	0.169	0.467	0.640	0.387	0.104	...	0.389	0.364	0.266	0.206	0.962
3/4 0.7500	...	1.285	1.215	0.372	0.206	0.578	0.640	0.387	0.104	...	0.389	0.364	0.318	0.251	1.186

GENERAL NOTES:

(a) For additional requirements, refer to para. 2.

(b) For reference, see Table 4D Illustration on previous page.

NOTES:

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

(2) Screws of these lengths and shorter shall have undercut heads as shown in Table 6D.

(3) Tabulated values determined from formula for maximum *H* in Appendix A.

(4) Tabulated values determined from formula for maximum *O* in Appendix A.

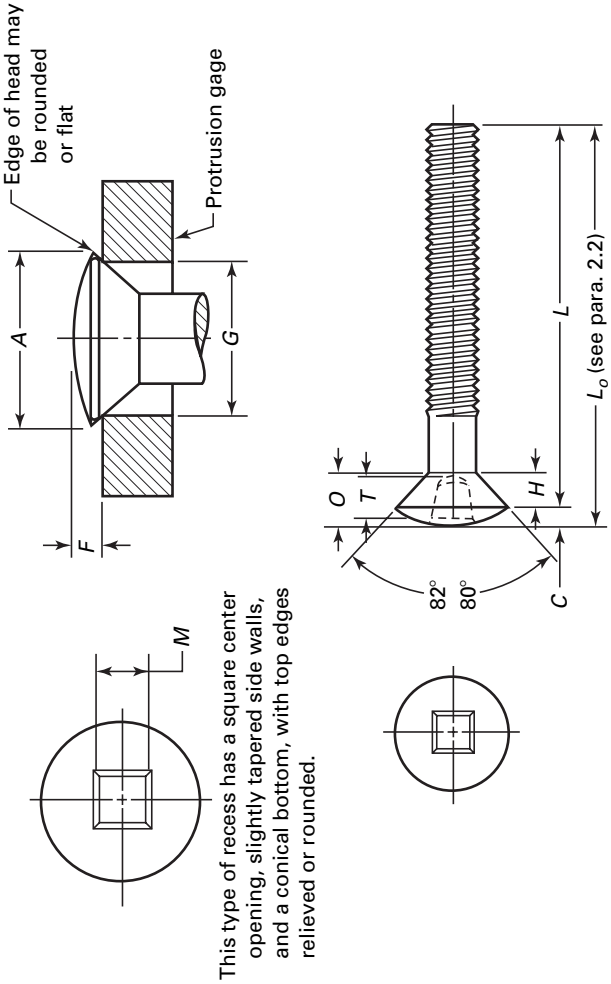
(5) Point same on all drivers.

(6) No tolerance for gaging diameter is given. If the gaging diameter of the gage used differs from tabulated value, the protrusion will be affected accordingly and the proper protrusion values must be recalculated using the formulas shown in Appendix I.

(7) Not practical to gage.

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Table 4E Illustration



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Table 4E Dimensions of Type III Square Recessed Oval Countersunk Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]	Length, *L* [Note (2)]	Head Diameter, *A*		Head Side Height, *H*, Ref. [Note (3)]	Head Crown Height, *C*, Ref.	Total Head Height, *O*, Ref.	Recess Across Flats, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Size [Note (4)]	Recess Penetration Gaging Depth [Note (5)]		Protrusion Above Gaging Diameter, *F* [Note (6)]		Gaging Diameter, *G* [Note (6)]
		Max.	Min.							Max.	Min.	Max.	Min.	
3 0.0990	1/8	0.187	0.167	0.059	0.033	0.092	0.070	0.066	0	0.038	0.028	0.064	0.044	0.148
4 0.1120	3/16	0.212	0.191	0.067	0.037	0.104	0.070	0.066	0	0.038	0.028	0.069	0.048	0.172
5 0.1250	3/16	0.237	0.215	0.075	0.041	0.116	0.091	0.106	1R	0.065	0.050	0.075	0.053	0.196
6 0.1380	3/16	0.262	0.238	0.083	0.045	0.128	0.091	0.106	1R	0.065	0.050	0.080	0.057	0.220
8 0.1640	1/4	0.312	0.285	0.100	0.052	0.152	0.112	0.127	2R	0.075	0.060	0.091	0.066	0.267
10 0.1900	5/16	0.362	0.333	0.116	0.060	0.176	0.112	0.127	2R	0.075	0.060	0.102	0.075	0.313
12 0.2160	3/8	0.412	0.380	0.132	0.068	0.200	0.133	0.158	3R	0.095	0.080	0.113	0.084	0.362
1/4 0.2500	7/16	0.477	0.442	0.153	0.079	0.232	0.133	0.158	3R	0.095	0.080	0.129	0.095	0.424
5/16 0.3125	1/2	0.597	0.556	0.191	0.099	0.290	0.191	0.194	4R	0.100	0.085	0.155	0.117	0.539
3/8 0.3750	9/16	0.717	0.670	0.230	0.117	0.347	0.191	0.194	4R	0.100	0.085	0.182	0.139	0.653

GENERAL NOTES:

(a) For additional requirements, refer to para. 2.

(b) For reference, see Table 4E Illustration on previous page.

NOTES:

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

(2) Screws of these lengths and shorter shall have undercut heads as shown in Table 6E.

(3) Tabulated values determined from formula for maximum *H* in Appendix A.

(4) "R" in the recess size tabulation means regular depth recess.

(5) Square recesses incorporate a slight taper on the sides of the recess. This taper can result in loss of penetration gaging depth on finished fasteners due to the build up of plating in the recesses. The recess penetration dimensions specified here are for finished (plated) product. Manufacturers should be advised that they should not use all this tolerance in the heading process, or an out of tolerance condition could exist after plating.

(6) No tolerance for gaging diameter is given. If the gaging diameter of the gage used differs from this tabulated value, the protrusion will be affected accordingly and the proper protrusion values must be recalculated using the formulas shown in Appendix I.

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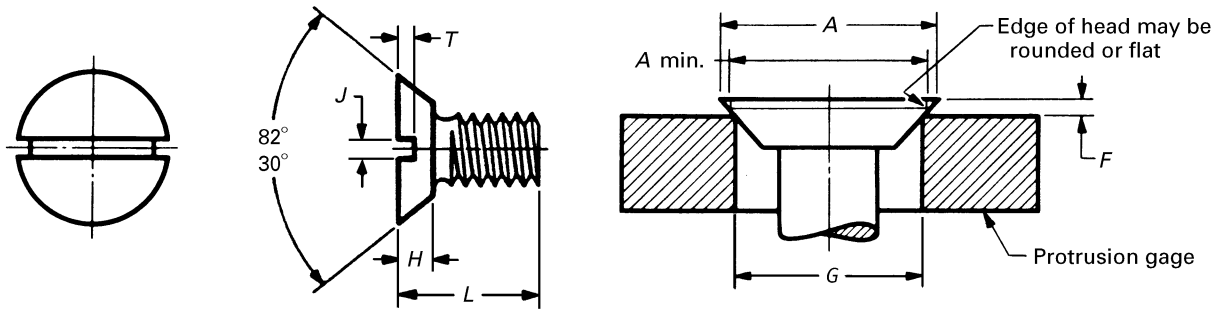


Table 5A Dimensions of Slotted Undercut Flat Countersunk Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]	Length, *L* [Note (2)]	Head Diameter, *A*		Head Height, *H*		Slot Width, *J*		Slot Depth, *T*		Protrusion Above Gaging Diameter, *F* [Note (3)]		Gaging Diameter, *G* [Note (3)]
		Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	
0 0.0600	1/8	0.112	0.096	0.025	0.018	0.023	0.016	0.011	0.007	[Note (4)]	[Note (4)]	[Note (4)]
1 0.0730	1/8	0.137	0.120	0.031	0.023	0.026	0.019	0.014	0.009	[Note (4)]	[Note (4)]	[Note (4)]
2 0.0860	1/8	0.162	0.144	0.036	0.028	0.031	0.023	0.016	0.011	0.029	0.017	0.124
3 0.0990	1/8	0.187	0.167	0.042	0.033	0.035	0.027	0.019	0.012	0.031	0.018	0.148
4 0.1120	3/16	0.212	0.191	0.047	0.038	0.039	0.031	0.022	0.014	0.032	0.019	0.172
5 0.1250	3/16	0.237	0.215	0.053	0.043	0.043	0.035	0.024	0.016	0.034	0.020	0.196
6 0.1380	3/16	0.262	0.238	0.059	0.048	0.048	0.039	0.027	0.017	0.036	0.021	0.220
8 0.1640	1/4	0.312	0.285	0.070	0.058	0.054	0.045	0.032	0.021	0.039	0.023	0.267
10 0.1900	5/16	0.362	0.333	0.081	0.068	0.060	0.050	0.037	0.024	0.042	0.025	0.313
12 0.2160	3/8	0.412	0.380	0.092	0.078	0.067	0.056	0.043	0.028	0.045	0.027	0.362
1/4 0.2500	7/16	0.477	0.442	0.107	0.092	0.075	0.064	0.050	0.032	0.050	0.029	0.424
5/16 0.3125	1/2	0.597	0.556	0.134	0.116	0.084	0.072	0.062	0.041	0.057	0.034	0.539
3/8 0.3750	9/16	0.717	0.670	0.161	0.140	0.094	0.081	0.075	0.049	0.065	0.039	0.653
7/16 0.4375	5/8	0.760	0.715	0.156	0.133	0.094	0.081	0.072	0.045	0.073	0.044	0.690
1/2 0.5000	3/4	0.815	0.765	0.156	0.130	0.106	0.091	0.072	0.046	0.081	0.049	0.739

GENERAL NOTE: For additional requirements, refer to para. 2.

NOTES:

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

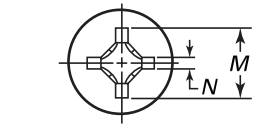
(2) Screws of these lengths and shorter are undercut. Screws of longer lengths shall have head heights as shown in Table 1A.

(3) No tolerance for gaging diameter is given. If the gaging diameter of the gage used differs from tabulated value, the protrusion will be affected accordingly and the proper protrusion values must be recalculated using the formulas shown in Appendix I.

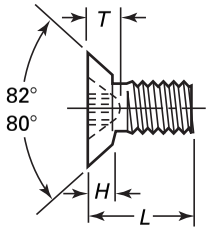
(4) Not practical to gage.

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This type of recess has a large center opening, tapered wings, and blunt bottom, with all edges relieved or rounded.



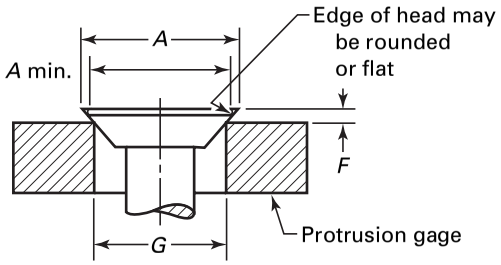


Table 5B Dimensions of Type I Cross Recessed Undercut Flat Countersunk Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]		Length, *L* [Note (2)]	Head Diameter, *A*		Head Height, *H*		Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size	Recess Penetration Gaging Depth		Protrusion Above Gaging Diameter, *F* [Note (3)]		Gaging Diameter, *G* [Note (3)]
			Max.	Min.	Max.	Min.					Max.	Min.	Max.	Min.	
0	0.0600	1/8	0.112	0.096	0.025	0.018	0.062	0.035	0.014	0	0.036	0.020	[Note (4)]	[Note (4)]	[Note (4)]
1	0.0730	1/8	0.137	0.120	0.031	0.023	0.070	0.043	0.015	0	0.044	0.028	[Note (4)]	[Note (4)]	[Note (4)]
2	0.0860	1/8	0.162	0.144	0.036	0.028	0.088	0.048	0.017	1	0.049	0.033	0.029	0.017	0.124
3	0.0990	1/8	0.187	0.167	0.042	0.033	0.096	0.055	0.018	1	0.056	0.040	0.031	0.018	0.148
4	0.1120	3/16	0.212	0.191	0.047	0.038	0.110	0.070	0.018	1	0.071	0.055	0.032	0.019	0.172
5	0.1250	3/16	0.237	0.215	0.053	0.043	0.122	0.081	0.018	1	0.082	0.066	0.034	0.020	0.196
6	0.1380	3/16	0.262	0.238	0.059	0.048	0.140	0.066	0.025	2	0.067	0.044	0.036	0.021	0.220
8	0.1640	1/4	0.312	0.285	0.070	0.058	0.168	0.094	0.029	2	0.095	0.072	0.039	0.023	0.267
10	0.1900	5/16	0.362	0.333	0.081	0.068	0.182	0.110	0.030	2	0.110	0.087	0.042	0.025	0.313
12	0.2160	3/8	0.412	0.380	0.092	0.078	0.226	0.110	0.030	3	0.104	0.081	0.045	0.027	0.362
1/4	0.2500	7/16	0.477	0.442	0.107	0.092	0.244	0.124	0.032	3	0.119	0.096	0.050	0.029	0.424
5/16	0.3125	1/2	0.597	0.556	0.134	0.116	0.310	0.157	0.053	4	0.148	0.126	0.057	0.034	0.539
3/8	0.3750	9/16	0.717	0.670	0.161	0.140	0.358	0.205	0.061	4	0.196	0.174	0.065	0.039	0.653
7/16	0.4375	5/8	0.760	0.715	0.156	0.133	0.386	0.234	0.065	4	0.225	0.203	0.073	0.044	0.690
1/2	0.5000	3/4	0.815	0.765	0.156	0.130	0.402	0.252	0.068	4	0.241	0.219	0.081	0.049	0.739

GENERAL NOTE: For additional requirements, refer to para. 2.

NOTES:

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

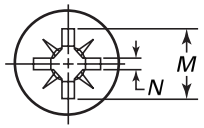
(2) Screws of these lengths and shorter are undercut. Screws of longer lengths shall have head heights as shown in Table 1B.

(3) No tolerance for gaging diameter is given. If the gaging diameter of the gage used differs from tabulated value, the protrusion will be affected accordingly and the proper protrusion values must be recalculated using the formulas shown in Appendix I.

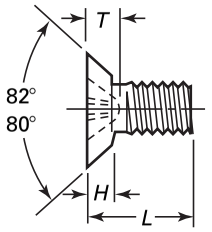
(4) Not practical to gage.

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This type of recess has a large center opening, wide straight wings, and blunt bottom, with all edges relieved or rounded.



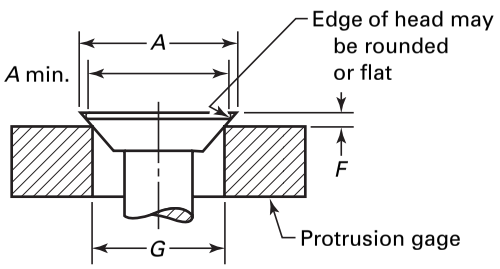


Table 5C Dimensions of Type IA Cross Recessed Undercut Flat Countersunk Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]	Length, *L* [Note (2)]	Head Diameter, *A*		Head Height, *H*		Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size	Recess Penetration Gaging Depth		Protrusion Above Gaging Diameter, *F* [Note (3)]		Gaging Diameter, *G* [Note (3)]
		Max.	Min.	Max.	Min.					Max.	Min.	Max.	Min.	
0 0.0600	1/8	0.112	0.096	0.025	0.018	0.062	0.036	0.018	0	0.037	0.021	[Note (4)]	[Note (4)]	[Note (4)]
1 0.0730	1/8	0.137	0.120	0.031	0.023	0.070	0.044	0.018	0	0.045	0.029	[Note (4)]	[Note (4)]	[Note (4)]
2 0.0860	1/8	0.162	0.144	0.036	0.028	0.088	0.048	0.028	1	0.046	0.030	0.029	0.017	0.124
3 0.0990	1/8	0.187	0.167	0.042	0.033	0.096	0.055	0.029	1	0.053	0.037	0.031	0.018	0.148
4 0.1120	3/16	0.212	0.191	0.047	0.038	0.110	0.070	0.029	1	0.068	0.052	0.032	0.019	0.172
5 0.1250	3/16	0.237	0.215	0.053	0.043	0.122	0.081	0.030	1	0.079	0.063	0.034	0.020	0.196
6 0.1380	3/16	0.262	0.238	0.059	0.048	0.140	0.069	0.040	2	0.063	0.045	0.036	0.021	0.220
8 0.1640	1/4	0.312	0.285	0.070	0.058	0.168	0.098	0.041	2	0.091	0.073	0.039	0.023	0.267
10 0.1900	5/16	0.362	0.333	0.081	0.068	0.182	0.112	0.041	2	0.107	0.089	0.042	0.025	0.313
12 0.2160	3/8	0.412	0.380	0.092	0.078	0.226	0.112	0.055	3	0.100	0.082	0.045	0.027	0.362
1/4 0.2500	7/16	0.477	0.442	0.107	0.092	0.242	0.128	0.056	3	0.115	0.097	0.050	0.029	0.424
5/16 0.3125	1/2	0.597	0.556	0.134	0.116	0.310	0.163	0.085	4	0.145	0.127	0.057	0.034	0.539
3/8 0.3750	9/16	0.717	0.670	0.161	0.140	0.358	0.211	0.086	4	0.193	0.175	0.065	0.039	0.653
7/16 0.4375	5/8	0.760	0.715	0.156	0.133	0.386	0.239	0.086	4	0.222	0.204	0.073	0.044	0.690
1/2 0.5000	3/4	0.815	0.765	0.156	0.130	0.402	0.256	0.086	4	0.238	0.220	0.081	0.049	0.739

GENERAL NOTE: For additional requirements, refer to para. 2.

NOTES:

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

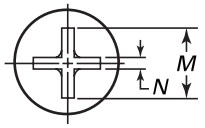
(2) Screws of these lengths and shorter are undercut. Screws of longer lengths shall have head heights as shown in Table 1C.

(3) No tolerance for gaging diameter is given. If the gaging diameter of the gage used differs from tabulated value, the protrusion will be affected accordingly and the proper protrusion values must be recalculated using the formulas shown in Appendix I.

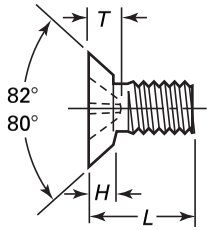
(4) Not practical to gage.

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This type of recess consists of two intersecting slots with parallel sides converging to a slightly truncated apex at bottom of recess.



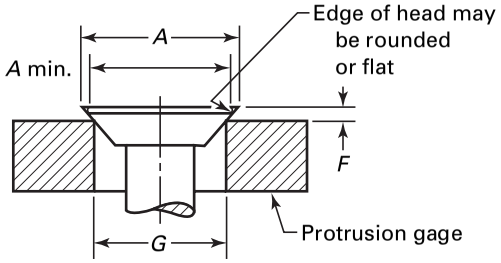


Table 5D Dimensions of Type II Cross Recessed Undercut Flat Countersunk Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]		Length, *L* [Note (2)]	Head Diameter, *A*		Head Height, *H*		Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size [Note (3)]	Recess Penetration Gaging Depth		Protrusion Above Gaging Diameter, *F* [Note (4)]		Gaging Diameter, *G* [Note (4)]
			Max.	Min.	Max.	Min.					Max.	Min.	Max.	Min.	
0	0.0600	1/8	0.112	0.096	0.025	0.018	0.067	0.029	0.020	. . .	[Note (5)]	[Note (5)]	[Note (5)]	[Note (5)]	[Note (5)]
1	0.0730	1/8	0.137	0.120	0.031	0.023	0.082	0.039	0.022	. . .	[Note (5)]	[Note (5)]	[Note (5)]	[Note (5)]	[Note (5)]
2	0.0860	1/8	0.162	0.144	0.036	0.028	0.100	0.050	0.025	. . .	0.030	0.020	0.029	0.017	0.124
3	0.0990	1/8	0.187	0.167	0.042	0.033	0.111	0.058	0.026	. . .	0.038	0.027	0.031	0.018	0.148
4	0.1120	3/16	0.212	0.191	0.047	0.038	0.129	0.070	0.029	. . .	0.050	0.038	0.032	0.019	0.172
5	0.1250	3/16	0.237	0.215	0.053	0.043	0.147	0.080	0.032	. . .	0.062	0.050	0.034	0.020	0.196
6	0.1380	3/16	0.262	0.238	0.059	0.048	0.161	0.088	0.034	. . .	0.071	0.059	0.036	0.021	0.220
8	0.1640	1/4	0.312	0.285	0.070	0.058	0.197	0.112	0.039	. . .	0.095	0.082	0.039	0.023	0.267
10	0.1900	5/16	0.362	0.333	0.081	0.068	0.236	0.132	0.045	. . .	0.121	0.107	0.042	0.025	0.313
12	0.2160	3/8	0.412	0.380	0.092	0.078	0.260	0.148	0.048	. . .	0.137	0.122	0.045	0.027	0.362
1/4	0.2500	7/16	0.477	0.442	0.107	0.092	0.304	0.169	0.054	. . .	0.167	0.150	0.050	0.029	0.424
5/16	0.3125	1/2	0.597	0.556	0.134	0.116	0.381	0.218	0.066	. . .	0.218	0.198	0.057	0.034	0.539
3/8	0.3750	9/16	0.717	0.670	0.161	0.140	0.453	0.266	0.077	. . .	0.266	0.244	0.065	0.039	0.653
7/16	0.4375	5/8	0.760	0.715	0.156	0.133	0.498	0.295	0.083	. . .	0.296	0.273	0.073	0.044	0.690
1/2	0.5000	3/4	0.815	0.765	0.156	0.130	0.548	0.328	0.090	. . .	0.329	0.305	0.081	0.049	0.739

GENERAL NOTE: For additional requirements, refer to para. 2.

NOTES:

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

(2) Screws of these lengths and shorter are undercut. Screws of longer lengths shall have head heights as shown in Table 1D.

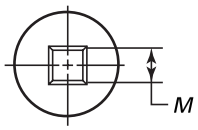
(3) Point same on all drivers.

(4) No tolerance for gaging diameter is given. If the gaging diameter of the gage used differs from tabulated value, the protrusion will be affected accordingly and the proper protrusion values must be recalculated using the formulas shown in Appendix I.

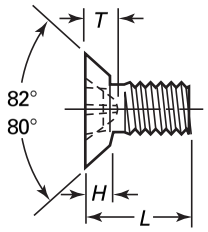
(5) Not practical to gage.

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This type of recess has a square center opening, slightly tapered side walls, and a conical bottom, with top edges relieved or rounded.



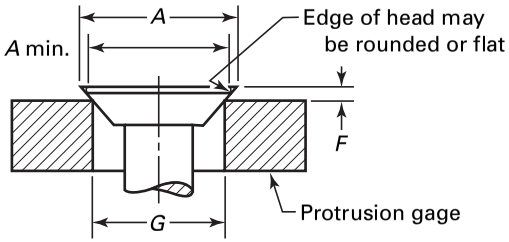


Table 5E Dimensions of Type III Square Recessed Undercut Flat Countersunk Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]		Length, *L* [Note (2)]	Head Diameter, *A*		Head Height, *H*, [Note (3)]		Recess Across Flats, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Size [Note (4)]	Recess Penetration Gaging Depth, *P*, [Note (5)]		Protrusion Above Gaging Diameter, *F*, [Note (6)]		Gaging Diameter, *G* [Note (6)]
			Max.	Min.	Max.	Min.				Max.	Min.	Max.	Min.	
4	0.1120	3/16	0.212	0.191	0.047	0.038	0.050	0.057	00	0.033	0.028	0.032	0.019	0.172
5	0.1250	3/16	0.237	0.215	0.053	0.043	0.070	0.066	0	0.038	0.028	0.034	0.020	0.196
6	0.1380	3/16	0.262	0.238	0.059	0.048	0.091	0.070	1SS	0.027	0.017	0.036	0.021	0.220
8	0.1640	1/4	0.312	0.285	0.070	0.058	0.112	0.091	2SS	0.037	0.027	0.039	0.023	0.267
10	0.1900	5/16	0.362	0.333	0.081	0.068	0.112	0.091	2SS	0.037	0.027	0.042	0.025	0.313
12	0.2160	3/8	0.412	0.380	0.092	0.078	0.133	0.138	3SS	0.073	0.063	0.045	0.027	0.362
1/4	0.2500	7/16	0.477	0.442	0.107	0.092	0.133	0.143	3S	0.080	0.065	0.050	0.029	0.424
5/16	0.3125	1/2	0.597	0.556	0.134	0.116	0.191	0.194	4R	0.100	0.085	0.057	0.034	0.539
3/8	0.3750	9/16	0.717	0.670	0.161	0.140	0.191	0.194	4R	0.100	0.085	0.065	0.039	0.653

GENERAL NOTE: For additional requirements, refer to para. 2.

NOTES:

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

(2) Screws of these lengths and shorter shall have undercut heads. Screws of longer lengths shall have head heights as shown in Table 1E.

(3) Tabulated values determined from formula for maximum *H*, Appendix A.

(4) "R" in the recess size tabulation means regular depth recess, the "S" means short depth recess, and the "SS" means "short-short" depth recess.

(5) Square recesses incorporate a slight taper on the sides of the recess. This taper can result in loss of penetration gaging depth on finished fasteners due to the build up of plating in the recesses. The recess penetration dimensions specified here are for finished (plated) product. Manufacturers should be advised that they should not use all this tolerance in the heading process, or an out of tolerance condition could exist after plating.

(6) No tolerance for gaging diameter is given. If the gaging diameter of the gage used differs from this tabulated value, the protrusion will be affected accordingly, and the proper protrusion values must be recalculated using the formulas shown in Appendix I.

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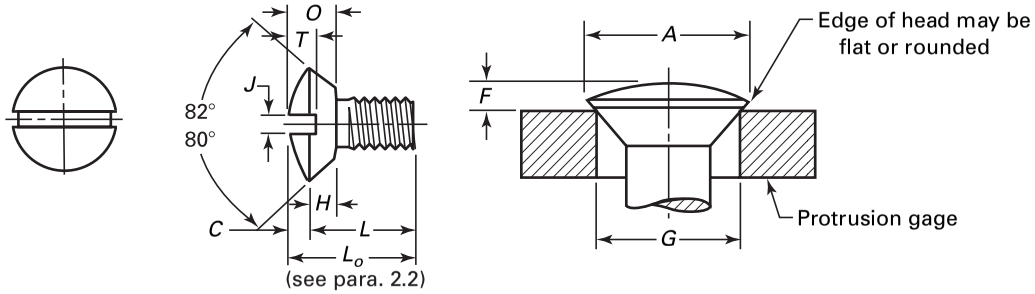


Table 6A Dimensions of Slotted Undercut Oval Countersunk Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]		Length, *L* [Note (2)]	Head Diameter, *A*		Head Side Height, *H*, Ref. [Note (3)]	Head Crown Height, *C*, Ref.	Total Head Height, *O*		Slot Width, *J*		Slot Depth, *T*		Protrusion Above Gaging Diameter, *F* [Note (4)]		Gaging Diameter, *G* [Note (4)]
			Max.	Min.			Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	
0	0.0600	1/8	0.112	0.096	0.025	0.021	0.046	0.033	0.023	0.016	0.028	0.022	0.047	0.031	0.078
1	0.0730	1/8	0.137	0.120	0.031	0.025	0.056	0.042	0.026	0.019	0.034	0.027	0.053	0.035	0.101
2	0.0860	1/8	0.162	0.144	0.036	0.029	0.065	0.050	0.031	0.023	0.040	0.033	0.058	0.039	0.124
3	0.0990	1/8	0.187	0.167	0.042	0.033	0.075	0.059	0.035	0.027	0.047	0.038	0.064	0.044	0.148
4	0.1120	3/16	0.212	0.191	0.047	0.037	0.084	0.067	0.039	0.031	0.053	0.043	0.069	0.048	0.172
5	0.1250	3/16	0.237	0.215	0.053	0.041	0.094	0.076	0.043	0.035	0.059	0.048	0.075	0.053	0.196
6	0.1380	3/16	0.262	0.238	0.059	0.045	0.104	0.084	0.048	0.039	0.065	0.053	0.080	0.057	0.220
8	0.1640	1/4	0.312	0.285	0.070	0.052	0.123	0.101	0.054	0.045	0.078	0.064	0.091	0.066	0.267
10	0.1900	5/16	0.362	0.333	0.081	0.060	0.142	0.118	0.060	0.050	0.090	0.074	0.102	0.075	0.313
12	0.2160	3/8	0.412	0.380	0.092	0.068	0.161	0.135	0.067	0.056	0.103	0.085	0.113	0.084	0.362
1/4	0.2500	7/16	0.477	0.442	0.107	0.079	0.186	0.158	0.075	0.064	0.119	0.098	0.129	0.095	0.424
5/16	0.3125	1/2	0.597	0.556	0.134	0.099	0.232	0.198	0.084	0.072	0.149	0.124	0.155	0.117	0.539
3/8	0.3750	9/16	0.717	0.670	0.161	0.117	0.278	0.239	0.094	0.081	0.179	0.149	0.182	0.139	0.653
7/16	0.4375	5/8	0.760	0.715	0.156	0.122	0.279	0.239	0.094	0.081	0.184	0.154	0.195	0.150	0.690
1/2	0.5000	3/4	0.815	0.765	0.156	0.131	0.288	0.244	0.106	0.091	0.204	0.169	0.212	0.163	0.739

GENERAL NOTE: For additional requirements, refer to para. 2.

NOTES:

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

(2) Screws of these lengths and shorter are undercut. Screws of longer lengths shall have head heights as shown in Table 4A.

(3) Tabulated values determined from formula for maximum *H* in Appendix A.

(4) No tolerance for gaging diameter is given. If the gaging diameter of the gage used differs from tabulated value, the protrusion will be affected accordingly and the proper protrusion values must be recalculated using the formulas shown in Appendix I.

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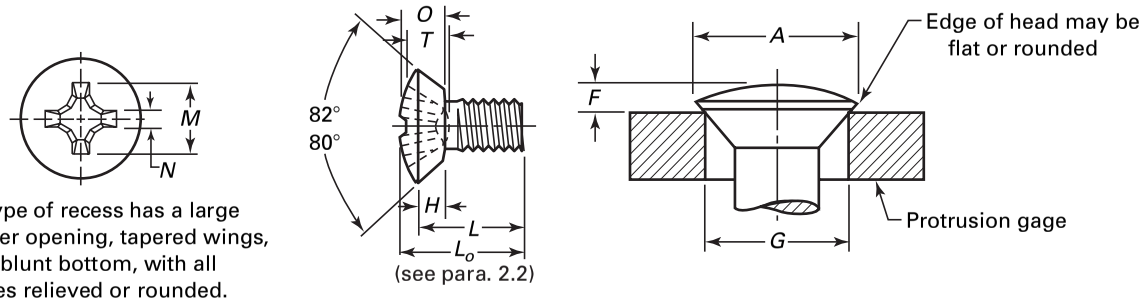


Table 6B Dimensions of Type I Cross Recessed Undercut Oval Countersunk Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]		Length, *L* [Note (2)]	Head Diameter, *A*		Head Side Height, *H*, Ref. [Note (3)]	Head Crown Height, *C*, Ref.	Total Head Height, *O*		Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size	Recess Penetration Gaging Depth		Protrusion Above Gaging Diameter, *F* [Note (4)]		Gaging Diameter, *G* [Note (4)]
			Max.	Min.			Max.	Min.					Max.	Min.	Max.	Min.	
0	0.0600	1/8	0.112	0.096	0.025	0.021	0.046	0.033	0.068	0.036	0.014	0	0.038	0.020	0.047	0.031	0.078
1	0.0730	1/8	0.137	0.120	0.031	0.025	0.056	0.042	0.070	0.039	0.015	0	0.041	0.023	0.053	0.035	0.101
2	0.0860	1/8	0.162	0.144	0.036	0.029	0.065	0.050	0.106	0.060	0.018	1	0.062	0.045	0.058	0.039	0.124
3	0.0990	1/8	0.187	0.167	0.042	0.033	0.075	0.059	0.118	0.072	0.019	1	0.074	0.057	0.064	0.044	0.148
4	0.1120	3/16	0.212	0.191	0.047	0.037	0.084	0.067	0.130	0.086	0.019	1	0.087	0.070	0.069	0.048	0.172
5	0.1250	3/16	0.237	0.215	0.053	0.041	0.094	0.076	0.152	0.073	0.028	2	0.074	0.050	0.075	0.053	0.196
6	0.1380	3/16	0.262	0.238	0.059	0.045	0.104	0.084	0.172	0.092	0.030	2	0.094	0.069	0.080	0.057	0.220
8	0.1640	1/4	0.312	0.285	0.070	0.052	0.123	0.101	0.186	0.107	0.031	2	0.108	0.084	0.091	0.066	0.267
10	0.1900	5/16	0.362	0.333	0.081	0.060	0.142	0.118	0.202	0.125	0.033	2	0.126	0.102	0.102	0.075	0.313
12	0.2160	3/8	0.412	0.380	0.092	0.068	0.161	0.135	0.264	0.140	0.038	3	0.135	0.111	0.113	0.084	0.362
1/4	0.2500	7/16	0.477	0.442	0.107	0.079	0.186	0.158	0.284	0.160	0.040	3	0.156	0.131	0.129	0.095	0.424
5/16	0.3125	1/2	0.597	0.556	0.134	0.099	0.232	0.198	0.374	0.214	0.064	4	0.206	0.182	0.155	0.117	0.539
3/8	0.3750	9/16	0.717	0.670	0.161	0.117	0.278	0.239	0.394	0.233	0.066	4	0.225	0.201	0.182	0.139	0.653
7/16	0.4375	5/8	0.760	0.715	0.156	0.122	0.279	0.239	0.404	0.245	0.068	4	0.237	0.213	0.195	0.150	0.690
1/2	0.5000	3/4	0.815	0.765	0.156	0.131	0.288	0.244	0.416	0.257	0.070	4	0.249	0.225	0.212	0.163	0.739

GENERAL NOTE: For additional requirements, refer to para. 2.

NOTES:

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

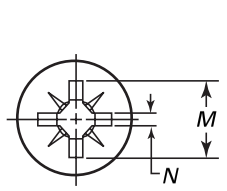
(2) Screws of these lengths and shorter are undercut. Screws of longer lengths shall have head heights as shown in Table 4B.

(3) Tabulated values determined from formula for maximum *H* in Appendix A.

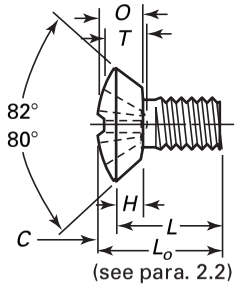
(4) No tolerance for gaging diameter is given. If the gaging diameter of the gage used differs from tabulated value, the protrusion will be affected accordingly and the proper protrusion values must be recalculated using the formulas shown in Appendix I.

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This type of recess has a large center opening, wide straight wings, and blunt bottom, with all edges relieved or rounded.



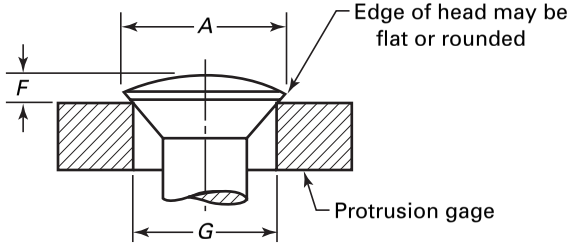


Table 6C Dimensions of Type IA Cross Recessed Undercut Oval Countersunk Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]		Length, *L* [Note (2)]	Head Diameter, *A*		Head Side Height, *H*, Ref. [Note (3)]	Head Crown Height, *C*, Ref.	Total Head Height, *O*		Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size	Recess Penetration Gaging Depth		Protrusion Above Gaging Diameter, *F* [Note (4)]		Gaging Diameter, *G* [Note (4)]
			Max.	Min.			Max.	Min.					Max.	Min.	Max.	Min.	
0	0.0600	1/8	0.112	0.096	0.025	0.021	0.046	0.033	0.068	0.040	0.018	0	0.040	0.024	0.047	0.031	0.078
1	0.0730	1/8	0.137	0.120	0.031	0.025	0.056	0.042	0.070	0.043	0.018	0	0.043	0.027	0.053	0.035	0.101
2	0.0860	1/8	0.162	0.144	0.036	0.029	0.065	0.050	0.106	0.065	0.029	1	0.062	0.046	0.058	0.039	0.124
3	0.0990	1/8	0.187	0.167	0.042	0.033	0.075	0.059	0.118	0.077	0.030	1	0.074	0.058	0.064	0.044	0.148
4	0.1120	3/16	0.212	0.191	0.047	0.037	0.084	0.067	0.130	0.089	0.030	1	0.086	0.070	0.069	0.048	0.172
5	0.1250	3/16	0.237	0.215	0.053	0.041	0.094	0.076	0.152	0.080	0.041	2	0.074	0.056	0.075	0.053	0.196
6	0.1380	3/16	0.262	0.238	0.059	0.045	0.104	0.084	0.172	0.100	0.041	2	0.093	0.075	0.080	0.057	0.220
8	0.1640	1/4	0.312	0.285	0.070	0.052	0.123	0.101	0.186	0.115	0.041	2	0.108	0.090	0.091	0.066	0.267
10	0.1900	5/16	0.362	0.333	0.081	0.060	0.142	0.118	0.202	0.132	0.041	2	0.125	0.107	0.102	0.075	0.313
12	0.2160	3/8	0.412	0.380	0.092	0.068	0.161	0.135	0.264	0.148	0.056	3	0.135	0.117	0.113	0.084	0.362
1/4	0.2500	7/16	0.477	0.442	0.107	0.079	0.186	0.158	0.284	0.168	0.057	3	0.155	0.137	0.129	0.095	0.424
5/16	0.3125	1/2	0.597	0.556	0.134	0.099	0.232	0.198	0.374	0.223	0.086	4	0.205	0.187	0.155	0.117	0.539
3/8	0.3750	9/16	0.717	0.670	0.161	0.117	0.278	0.239	0.394	0.243	0.086	4	0.225	0.207	0.182	0.139	0.653
7/16	0.4375	5/8	0.760	0.715	0.156	0.122	0.279	0.239	0.404	0.253	0.086	4	0.235	0.217	0.195	0.150	0.690
1/2	0.5000	3/4	0.815	0.765	0.156	0.131	0.288	0.244	0.416	0.265	0.086	4	0.247	0.229	0.212	0.163	0.739

GENERAL NOTE: For additional requirements, refer to para. 2.

NOTES:

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

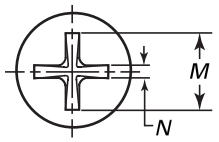
(2) Screws of these lengths and shorter are undercut. Screws of longer lengths shall have head heights as shown in Table 4C.

(3) Tabulated values determined from formula for maximum *H* in Appendix A.

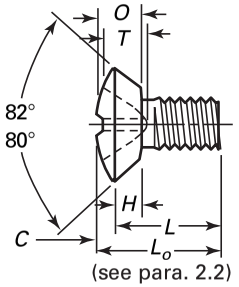
(4) No tolerance for gaging diameter is given. If the gaging diameter of the gage used differs from tabulated value, the protrusion will be affected accordingly and the proper protrusion values must be recalculated using the formulas shown in Appendix I.

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This type of recess consists of two intersecting slots with parallel sides converging to a slightly truncated apex at bottom of recess.



(see para. 2.2)

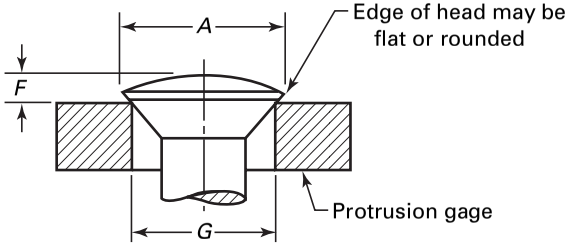


Table 6D Dimensions of Type II Cross Recessed Undercut Oval Countersunk Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]		Length, *L* [Note (2)]	Head Diameter, *A*		Head Side Height, *H*, Ref. [Note (3)]	Head Crown Height, *C*, Ref.	Total Head Height, *O*		Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size [Note (4)]	Recess Penetration Gaging Depth		Protrusion Above Gaging Diameter, *F* [Note (5)]		Gaging Diameter, *G* [Note (5)]
		[Note (2)]	Max.	Min.	[Note (3)]	*C*, Ref.	Max.	Min.	*M*, Ref.	*T*, Ref.	*N*, Ref.	[Note (4)]	Max.	Min.	Max.	Min.	[Note (5)]
0	0.0600	1/8	0.112	0.096	0.025	0.021	0.046	0.033	0.067	0.029	0.020	...	[Note (6)]	[Note (6)]	0.047	0.031	0.078
1	0.0730	1/8	0.137	0.120	0.031	0.025	0.056	0.042	0.082	0.039	0.022	...	[Note (6)]	[Note (6)]	0.053	0.035	0.101
2	0.0860	1/8	0.162	0.144	0.036	0.029	0.065	0.050	0.100	0.050	0.025	...	0.030	0.020	0.058	0.039	0.124
3	0.0990	1/8	0.187	0.167	0.042	0.033	0.075	0.059	0.111	0.058	0.026	...	0.038	0.027	0.064	0.044	0.148
4	0.1120	3/16	0.212	0.191	0.047	0.037	0.084	0.067	0.129	0.070	0.029	...	0.050	0.038	0.069	0.048	0.172
5	0.1250	3/16	0.237	0.215	0.053	0.041	0.094	0.076	0.147	0.080	0.032	...	0.062	0.050	0.075	0.053	0.196
6	0.1380	3/16	0.262	0.238	0.059	0.045	0.104	0.084	0.161	0.088	0.034	...	0.071	0.059	0.080	0.057	0.220
8	0.1640	1/4	0.312	0.285	0.070	0.052	0.123	0.101	0.197	0.112	0.039	...	0.095	0.082	0.091	0.066	0.267
10	0.1900	5/16	0.362	0.333	0.081	0.060	0.142	0.118	0.236	0.132	0.045	...	0.121	0.107	0.102	0.075	0.313
12	0.2160	3/8	0.412	0.380	0.092	0.068	0.161	0.135	0.260	0.148	0.048	...	0.137	0.122	0.113	0.084	0.362
1/4	0.2500	7/16	0.477	0.442	0.107	0.079	0.186	0.158	0.304	0.169	0.054	...	0.167	0.150	0.129	0.095	0.424
5/16	0.3125	1/2	0.597	0.556	0.134	0.099	0.232	0.198	0.381	0.218	0.066	...	0.218	0.198	0.155	0.117	0.539
3/8	0.3750	9/16	0.717	0.670	0.161	0.117	0.278	0.239	0.453	0.266	0.077	...	0.266	0.244	0.182	0.139	0.653
7/16	0.4375	5/8	0.760	0.715	0.156	0.122	0.279	0.239	0.498	0.295	0.083	...	0.296	0.273	0.195	0.150	0.690
1/2	0.5000	3/4	0.815	0.765	0.156	0.131	0.288	0.244	0.548	0.328	0.090	...	0.329	0.305	0.212	0.163	0.739

GENERAL NOTE: For additional requirements, refer to para. 2.

NOTES:

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

(2) Screws of these lengths and shorter are undercut. Screws of longer lengths shall have head heights as shown in Table 4D.

(3) Tabulated values determined from formula for maximum *H* in Appendix A.

(4) Point same on all drivers.

(5) No tolerance for gaging diameter is given. If the gaging diameter of the gage used differs from tabulated value, the protrusion will be affected accordingly and the proper protrusion values must be recalculated using the formulas shown in Appendix I.

(6) Not practical to gage.

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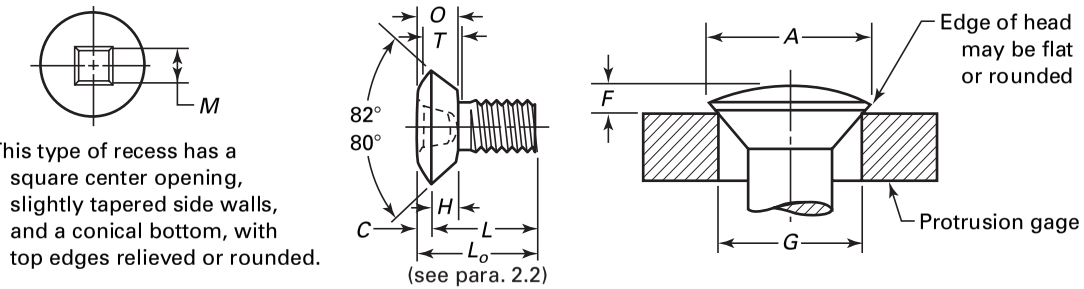


Table 6E Dimensions of Type III Square Recessed Undercut Oval Countersunk Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]		Length, *L* [Note (2)]	Head Diameter, *A*		Head Side Height, *H*, Ref. [Note (3)]	Head Crown Height, *C*, Ref.	Total Head Height, *O*		Recess Across Flats, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Size [Note (4)]	Recess Penetration Gaging Depth [Note (5)]		Protrusion Above Gaging Diameter, *F* [Note (6)]		Gaging Diameter, *G* [Note (6)]
			Max.	Min.			Max.	Min.				Max.	Min.	Max.	Min.	
3	0.0990	1/8	0.187	0.167	0.042	0.033	0.075	0.059	0.070	0.066	0	0.038	0.028	0.064	0.044	0.148
4	0.1120	3/16	0.212	0.191	0.047	0.037	0.084	0.067	0.070	0.066	0	0.038	0.028	0.069	0.048	0.172
5	0.1250	3/16	0.237	0.215	0.053	0.041	0.094	0.076	0.091	0.106	1R	0.065	0.050	0.075	0.053	0.196
6	0.1380	3/16	0.262	0.238	0.059	0.045	0.104	0.084	0.091	0.106	1R	0.065	0.050	0.080	0.057	0.220
8	0.1640	1/4	0.312	0.285	0.070	0.052	0.123	0.101	0.112	0.127	2R	0.075	0.060	0.091	0.066	0.267
10	0.1900	5/16	0.362	0.333	0.081	0.060	0.142	0.118	0.112	0.127	2R	0.075	0.060	0.102	0.075	0.313
12	0.2160	3/8	0.412	0.380	0.092	0.068	0.161	0.135	0.133	0.158	3R	0.095	0.080	0.113	0.084	0.362
1/4	0.2500	7/16	0.477	0.442	0.107	0.079	0.186	0.158	0.133	0.158	3R	0.095	0.080	0.129	0.095	0.424
5/16	0.3125	1/2	0.597	0.556	0.134	0.099	0.232	0.198	0.191	0.194	4R	0.100	0.085	0.155	0.117	0.539
3/8	0.3750	9/16	0.717	0.670	0.161	0.117	0.278	0.239	0.191	0.194	4R	0.100	0.085	0.182	0.139	0.653

GENERAL NOTE: For additional requirements, refer to para. 2.

NOTES:

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

(2) Screws of these lengths and shorter shall have undercut heads. Screws of longer lengths shall have head heights as shown in Table 4E.

(3) Tabulated values determined from formula for maximum *H* in Appendix A.

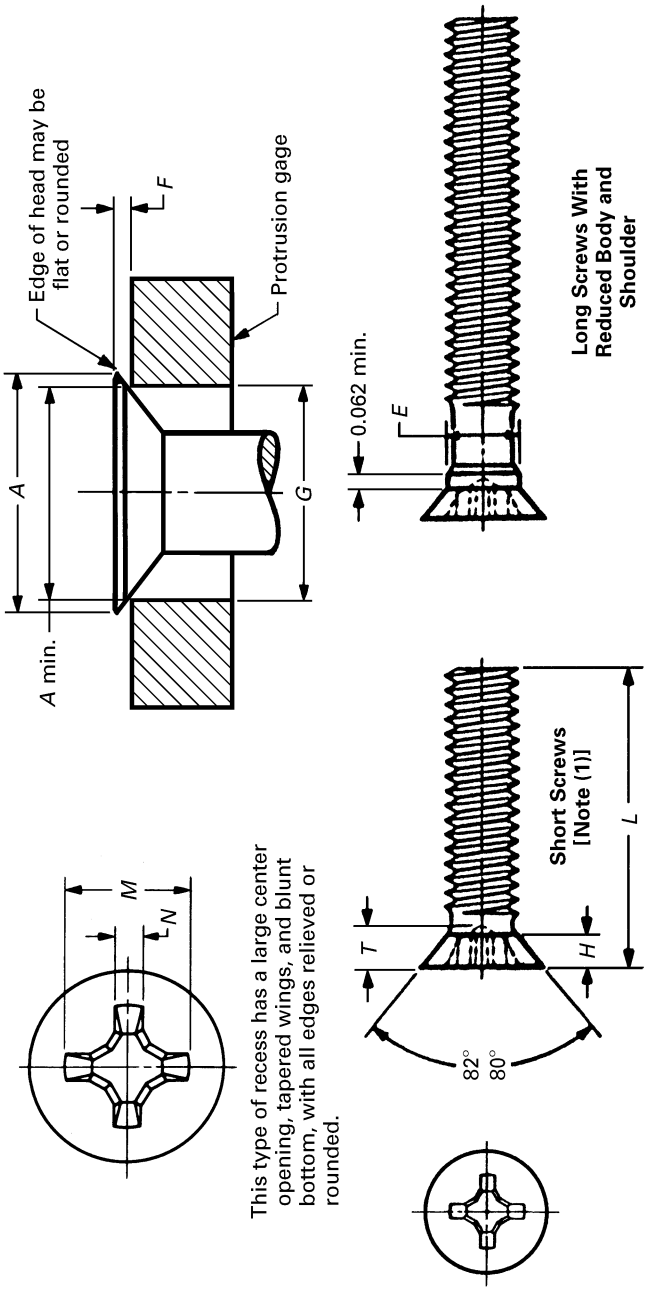
(4) "R" in the recess size tabulation means regular depth recess.

(5) Square recesses incorporate a slight taper on the sides of the recess. This taper can result in loss of penetration gaging depth on finished fasteners due to the build up of plating in the recesses. The recess penetration dimensions specified here are for finished (plated) product. Manufacturers should be advised that they should not use all this tolerance in the heading process, or an out of tolerance condition could exist after plating.

(6) No tolerance for gaging diameter is given. If the gaging diameter of the gage used differs from this tabulated value, the protrusion will be affected accordingly, and the proper protrusion values must be recalculated using the formulas shown in Appendix I.

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Table 7A Illustration



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Table 7A Dimensions of Type I Cross Recessed Flat Countersunk Trim Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (2)]		Head Size	Shoulder Diameter, *E*		Head Diameter, *A*		Head Height, *H*, Ref. [Note (3)]	Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size	Recess Penetration Gaging Depth		Protrusion Above Gaging Diameter, *F* [Note (4)]		Gaging Diameter, *G* [Note (4)]
			Max.	Min.	Max.	Min.						Max.	Min.	Max.	Min.	
4	0.1120	3	0.112	0.106	0.187	0.167	0.052	0.100	0.060	0.018	1	0.061	0.045	0.031	0.018	0.148
5	0.1250	4	0.125	0.119	0.212	0.191	0.060	0.122	0.081	0.018	1	0.082	0.066	0.032	0.019	0.172
6	0.1380	4	0.138	0.131	0.212	0.191	0.052	0.122	0.081	0.018	1	0.082	0.066	0.032	0.019	0.172
6	0.1380	5	0.138	0.131	0.237	0.215	0.068	0.148	0.074	0.027	2	0.075	0.052	0.034	0.020	0.196
8	0.1640	5	0.164	0.157	0.237	0.215	0.052	0.158	0.084	0.029	2	0.085	0.062	0.034	0.020	0.196
8	0.1640	6	0.164	0.157	0.262	0.238	0.069	0.176	0.102	0.030	2	0.103	0.080	0.036	0.021	0.220
10	0.1900	8	0.190	0.181	0.312	0.285	0.085	0.182	0.110	0.030	2	0.110	0.087	0.039	0.023	0.267
12	0.2160	8	0.216	0.207	0.312	0.285	0.069	0.192	0.120	0.032	2	0.120	0.097	0.039	0.023	0.267
12	0.2160	10	0.216	0.207	0.362	0.333	0.101	0.198	0.124	0.032	2	0.125	0.102	0.042	0.025	0.313
1/4	0.2500	10	0.250	0.240	0.362	0.333	0.080	0.198	0.124	0.032	2	0.125	0.102	0.042	0.025	0.313
1/4	0.2500	12	0.250	0.240	0.412	0.380	0.112	0.262	0.144	0.035	3	0.139	0.116	0.045	0.027	0.362
5/16	0.3125	12	0.312	0.302	0.412	0.380	0.075	0.262	0.144	0.035	3	0.139	0.116	0.045	0.027	0.362
5/16	0.3125	1/4	0.312	0.302	0.477	0.442	0.116	0.276	0.160	0.036	3	0.154	0.131	0.050	0.029	0.424
3/8	0.3750	5/16	0.375	0.364	0.597	0.556	0.155	0.358	0.205	0.061	4	0.196	0.174	0.057	0.034	0.539

GENERAL NOTES:

(a) For additional requirements, refer to para. 2.

(b) For reference, see Table 7A Illustration on previous page.

NOTES:

(1) Short screws include nominal lengths up to and including $1\frac{1}{8}$ in. for sizes No. 5 and smaller, and 2 in. for sizes No. 6 and larger.

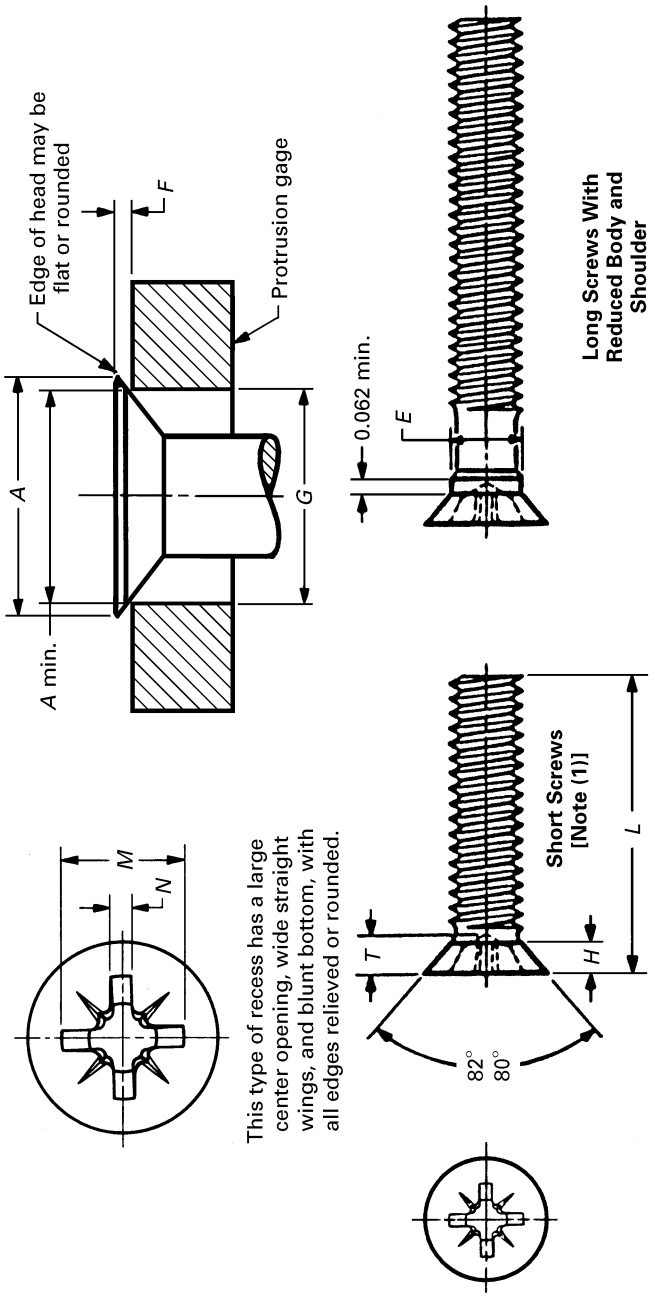
(2) Where specifying nominal size in decimals, zeros preceding the decimal and in the fourth decimal place shall be omitted.

(3) Tabulated values determined from formula for maximum *H* in Appendix A.

(4) No tolerance for gaging diameter is given. If the gaging diameter of the gage used differs from tabulated value, the protrusion will be affected accordingly and the proper protrusion values must be recalculated using the formulas shown in Appendix I.

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Table 7B Illustration



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Table 7B Dimensions of Type IA Cross Recessed Flat Countersunk Trim Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (2)]	Head Size	Shoulder Diameter, *E*		Head Diameter, *A*		Head Height, *H*, Ref. [Note (3)]	Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size	Recess Penetration Gaging Depth		Protrusion Above Gaging Diameter, *F* [Note (4)]		Gaging Diameter, *G* [Note (4)]
		Max.	Min.	Max.	Min.						Max.	Min.	Max.	Min.	
4 0.1120	3	0.112	0.106	0.187	0.167	0.052	0.100	0.060	0.029	1	0.058	0.042	0.031	0.018	0.148
5 0.1250	4	0.125	0.119	0.212	0.191	0.060	0.122	0.081	0.030	1	0.079	0.063	0.032	0.019	0.172
6 0.1380	4	0.138	0.131	0.212	0.191	0.052	0.122	0.081	0.030	1	0.079	0.063	0.032	0.019	0.172
6 0.1380	5	0.138	0.131	0.237	0.215	0.068	0.148	0.077	0.041	2	0.071	0.053	0.034	0.020	0.196
8 0.1640	5	0.164	0.157	0.237	0.215	0.052	0.158	0.088	0.041	2	0.081	0.063	0.034	0.020	0.196
8 0.1640	6	0.164	0.157	0.262	0.238	0.069	0.176	0.105	0.041	2	0.099	0.081	0.036	0.021	0.220
10 0.1900	8	0.190	0.181	0.312	0.285	0.085	0.182	0.112	0.041	2	0.107	0.089	0.039	0.023	0.267
12 0.2160	8	0.216	0.207	0.312	0.285	0.069	0.192	0.122	0.041	2	0.117	0.099	0.039	0.023	0.267
12 0.2160	10	0.216	0.207	0.362	0.333	0.101	0.198	0.127	0.041	2	0.122	0.104	0.042	0.025	0.313
1/4 0.2500	10	0.250	0.240	0.362	0.333	0.080	0.198	0.127	0.041	2	0.122	0.104	0.042	0.025	0.313
1/4 0.2500	12	0.250	0.240	0.412	0.380	0.112	0.262	0.149	0.056	3	0.136	0.118	0.045	0.027	0.362
5/16 0.3125	12	0.312	0.302	0.412	0.380	0.075	0.262	0.149	0.056	3	0.136	0.118	0.045	0.027	0.362
5/16 0.3125	1/4	0.312	0.302	0.477	0.442	0.116	0.276	0.164	0.057	3	0.151	0.133	0.050	0.029	0.424
3/8 0.3750	5/16	0.375	0.364	0.597	0.556	0.155	0.358	0.211	0.086	4	0.193	0.175	0.057	0.034	0.539

GENERAL NOTES:

(a) For additional requirements, refer to para. 2.

(b) For reference, see Table 7B Illustration on previous page.

NOTES:

(1) Short screws include nominal lengths up to and including $1\frac{1}{8}$ in. for sizes No. 5 and smaller, and 2 in. for sizes No. 6 and larger.

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

(3) Tabulated values determined from formula for maximum *H* in Appendix A.

(4) No tolerance for gaging diameter is given. If the gaging diameter of the gage used differs from tabulated value, the protrusion will be affected accordingly and the proper protrusion values must be recalculated using the formulas shown in Appendix I.

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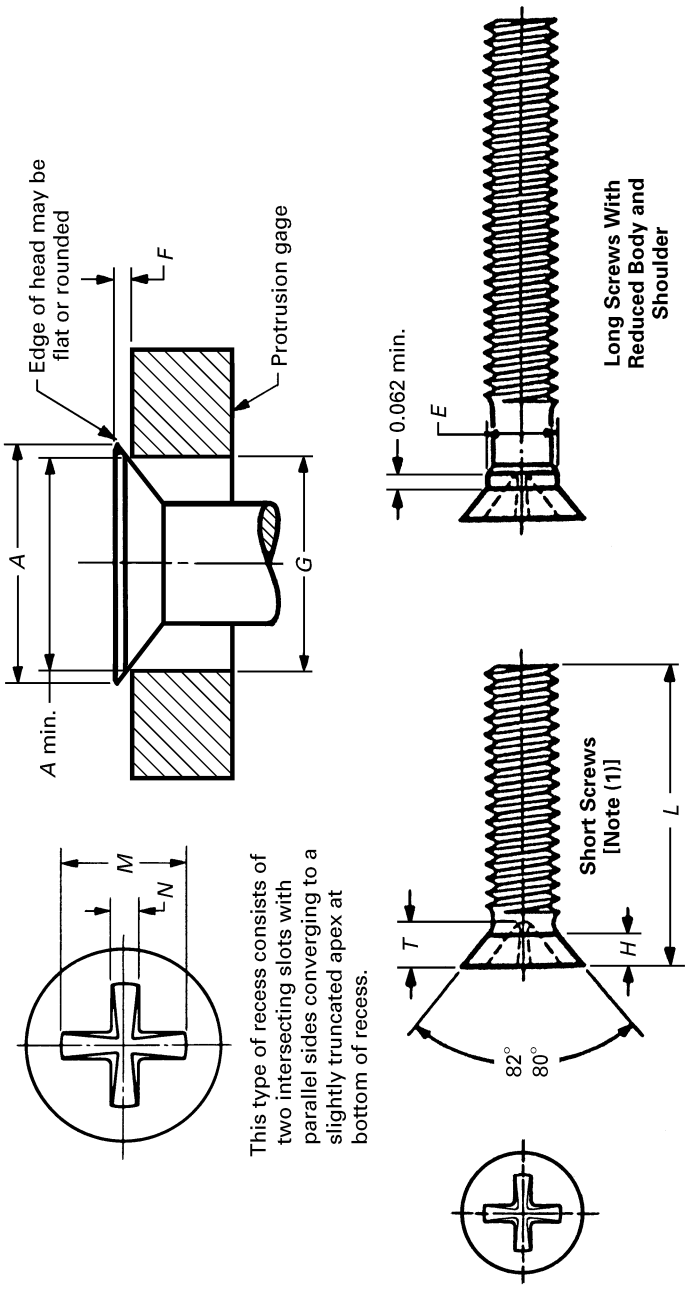


Table 7C Illustration

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Table 7C Dimensions of Type II Cross Recessed Flat Countersunk Trim Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (2)]	Head Size	Shoulder Diameter, *E*		Head Diameter, *A*		Head Height, *H*, Ref. [Note (3)]	Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size [Note (4)]	Recess Penetration Gaging Depth		Protrusion Above Gaging Diameter, *F* [Note (5)]		Gaging Diameter, *G* [Note (5)]
		Max.	Min.	Max.	Min.						Max.	Min.	Max.	Min.	
4 0.1120	3	0.112	0.106	0.187	0.167	0.052	0.133	0.072	0.030	...	0.053	0.041	0.031	0.018	0.148
5 0.1250	4	0.125	0.119	0.212	0.191	0.060	0.151	0.082	0.032	...	0.064	0.052	0.032	0.019	0.172
6 0.1380	4	0.138	0.131	0.212	0.191	0.052	0.151	0.082	0.032	...	0.064	0.052	0.032	0.019	0.172
6 0.1380	5	0.138	0.131	0.237	0.215	0.068	0.169	0.094	0.035	...	0.077	0.064	0.034	0.020	0.196
8 0.1640	5	0.164	0.157	0.237	0.215	0.052	0.169	0.094	0.035	...	0.077	0.064	0.034	0.020	0.196
8 0.1640	6	0.164	0.157	0.262	0.238	0.069	0.188	0.106	0.038	...	0.089	0.075	0.036	0.021	0.220
10 0.1900	8	0.190	0.181	0.312	0.285	0.085	0.224	0.124	0.043	...	0.113	0.099	0.039	0.023	0.267
12 0.2160	8	0.216	0.207	0.312	0.285	0.069	0.224	0.124	0.043	...	0.113	0.099	0.039	0.023	0.267
12 0.2160	10	0.216	0.207	0.362	0.333	0.101	0.260	0.148	0.048	...	0.137	0.122	0.042	0.025	0.313
1/4 0.2500	10	0.250	0.240	0.362	0.333	0.080	0.260	0.148	0.048	...	0.137	0.122	0.042	0.025	0.313
1/4 0.2500	12	0.250	0.240	0.412	0.380	0.112	0.297	0.172	0.054	...	0.162	0.145	0.045	0.027	0.362
5/16 0.3125	12	0.312	0.302	0.412	0.380	0.075	0.297	0.172	0.054	...	0.162	0.145	0.045	0.027	0.362
5/16 0.3125	1/4	0.312	0.302	0.477	0.442	0.116	0.344	0.195	0.061	...	0.193	0.176	0.050	0.029	0.424
3/8 0.3750	5/16	0.375	0.364	0.597	0.556	0.155	0.432	0.252	0.074	...	0.251	0.232	0.057	0.034	0.539

GENERAL NOTES:

(a) For additional requirements, refer to para. 2.

(b) For reference, see Table 7C Illustration on previous page.

NOTES:

(1) Short screws include nominal lengths up to and including $1\frac{1}{8}$ in. for sizes No. 5 and smaller, and 2 in. for sizes No. 6 and larger.

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

(3) Tabulated values determined from formula for maximum *H* in Appendix A.

(4) Point same on all drivers.

(5) No tolerance for gaging diameter is given. If the gaging diameter of the gage used differs from tabulated value, the protrusion will be affected accordingly and the proper protrusion values must be recalculated using the formulas shown in Appendix I.

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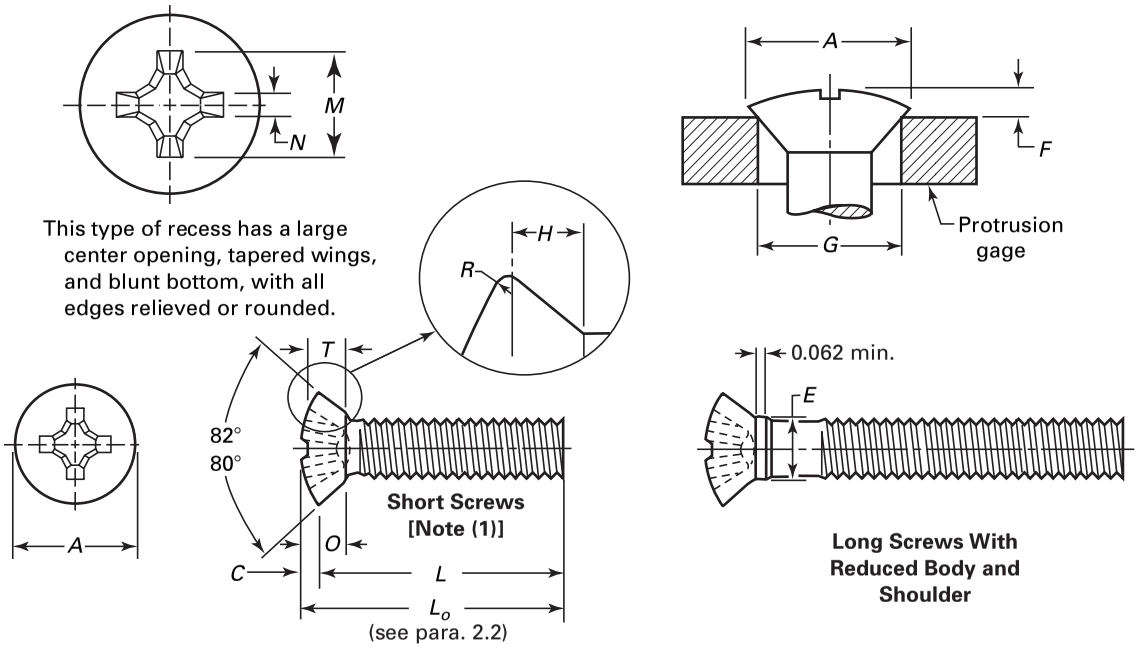


Table 8A Dimensions of Type I Cross Recessed Oval Countersunk Trim Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (2)]		Head Size	Shoulder Diameter, *E*		Head Diameter, *A*		Head Side Height, *H*, Ref. [Note (3)]	Head Crown Height, *C*, Ref.	Total Head Height, *O*, Ref. [Note (4)]	Head Radius, *R*, Ref.	Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size	Recess Penetration Gaging Depth		Protrusion Above Gaging Diameter, *F* [Note (5)]		Gaging Diameter, *G* [Note (5)]
			Max.	Min.	Max.	Min.									Max.	Min.	Max.	Min.	
For Short Screws [Note (1)]																			
4	0.1120	3	...	...	0.187	0.167	0.057	0.033	0.086	0.014	0.118	0.072	0.019	1	0.074	0.057	0.064	0.044	0.148
5	0.1250	4	...	...	0.212	0.191	0.066	0.037	0.099	0.017	0.130	0.086	0.019	1	0.087	0.070	0.069	0.048	0.172
6	0.1380	4	...	...	0.212	0.191	0.058	0.037	0.091	0.017	0.130	0.086	0.019	1	0.087	0.070	0.069	0.048	0.172
6	0.1380	5	...	...	0.237	0.215	0.075	0.041	0.112	0.019	0.152	0.073	0.028	2	0.074	0.050	0.075	0.053	0.196
8	0.1640	5	...	...	0.237	0.215	0.060	0.041	0.096	0.019	0.152	0.073	0.028	2	0.074	0.050	0.075	0.053	0.196
8	0.1640	6	...	...	0.262	0.238	0.076	0.045	0.117	0.021	0.172	0.092	0.030	2	0.094	0.069	0.080	0.057	0.220
10	0.1900	8	...	...	0.312	0.285	0.094	0.076	0.141	0.025	0.186	0.107	0.031	2	0.108	0.084	0.091	0.066	0.267
12	0.2160	8	...	...	0.312	0.285	0.078	0.076	0.125	0.025	0.186	0.107	0.031	2	0.108	0.084	0.091	0.066	0.267
12	0.2160	10	...	...	0.362	0.333	0.111	0.060	0.166	0.029	0.202	0.125	0.033	2	0.126	0.102	0.102	0.075	0.313

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Table 8A Dimensions of Type I Cross Recessed Oval Countersunk Trim Head Machine Screws (Cont'd)

Nominal Size or Basic Screw Diameter [Note (2)]		Head Size	Shoulder Diameter, *E*		Head Diameter, *A*		Head Side Height, *H*, Ref. [Note (3)]	Head Crown Height, *C*, Ref.	Total Head Height, *O*, Ref. [Note (4)]	Head Radius, *R*, Ref.	Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size	Recess Penetration Gaging Depth		Protrusion Above Gaging Diameter, *F* [Note (5)]		Gaging Diameter, *G* [Note (5)]
			Max.	Min.	Max.	Min.									Max.	Min.	Max.	Min.	
For Short Screws [Note (1)] (Cont'd)																			
1/4	0.2500	10	...	...	0.362	0.333	0.091	0.060	0.146	0.029	0.202	0.125	0.033	2	0.126	0.102	0.102	0.075	0.313
1/4	0.2500	12	...	...	0.412	0.380	0.124	0.068	0.187	0.033	0.264	0.140	0.038	3	0.135	0.111	0.113	0.084	0.362
5/16	0.3125	12	...	...	0.412	0.380	0.087	0.068	0.150	0.033	0.264	0.140	0.038	3	0.135	0.111	0.113	0.084	0.362
5/16	0.3125	1/4	...	...	0.477	0.442	0.130	0.079	0.202	0.038	0.284	0.160	0.040	3	0.156	0.131	0.129	0.095	0.424
3/8	0.3750	5/16	...	...	0.597	0.556	0.173	0.099	0.265	0.048	0.384	0.226	0.065	4	0.218	0.194	0.155	0.117	0.539
For Long Screws With Shoulder																			
4	0.1120	3	0.112	0.106	0.187	0.167	0.057	0.033	0.086	0.014	0.118	0.072	0.019	1	0.074	0.057	0.064	0.044	0.148
5	0.1250	4	0.125	0.119	0.212	0.191	0.066	0.037	0.099	0.017	0.130	0.086	0.019	1	0.087	0.070	0.069	0.048	0.172
6	0.1380	4	0.138	0.131	0.212	0.191	0.058	0.037	0.091	0.017	0.130	0.086	0.019	1	0.087	0.070	0.069	0.048	0.172
6	0.1380	5	0.138	0.131	0.237	0.215	0.075	0.041	0.112	0.019	0.162	0.084	0.028	2	0.085	0.061	0.075	0.053	0.196
8	0.1640	5	0.164	0.157	0.237	0.215	0.060	0.041	0.096	0.019	0.162	0.084	0.028	2	0.085	0.061	0.075	0.053	0.196
8	0.1640	6	0.164	0.157	0.262	0.238	0.076	0.045	0.117	0.021	0.188	0.108	0.031	2	0.110	0.085	0.080	0.057	0.220
10	0.1900	8	0.190	0.181	0.312	0.285	0.094	0.076	0.141	0.025	0.200	0.122	0.031	2	0.124	0.099	0.091	0.066	0.267
12	0.2160	8	0.216	0.207	0.312	0.285	0.078	0.076	0.125	0.025	0.200	0.122	0.031	2	0.124	0.099	0.091	0.066	0.267
12	0.2160	10	0.216	0.207	0.362	0.333	0.111	0.060	0.166	0.029	0.214	0.136	0.033	2	0.137	0.112	0.102	0.075	0.313
1/4	0.2500	10	0.250	0.240	0.362	0.333	0.091	0.060	0.146	0.029	0.214	0.136	0.033	2	0.137	0.112	0.102	0.075	0.313
1/4	0.2500	12	0.250	0.240	0.412	0.380	0.124	0.068	0.187	0.033	0.264	0.140	0.038	3	0.135	0.111	0.113	0.084	0.362
5/16	0.3125	12	0.312	0.302	0.412	0.380	0.087	0.068	0.150	0.033	0.264	0.140	0.038	3	0.135	0.111	0.113	0.084	0.362
5/16	0.3125	1/4	0.312	0.302	0.477	0.442	0.130	0.079	0.202	0.038	0.284	0.160	0.040	3	0.156	0.131	0.129	0.095	0.424
3/8	0.3750	5/16	0.375	0.364	0.597	0.556	0.173	0.099	0.265	0.048	0.384	0.226	0.065	4	0.218	0.194	0.155	0.117	0.539

GENERAL NOTE: For additional requirements, refer to para. 2.

NOTES:

(1) Short screws include nominal lengths up to and including 1 1/8 in. for sizes No. 5 and smaller, and 2 in. for sizes No. 6 and larger.

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

(3) Tabulated values determined from formula for maximum *H* in Appendix A.

(4) Tabulated values determined from formula for maximum *O* in Appendix A.

(5) No tolerance for gaging diameter is given. If the gaging diameter of the gage used differs from tabulated value, the protrusion will be affected accordingly and the proper protrusion values must be recalculated using the formulas shown in Appendix I.

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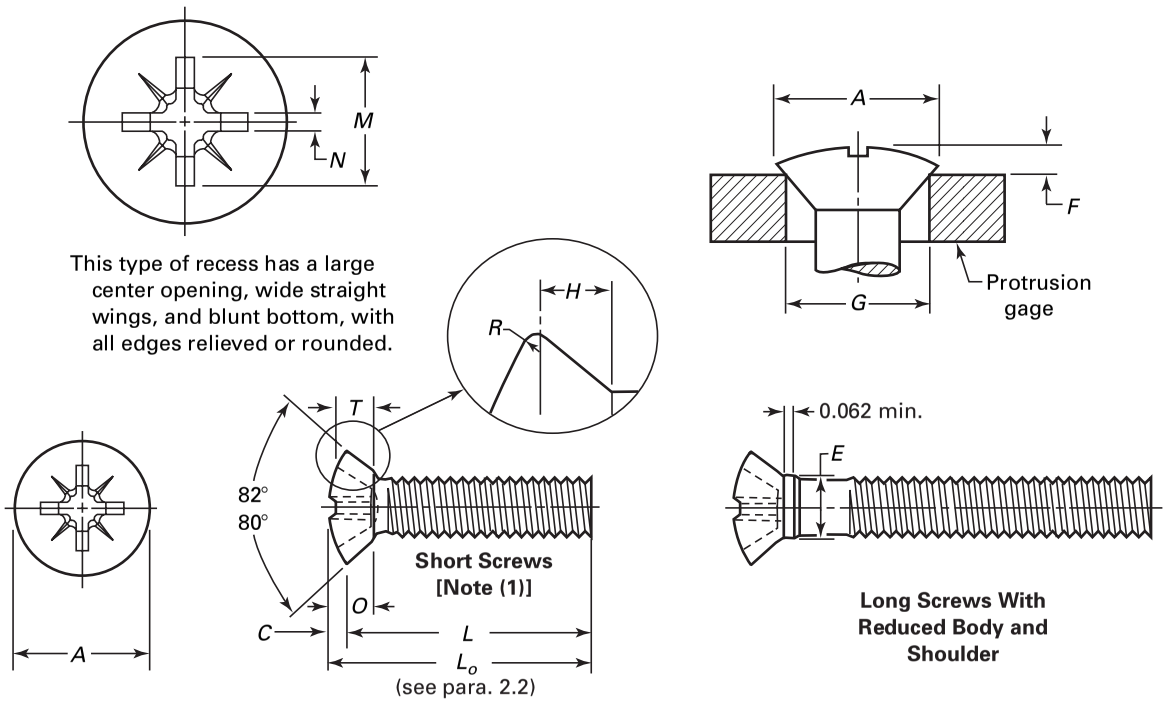


Table 8B Dimensions of Type IA Cross Recessed Oval Countersunk Trim Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (2)]		Head Size	Shoulder Diameter, *E*		Head Diameter, *A*		Head Side Height, *H*, Ref. [Note (3)]	Head Crown Height, *C*, Ref.	Total Head Height, *O*, Ref. [Note (4)]	Head Radius, *R*, Ref.	Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size	Recess Penetration Gaging Depth		Protrusion Above Gaging Diameter, *F* [Note (5)]		Gaging Diameter, *G* [Note (5)]
			Max.	Min.	Max.	Min.									Max.	Min.	Max.	Min.	
For Short Screws [Note (1)]																			
4	0.1120	3	...	...	0.187	0.167	0.057	0.033	0.086	0.014	0.118	0.077	0.030	1	0.074	0.058	0.064	0.044	0.148
5	0.1250	4	...	...	0.212	0.191	0.066	0.037	0.099	0.017	0.130	0.089	0.030	1	0.086	0.070	0.069	0.048	0.172
6	0.1380	4	...	...	0.212	0.191	0.058	0.037	0.091	0.017	0.130	0.089	0.030	1	0.086	0.070	0.069	0.048	0.172
6	0.1380	5	...	...	0.237	0.215	0.075	0.041	0.112	0.019	0.152	0.080	0.041	2	0.074	0.056	0.075	0.053	0.196
8	0.1640	5	...	...	0.237	0.215	0.060	0.041	0.096	0.019	0.152	0.080	0.041	2	0.074	0.056	0.075	0.053	0.196
8	0.1640	6	...	...	0.262	0.238	0.076	0.045	0.117	0.021	0.172	0.100	0.041	2	0.093	0.075	0.080	0.057	0.220
10	0.1900	8	...	...	0.312	0.285	0.094	0.076	0.141	0.025	0.186	0.115	0.041	2	0.108	0.090	0.091	0.066	0.267
12	0.2160	8	...	...	0.312	0.285	0.078	0.076	0.125	0.025	0.186	0.115	0.041	2	0.108	0.090	0.091	0.066	0.267
12	0.2160	10	...	...	0.362	0.333	0.111	0.060	0.166	0.029	0.202	0.132	0.041	2	0.125	0.107	0.102	0.075	0.313

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Table 8B Dimensions of Type IA Cross Recessed Oval Countersunk Trim Head Machine Screws (Cont'd)

Nominal Size or Basic Screw Diameter [Note (2)]		Head Size	Shoulder Diameter, *E*		Head Diameter, *A*		Head Side Height, *H*, Ref. [Note (3)]	Head Crown Height, *C*, Ref.	Total Head Height, *O*, Ref. [Note (4)]	Head Radius, *R*, Ref.	Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size	Recess Penetration Gaging Depth		Protrusion Above Gaging Diameter, *F* [Note (5)]		Gaging Diameter, *G* [Note (5)]
			Max.	Min.	Max.	Min.									Max.	Min.	Max.	Min.	
For Short Screws [Note (1)] (Cont'd)																			
1/4	0.2500	10	...	...	0.362	0.333	0.091	0.060	0.146	0.029	0.202	0.132	0.041	2	0.125	0.107	0.102	0.075	0.313
1/4	0.2500	12	...	...	0.412	0.380	0.124	0.068	0.187	0.033	0.264	0.148	0.056	3	0.135	0.117	0.113	0.084	0.362
5/16	0.3125	12	...	...	0.412	0.380	0.087	0.068	0.150	0.033	0.264	0.148	0.056	3	0.135	0.117	0.113	0.084	0.362
5/16	0.3125	1/4	...	...	0.477	0.442	0.130	0.079	0.202	0.038	0.284	0.168	0.057	3	0.155	0.137	0.129	0.095	0.424
3/8	0.3750	5/16	...	...	0.597	0.556	0.173	0.099	0.265	0.048	0.384	0.232	0.086	4	0.215	0.197	0.155	0.117	0.539
For Long Screws With Shoulder																			
4	0.1120	3	0.112	0.106	0.187	0.167	0.057	0.033	0.086	0.014	0.118	0.077	0.030	1	0.074	0.058	0.064	0.044	0.148
5	0.1250	4	0.125	0.119	0.212	0.191	0.066	0.037	0.099	0.017	0.130	0.089	0.030	1	0.086	0.070	0.069	0.048	0.172
6	0.1380	4	0.138	0.131	0.212	0.191	0.058	0.037	0.091	0.017	0.130	0.089	0.030	1	0.086	0.070	0.069	0.048	0.172
6	0.1380	5	0.138	0.131	0.237	0.215	0.075	0.041	0.112	0.019	0.162	0.091	0.041	2	0.084	0.066	0.075	0.053	0.196
8	0.1640	5	0.164	0.157	0.237	0.215	0.060	0.041	0.096	0.019	0.162	0.091	0.041	2	0.084	0.066	0.075	0.053	0.196
8	0.1640	6	0.164	0.157	0.262	0.238	0.076	0.045	0.117	0.021	0.188	0.117	0.041	2	0.109	0.091	0.080	0.057	0.220
10	0.1900	8	0.190	0.181	0.312	0.285	0.094	0.076	0.141	0.025	0.200	0.130	0.041	2	0.122	0.104	0.091	0.066	0.267
12	0.2160	8	0.216	0.207	0.312	0.285	0.078	0.076	0.125	0.025	0.200	0.130	0.041	2	0.122	0.104	0.091	0.066	0.267
12	0.2160	10	0.216	0.207	0.362	0.333	0.111	0.060	0.166	0.029	0.214	0.143	0.041	2	0.136	0.118	0.102	0.075	0.313
1/4	0.2500	10	0.250	0.240	0.362	0.333	0.091	0.060	0.146	0.029	0.214	0.143	0.041	2	0.136	0.118	0.102	0.075	0.313
1/4	0.2500	12	0.250	0.240	0.412	0.380	0.124	0.068	0.187	0.033	0.264	0.148	0.056	3	0.135	0.117	0.113	0.084	0.362
5/16	0.3125	12	0.312	0.302	0.412	0.380	0.087	0.068	0.150	0.033	0.264	0.148	0.056	3	0.135	0.117	0.113	0.084	0.362
5/16	0.3125	1/4	0.312	0.302	0.477	0.442	0.130	0.079	0.202	0.038	0.284	0.168	0.057	3	0.155	0.137	0.129	0.095	0.424
3/8	0.3750	5/16	0.375	0.364	0.597	0.556	0.173	0.099	0.265	0.048	0.384	0.232	0.086	4	0.215	0.197	0.155	0.117	0.539

GENERAL NOTE: For additional requirements, refer to para. 2.

NOTES:

(1) Short screws include nominal lengths up to and including $1\frac{1}{8}$ in. for sizes No. 5 and smaller, and 2 in. for sizes No. 6 and larger.

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

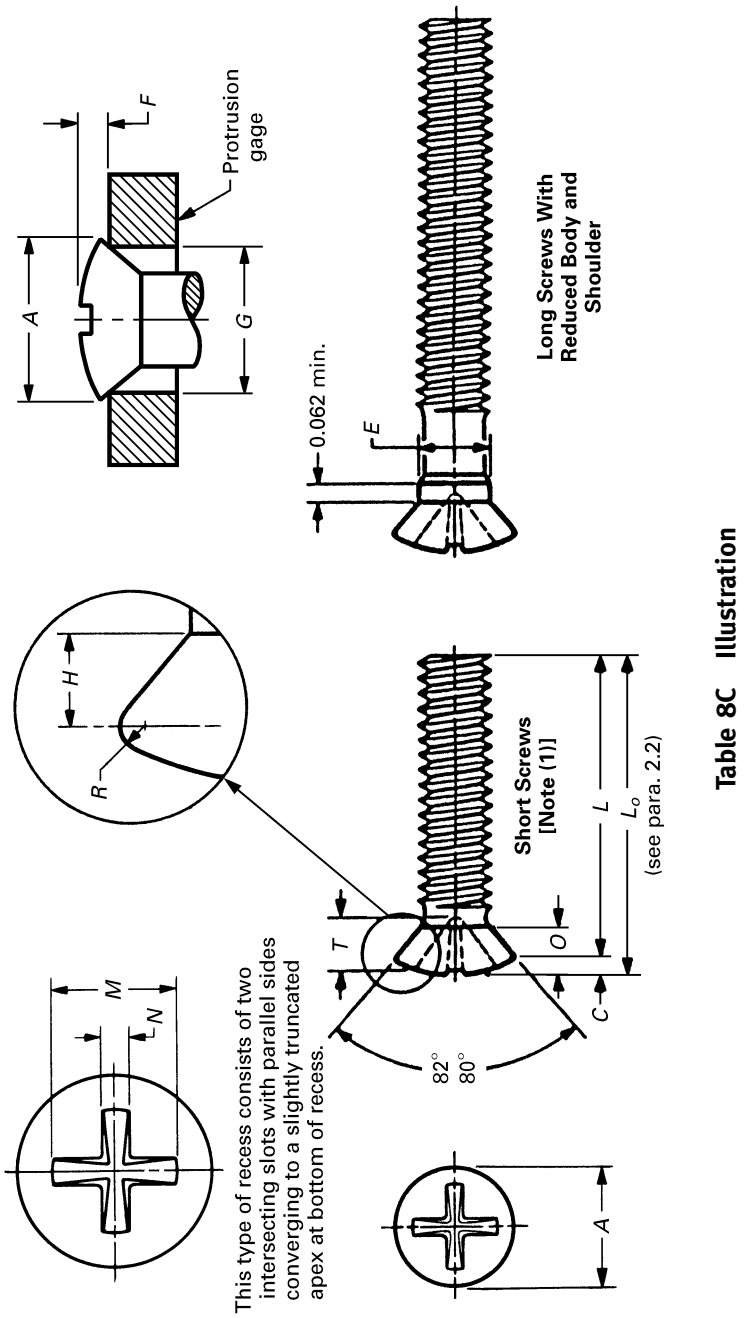
(3) Tabulated values determined from formula for maximum *H* in Appendix A.

(4) Tabulated values determined from formula for maximum *O* in Appendix A.

(5) No tolerance for gaging diameter is given. If the gaging diameter of the gage used differs from tabulated value, the protrusion will be affected accordingly and the proper protrusion values must be recalculated using the formulas shown in Appendix I.

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Table 8C Illustration



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Table 8C Dimensions of Type II Cross Recessed Oval Countersunk Trim Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (2)]		Head Size	Shoulder Diameter, *E*		Head Diameter, *A*		Head Side Height, *H*, Ref. [Note (3)]	Head Crown Height, *C*, Ref.	Total Head Height, *O*, Ref. [Note (4)]	Head Radius, *R*, Ref.	Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size [Note (5)]	Recess Penetration Gaging Depth		Protrusion Above Gaging Diameter, *F* [Note (6)]		Gaging Diameter, *G* [Note (6)]
			Max.	Min.	Max.	Min.									Max.	Min.	Max.	Min.	
4	0.1120	3	0.112	0.106	0.187	0.167	0.057	0.033	0.086	0.014	0.133	0.072	0.030	...	0.053	0.041	0.064	0.044	0.148
5	0.1250	4	0.125	0.119	0.212	0.191	0.066	0.037	0.099	0.017	0.151	0.082	0.032	...	0.064	0.052	0.069	0.048	0.172
6	0.1380	4	0.138	0.131	0.212	0.191	0.058	0.037	0.091	0.017	0.151	0.082	0.032	...	0.064	0.052	0.069	0.048	0.172
6	0.1380	5	0.138	0.131	0.237	0.215	0.075	0.041	0.112	0.019	0.169	0.094	0.035	...	0.077	0.064	0.075	0.053	0.196
8	0.1640	5	0.164	0.157	0.237	0.215	0.060	0.041	0.096	0.019	0.169	0.094	0.035	...	0.077	0.064	0.075	0.053	0.196
8	0.1640	6	0.164	0.157	0.262	0.238	0.076	0.045	0.117	0.021	0.188	0.106	0.038	...	0.089	0.075	0.080	0.057	0.220
10	0.1900	8	0.190	0.181	0.312	0.285	0.094	0.076	0.141	0.025	0.224	0.124	0.043	...	0.113	0.099	0.091	0.066	0.267
12	0.2160	8	0.216	0.207	0.312	0.285	0.078	0.076	0.125	0.025	0.224	0.124	0.043	...	0.113	0.099	0.091	0.066	0.267
12	0.2160	10	0.216	0.207	0.362	0.333	0.111	0.060	0.166	0.029	0.260	0.148	0.048	...	0.137	0.122	0.102	0.075	0.313
1/4	0.2500	10	0.250	0.240	0.362	0.333	0.091	0.060	0.146	0.029	0.260	0.148	0.048	...	0.137	0.122	0.102	0.075	0.313
1/4	0.2500	12	0.250	0.240	0.412	0.380	0.124	0.068	0.187	0.033	0.297	0.172	0.054	...	0.162	0.145	0.113	0.084	0.362
5/16	0.3125	12	0.312	0.302	0.412	0.380	0.087	0.068	0.150	0.033	0.297	0.172	0.054	...	0.162	0.145	0.113	0.084	0.362
5/16	0.3125	1/4	0.312	0.302	0.477	0.442	0.130	0.079	0.202	0.038	0.344	0.195	0.061	...	0.193	0.176	0.129	0.095	0.424
3/8	0.3750	5/16	0.375	0.364	0.597	0.556	0.173	0.099	0.265	0.048	0.432	0.252	0.074	...	0.251	0.232	0.155	0.117	0.539

GENERAL NOTES:

(a) For additional requirements, refer to para. 2.

(b) For reference, see Table 8C Illustration on previous page.

NOTES:

(1) Short screws include nominal lengths up to and including $1\frac{1}{8}$ in. for sizes No. 5 and smaller, and 2 in. for sizes No. 6 and larger.

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

(3) Tabulated values determined from formula for maximum *H* in Appendix A.

(4) Tabulated values determined from formula for maximum *O* in Appendix A.

(5) Point same on all drivers.

(6) No tolerance for gaging diameter is given. If the gaging diameter of the gage used differs from tabulated value, the protrusion will be affected accordingly and the proper protrusion values must be recalculated using the formulas shown in Appendix I.

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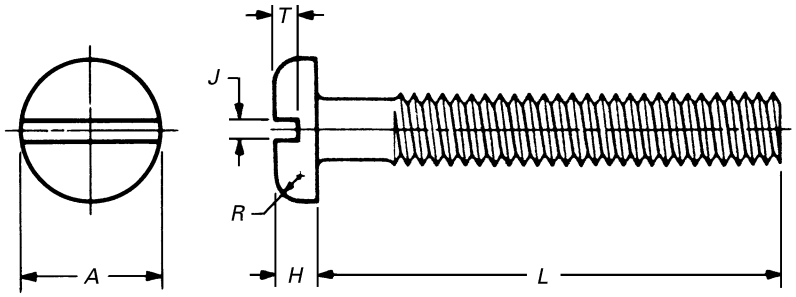


Table 9A Dimensions of Slotted Pan Head Machine Screws

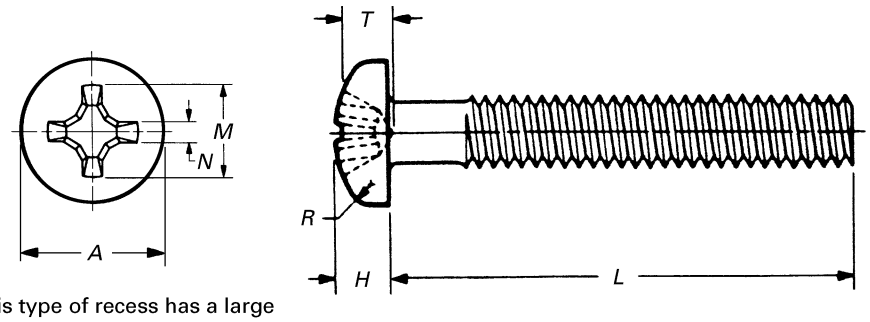
Nominal Size or Basic Screw Diameter [Note (1)]		Head Diameter, *A*		Head Height, *H*		Head Radius, *R*,	Slot Width, *J*		Slot Depth, *T*	
		Max.	Min.	Max.	Min.	Max.	Max.	Min.	Max.	Min.
0000	0.0210	0.042	0.036	0.016	0.010	0.007	0.008	0.004	0.008	0.004
000	0.0340	0.066	0.060	0.023	0.017	0.010	0.012	0.008	0.012	0.008
00	0.0470	0.090	0.082	0.032	0.025	0.015	0.017	0.010	0.016	0.010
0	0.0600	0.116	0.104	0.039	0.031	0.020	0.023	0.016	0.022	0.014
1	0.0730	0.142	0.130	0.046	0.038	0.025	0.026	0.019	0.027	0.018
2	0.0860	0.167	0.155	0.053	0.045	0.035	0.031	0.023	0.031	0.022
3	0.0990	0.193	0.180	0.060	0.051	0.037	0.035	0.027	0.036	0.026
4	0.1120	0.219	0.205	0.068	0.058	0.042	0.039	0.031	0.040	0.030
5	0.1250	0.245	0.231	0.075	0.065	0.044	0.043	0.035	0.045	0.034
6	0.1380	0.270	0.256	0.082	0.072	0.046	0.048	0.039	0.050	0.037
8	0.1640	0.322	0.306	0.096	0.085	0.052	0.054	0.045	0.058	0.045
10	0.1900	0.373	0.357	0.110	0.099	0.061	0.060	0.050	0.068	0.053
12	0.2160	0.425	0.407	0.125	0.112	0.078	0.067	0.056	0.077	0.061
1/4	0.2500	0.492	0.473	0.144	0.130	0.087	0.075	0.064	0.087	0.070
5/16	0.3125	0.615	0.594	0.178	0.162	0.099	0.084	0.072	0.106	0.085
3/8	0.3750	0.740	0.716	0.212	0.195	0.143	0.094	0.081	0.124	0.100
7/16	0.4375	0.863	0.837	0.247	0.228	0.153	0.094	0.081	0.142	0.116
1/2	0.5000	0.987	0.958	0.281	0.260	0.175	0.106	0.091	0.161	0.131
9/16	0.5625	1.041	1.000	0.315	0.293	0.197	0.118	0.102	0.179	0.146
5/8	0.6250	1.172	1.125	0.350	0.325	0.219	0.133	0.116	0.197	0.162
3/4	0.7500	1.435	1.375	0.419	0.390	0.263	0.149	0.131	0.234	0.192

GENERAL NOTE: For additional requirements, refer to para. 2.

NOTE:

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

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This type of recess has a large center opening, tapered wings, and blunt bottom, with all edges relieved or rounded.

Table 9B Dimensions of Type I Cross Recessed Pan Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]		Head Diameter, *A*		Head Height, *H*		Head Radius, *R*, Min.	Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size	Recess Penetration Gaging Depth	
		Max.	Min.	Max.	Min.						Max.	Min.
0	0.0600	0.116	0.104	0.044	0.036	0.005	0.060	0.030	0.013	0	0.032	0.014
1	0.0730	0.142	0.130	0.053	0.044	0.005	0.067	0.035	0.014	0	0.040	0.022
2	0.0860	0.167	0.155	0.062	0.053	0.010	0.097	0.050	0.017	1	0.052	0.034
3	0.0990	0.193	0.180	0.071	0.062	0.010	0.105	0.059	0.019	1	0.061	0.043
4	0.1120	0.219	0.205	0.080	0.070	0.010	0.115	0.069	0.019	1	0.071	0.053
5	0.1250	0.245	0.231	0.089	0.079	0.015	0.152	0.070	0.028	2	0.072	0.046
6	0.1380	0.270	0.256	0.097	0.087	0.015	0.159	0.078	0.028	2	0.080	0.055
8	0.1640	0.322	0.306	0.115	0.105	0.015	0.175	0.095	0.030	2	0.097	0.071
10	0.1900	0.373	0.357	0.133	0.122	0.020	0.192	0.112	0.031	2	0.113	0.089
12	0.2160	0.425	0.407	0.151	0.139	0.025	0.252	0.128	0.034	3	0.124	0.098
1/4	0.2500	0.492	0.473	0.175	0.162	0.035	0.274	0.148	0.036	3	0.144	0.118
5/16	0.3125	0.615	0.594	0.218	0.203	0.040	0.343	0.181	0.059	4	0.173	0.149
3/8	0.3750	0.740	0.716	0.261	0.244	0.040	0.382	0.221	0.065	4	0.213	0.190
7/16	0.4375	0.863	0.837	0.305	0.284	0.050	0.406	0.246	0.068	4	0.239	0.214
1/2	0.5000	0.987	0.958	0.348	0.325	0.055	0.428	0.267	0.071	4	0.260	0.235
9/16	0.5625	1.041	1.000	0.391	0.366	0.065	0.458	0.300	0.076	4	0.292	0.268
5/8	0.6250	1.172	1.125	0.434	0.406	0.075	0.575	0.328	0.081	5	0.310	0.281
3/4	0.7500	1.435	1.375	0.521	0.488	0.085	0.621	0.368	0.086	5	0.349	0.322

GENERAL NOTE: For additional requirements, refer to para. 2.

NOTE:

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

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This type of recess has a large center opening, tapered wings, and a blunt bottom, with top edges relieved or rounded. A slot runs parallel to one pair of recess wings.

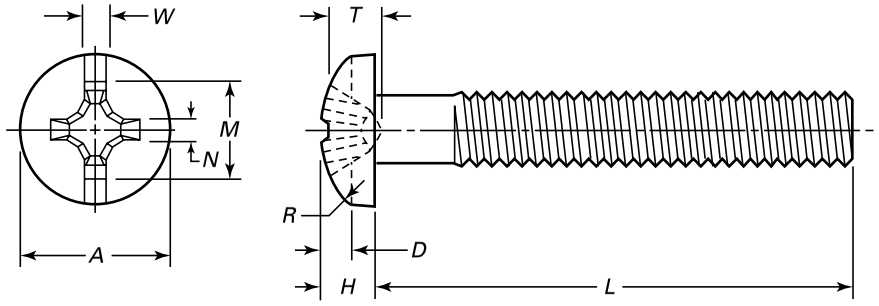


Table 9C Dimensions of Combination Slotted — Type I Cross Recessed Pan Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]		Head Diameter, *A*		Head Height, *H*		Head Radius, *R*, Min.	Slot Width, *W*		Slot Depth, *D* [Note (2)]		Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size	Recess Penetration Gaging Depth, *P*	
		Max.	Min.	Max.	Min.		Max.	Min.	Max.	Min.					Max.	Min.
0	0.0600	0.116	0.104	0.044	0.036	0.005	0.023	0.016	0.022	0.013	0.060	0.030	0.013	0	0.032	0.014
1	0.0730	0.142	0.130	0.053	0.044	0.005	0.026	0.019	0.027	0.016	0.067	0.035	0.014	0	0.040	0.022
2	0.0860	0.167	0.155	0.062	0.053	0.010	0.031	0.023	0.031	0.020	0.097	0.050	0.017	1	0.052	0.034
3	0.0990	0.193	0.180	0.071	0.062	0.010	0.035	0.027	0.036	0.023	0.105	0.059	0.019	1	0.061	0.043
4	0.1120	0.219	0.205	0.080	0.070	0.010	0.039	0.031	0.040	0.027	0.115	0.069	0.019	1	0.071	0.053
5	0.1250	0.245	0.231	0.089	0.079	0.015	0.043	0.035	0.045	0.030	0.152	0.070	0.028	2	0.072	0.046
6	0.1380	0.270	0.256	0.097	0.087	0.015	0.048	0.039	0.050	0.033	0.159	0.078	0.028	2	0.080	0.055
8	0.1640	0.322	0.306	0.115	0.105	0.015	0.054	0.045	0.058	0.041	0.175	0.095	0.030	2	0.097	0.071
10	0.1900	0.373	0.357	0.133	0.122	0.020	0.060	0.050	0.068	0.048	0.192	0.112	0.031	2	0.113	0.089
12	0.2160	0.425	0.407	0.151	0.139	0.025	0.067	0.056	0.077	0.055	0.252	0.128	0.034	3	0.124	0.098
1/4	0.2500	0.492	0.473	0.175	0.162	0.035	0.075	0.064	0.087	0.063	0.274	0.148	0.036	3	0.144	0.118
5/16	0.3125	0.615	0.594	0.218	0.203	0.040	0.084	0.072	0.106	0.076	0.343	0.181	0.059	4	0.173	0.149
3/8	0.3750	0.740	0.716	0.261	0.244	0.040	0.094	0.081	0.124	0.090	0.382	0.221	0.065	4	0.213	0.190
7/16	0.4375	0.863	0.838	0.304	0.286	0.050	0.094	0.081	0.142	0.105	0.406	0.246	0.068	4	0.239	0.214
1/2	0.5000	0.987	0.958	0.348	0.327	0.055	0.106	0.091	0.161	0.118	0.428	0.267	0.071	4	0.260	0.235

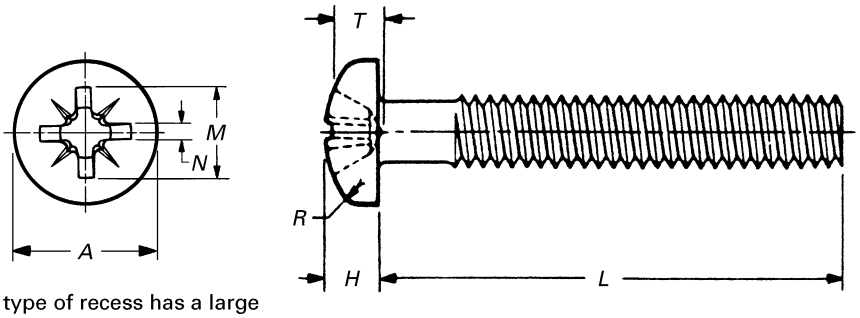
GENERAL NOTE: For additional requirements, refer to para. 2.

NOTES:

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

(2) Due to the underfill of material caused by the combination recess, the minimum slot depths are approximately 10% lower than slotted pan heads.

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This type of recess has a large center opening, wide straight wings, and blunt bottom, with all edges relieved or rounded.

Table 9D Dimensions of Type IA Cross Recessed Pan Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]		Head Diameter, *A*		Head Height, *H*		Head Radius, *R*, Min.	Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size	Recess Penetration Gaging Depth	
		Max.	Min.	Max.	Min.						Max.	Min.
0	0.0600	0.116	0.104	0.044	0.036	0.005	0.060	0.032	0.018	0	0.033	0.017
1	0.0730	0.142	0.130	0.053	0.044	0.005	0.067	0.039	0.018	0	0.040	0.024
2	0.0860	0.167	0.155	0.062	0.053	0.010	0.097	0.056	0.028	1	0.053	0.037
3	0.0990	0.193	0.180	0.071	0.062	0.010	0.105	0.065	0.029	1	0.062	0.046
4	0.1120	0.219	0.205	0.080	0.070	0.010	0.115	0.075	0.029	1	0.072	0.056
5	0.1250	0.245	0.231	0.089	0.079	0.015	0.147	0.075	0.040	2	0.068	0.050
6	0.1380	0.270	0.256	0.097	0.087	0.015	0.155	0.083	0.040	2	0.076	0.058
8	0.1640	0.322	0.306	0.115	0.105	0.015	0.170	0.099	0.041	2	0.092	0.074
10	0.1900	0.373	0.357	0.133	0.122	0.020	0.185	0.115	0.041	2	0.108	0.090
12	0.2160	0.425	0.407	0.151	0.139	0.025	0.247	0.130	0.056	3	0.117	0.099
1/4	0.2500	0.492	0.473	0.175	0.162	0.035	0.266	0.150	0.057	3	0.137	0.119
5/16	0.3125	0.615	0.594	0.218	0.203	0.040	0.334	0.182	0.086	4	0.164	0.146
3/8	0.3750	0.740	0.716	0.261	0.244	0.040	0.370	0.219	0.086	4	0.201	0.183
7/16	0.4375	0.863	0.837	0.305	0.284	0.050	0.392	0.242	0.086	4	0.224	0.206
1/2	0.5000	0.987	0.958	0.348	0.325	0.055	0.413	0.264	0.086	4	0.246	0.228
9/16	0.5625	1.041	1.000	0.391	0.366	0.065	0.444	0.295	0.087	4	0.277	0.259
5/8	0.6250	1.172	1.125	0.434	0.406	0.075	0.558	0.322	0.098	5	0.295	0.274
3/4	0.7500	1.435	1.375	0.521	0.488	0.085	0.602	0.368	0.098	5	0.341	0.320

GENERAL NOTE: For additional requirements, refer to para. 2.

NOTE:

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

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This type of recess has a large center opening, wide straight wings, and a blunt bottom, with top edges relieved or rounded. A slot runs parallel to one pair of recess wings.

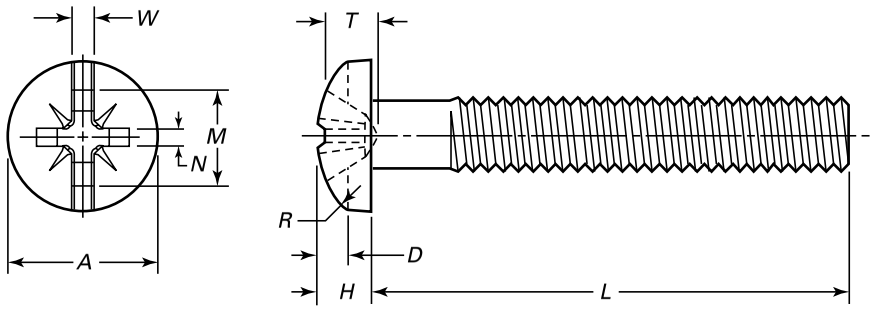


Table 9E Dimensions of Combination Slotted — Type IA Cross Recessed Pan Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]		Head Diameter, *A*		Head Height, *H*		Head Radius, *R*, Min.	Slot Width, *W*		Slot Depth, *D* [Note (2)]		Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size	Recess Penetration Gaging Depth, *P*	
		Max.	Min.	Max.	Min.		Max.	Min.	Max.	Min.					Max.	Min.
0	0.0600	0.116	0.104	0.044	0.036	0.005	0.023	0.016	0.022	0.013	0.060	0.032	0.018	0	0.033	0.017
1	0.0730	0.142	0.130	0.053	0.044	0.005	0.026	0.019	0.027	0.017	0.067	0.039	0.018	0	0.040	0.024
2	0.0860	0.167	0.155	0.062	0.053	0.010	0.031	0.023	0.031	0.020	0.097	0.056	0.028	1	0.053	0.037
3	0.0990	0.193	0.180	0.071	0.062	0.010	0.035	0.027	0.036	0.023	0.105	0.065	0.029	1	0.062	0.046
4	0.1120	0.219	0.205	0.080	0.070	0.010	0.039	0.031	0.040	0.027	0.115	0.075	0.029	1	0.072	0.056
5	0.1250	0.245	0.231	0.089	0.079	0.015	0.043	0.035	0.045	0.030	0.147	0.075	0.040	2	0.068	0.050
6	0.1380	0.270	0.256	0.097	0.087	0.015	0.048	0.039	0.050	0.033	0.155	0.083	0.040	2	0.076	0.058
8	0.1640	0.322	0.306	0.115	0.105	0.015	0.054	0.045	0.058	0.041	0.170	0.099	0.041	2	0.092	0.074
10	0.1900	0.373	0.357	0.133	0.122	0.020	0.060	0.050	0.068	0.048	0.185	0.115	0.041	2	0.108	0.090
12	0.2160	0.425	0.407	0.151	0.139	0.025	0.067	0.056	0.077	0.055	0.247	0.130	0.056	3	0.117	0.099
1/4	0.2500	0.492	0.473	0.175	0.162	0.035	0.075	0.064	0.087	0.063	0.266	0.150	0.057	3	0.137	0.119
5/16	0.3125	0.615	0.594	0.218	0.203	0.040	0.084	0.072	0.106	0.076	0.334	0.182	0.086	4	0.164	0.146
3/8	0.3750	0.740	0.716	0.261	0.244	0.040	0.094	0.081	0.124	0.090	0.370	0.219	0.086	4	0.201	0.183
7/16	0.4375	0.863	0.838	0.304	0.286	0.050	0.094	0.081	0.142	0.105	0.392	0.242	0.086	4	0.224	0.206
1/2	0.5000	0.987	0.958	0.348	0.327	0.055	0.106	0.091	0.161	0.118	0.413	0.264	0.086	4	0.246	0.228

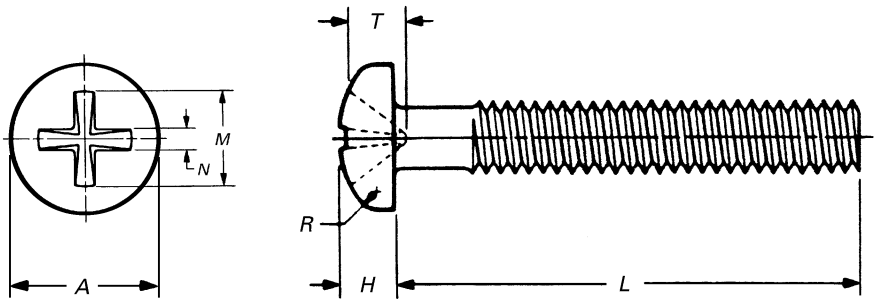
GENERAL NOTE: For additional requirements, refer to para. 2.

NOTES:

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

(2) Due to the underfill of material caused by the combination recess, the minimum slot depths are approximately 10% lower than slotted pan heads.

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This type of recess consists of two intersecting slots with parallel sides converging to a slightly truncated apex at bottom of recess.

Table 9F Dimensions of Type II Cross Recessed Pan Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]		Head Diameter, *A*		Head Height, *H*		Head Radius, *R*, Min.	Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size [Note (2)]	Recess Penetration Gaging Depth	
		Max.	Min.	Max.	Min.						Max.	Min.
0	0.0600	0.116	0.104	0.044	0.036	0.005	0.071	0.032	0.022	. . .	[Note (3)]	[Note (3)]
1	0.0730	0.142	0.130	0.053	0.044	0.005	0.084	0.040	0.024	. . .	[Note (3)]	[Note (3)]
2	0.0860	0.167	0.155	0.062	0.053	0.010	0.103	0.052	0.027	. . .	0.033	0.022
3	0.0990	0.193	0.180	0.071	0.062	0.010	0.119	0.062	0.029	. . .	0.043	0.032
4	0.1120	0.219	0.205	0.080	0.070	0.010	0.136	0.072	0.032	. . .	0.055	0.043
5	0.1250	0.245	0.231	0.089	0.079	0.015	0.152	0.083	0.034	. . .	0.066	0.052
6	0.1380	0.270	0.256	0.097	0.087	0.015	0.169	0.089	0.037	. . .	0.077	0.064
8	0.1640	0.322	0.306	0.115	0.105	0.015	0.199	0.108	0.041	. . .	0.097	0.083
10	0.1900	0.373	0.357	0.133	0.122	0.020	0.232	0.129	0.046	. . .	0.118	0.104
12	0.2160	0.425	0.407	0.151	0.139	0.025	0.263	0.150	0.051	. . .	0.139	0.124
1/4	0.2500	0.492	0.473	0.175	0.162	0.035	0.309	0.171	0.058	. . .	0.169	0.153
5/16	0.3125	0.615	0.594	0.218	0.203	0.040	0.385	0.221	0.069	. . .	0.220	0.202
3/8	0.3750	0.740	0.716	0.261	0.244	0.040	0.468	0.276	0.081	. . .	0.275	0.256
7/16	0.4375	0.863	0.837	0.305	0.284	0.050	0.544	0.325	0.093	. . .	0.325	0.304
1/2	0.5000	0.987	0.958	0.348	0.325	0.055	0.617	0.373	0.104	. . .	0.373	0.352
9/16	0.5625	1.041	1.000	0.391	0.366	0.065	0.625	0.378	0.105	. . .	0.378	0.357
5/8	0.6250	1.172	1.125	0.434	0.406	0.075	0.625	0.378	0.105	. . .	0.378	0.357
3/4	0.7500	1.435	1.375	0.521	0.488	0.085	0.625	0.378	0.105	. . .	0.378	0.357

GENERAL NOTE: For additional requirements, refer to para. 2.

NOTES:

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

(2) Point same on all drivers.

(3) Not practical to gage.

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This type of recess has a square center opening, slightly tapered side walls, and a conical bottom, with top edges relieved or rounded.

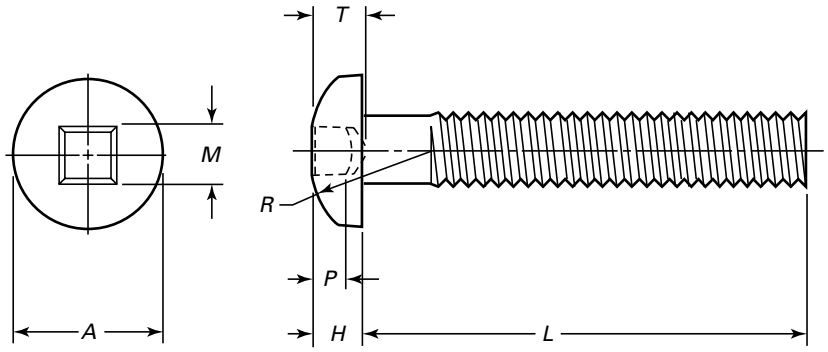


Table 9G Dimensions of Type III Square Recessed Pan Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]		Head Diameter, *A*		Head Height, *H*		Head Radius, *R*, Min.	Recess Across Flats, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Size [Note (2)]	Penetration Gaging Depth, *P* [Note (3)]	
		Max.	Min.	Max.	Min.					Max.	Min.
3	0.0990	0.193	0.180	0.078	0.069	0.010	0.070	0.066	0	0.038	0.028
4	0.1120	0.219	0.205	0.086	0.076	0.010	0.070	0.066	0	0.038	0.028
5	0.1250	0.245	0.231	0.095	0.085	0.015	0.091	0.106	1R	0.065	0.050
6	0.1380	0.270	0.256	0.103	0.093	0.015	0.091	0.106	1R	0.065	0.050
8	0.1640	0.322	0.306	0.120	0.110	0.015	0.112	0.127	2R	0.075	0.060
10	0.1900	0.373	0.357	0.137	0.126	0.020	0.112	0.127	2R	0.075	0.060
12	0.2160	0.425	0.407	0.153	0.141	0.025	0.133	0.158	3R	0.095	0.080
1/4	0.2500	0.492	0.473	0.175	0.162	0.035	0.133	0.158	3R	0.095	0.080
5/16	0.3125	0.615	0.594	0.218	0.203	0.040	0.191	0.194	4R	0.100	0.085
3/8	0.3750	0.740	0.716	0.261	0.244	0.040	0.191	0.194	4R	0.100	0.085

GENERAL NOTE: For additional requirements, refer to para. 2.

NOTES:

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

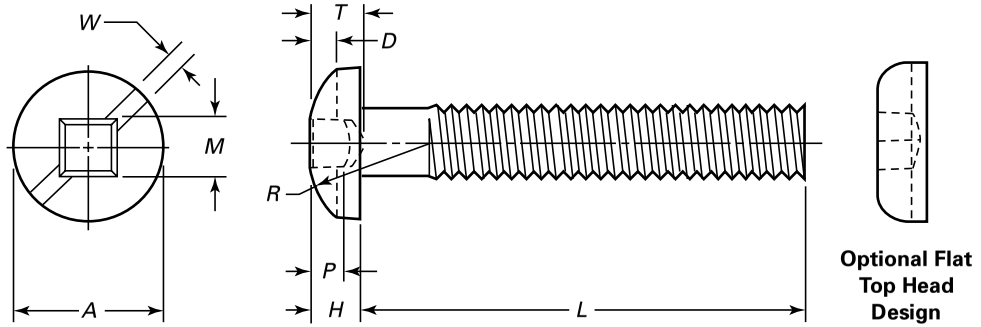
(2) "R" in the recess size tabulation means regular depth recess.

(3) Square recesses incorporate a slight taper on the sides of the recess. This taper can result in loss of penetration gaging depth on finished fasteners due to the build up of plating in the recesses. The recess penetration dimensions specified here are for finished (plated) product. Manufacturers should be advised that they should not use all this tolerance in the heading process, or an out of tolerance condition could exist after plating.

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This type of recess has a square center opening, slightly tapered side walls, a conical bottom, with top edges relieved or rounded. A slot runs through the recess. Slot may run either diagonal or across flats at the option of the manufacturer.



Optional Flat Top Head Design

Table 9H Dimensions of Combination Slotted — Type III Square Recessed Pan Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]		Head Diameter, *A*		Head Height, *H*		Head Radius, *R*, Min.	Slot Width, *W*		Slot Depth, *D* [Note (2)]		Recess Across Flats, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Size [Note (3)]	Penetration Gaging Depth, *P* [Note (4)]	
		Max.	Min.	Max.	Min.		Max.	Min.	Max.	Min.				Max.	Min.
3	0.0990	0.193	0.180	0.078	0.069	0.010	0.035	0.027	0.036	0.023	0.070	0.066	0	0.038	0.028
4	0.1120	0.219	0.205	0.086	0.076	0.010	0.039	0.031	0.040	0.027	0.070	0.066	0	0.038	0.028
5	0.1250	0.245	0.231	0.095	0.085	0.015	0.043	0.035	0.045	0.030	0.091	0.106	1R	0.065	0.050
6	0.1380	0.270	0.256	0.103	0.093	0.015	0.048	0.039	0.050	0.033	0.091	0.106	1R	0.065	0.050
8	0.1640	0.322	0.306	0.120	0.110	0.015	0.054	0.045	0.058	0.041	0.112	0.127	2R	0.075	0.060
10	0.1900	0.373	0.357	0.137	0.126	0.020	0.060	0.050	0.068	0.048	0.112	0.127	2R	0.075	0.060
12	0.2160	0.425	0.407	0.153	0.141	0.025	0.067	0.056	0.077	0.055	0.133	0.158	3R	0.095	0.080
1/4	0.2500	0.492	0.473	0.175	0.162	0.035	0.075	0.064	0.087	0.063	0.133	0.158	3R	0.095	0.080
5/16	0.3125	0.615	0.594	0.218	0.203	0.040	0.084	0.072	0.106	0.076	0.191	0.194	4R	0.100	0.085
3/8	0.3750	0.740	0.716	0.261	0.244	0.040	0.094	0.081	0.124	0.090	0.191	0.194	4R	0.100	0.085

GENERAL NOTE: For additional requirements, refer to para. 2.

NOTES:

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

(2) Due to the underfill of material caused by the combination recess, the minimum slot depths are approximately 10% lower than slotted pan heads.

(3) "R" in the recess size tabulation means regular depth recess.

(4) Square recesses incorporate a slight taper on the sides of the recess. This taper can result in loss of penetration gaging depth on finished fasteners due to the build up of plating in the recesses. The recess penetration dimensions specified here are for finished (plated) product. Manufacturers should be advised that they should not use all this tolerance in the heading process, or an out of tolerance condition could exist after plating.

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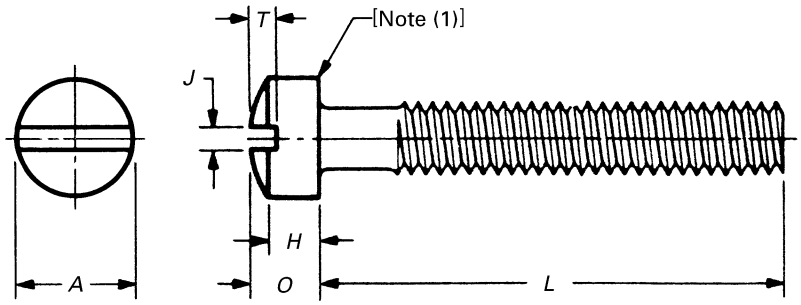


Table 10A Dimensions of Slotted Fillister Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (2)]		Head Diameter, *A*		Head Side Height, *H*		Total Head Height, *O*		Slot Width, *J*		Slot Depth, *T*	
		Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
0000	0.0210	0.038	0.032	0.019	0.011	0.025	0.015	0.008	0.004	0.012	0.006
000	0.0340	0.059	0.053	0.029	0.021	0.035	0.027	0.012	0.006	0.017	0.011
00	0.0470	0.082	0.072	0.037	0.028	0.047	0.039	0.017	0.010	0.022	0.015
0	0.0600	0.096	0.083	0.043	0.038	0.055	0.047	0.023	0.016	0.025	0.015
1	0.0730	0.118	0.104	0.053	0.045	0.066	0.058	0.026	0.019	0.031	0.020
2	0.0860	0.140	0.124	0.062	0.053	0.083	0.066	0.031	0.023	0.037	0.025
3	0.0990	0.161	0.145	0.070	0.061	0.095	0.077	0.035	0.027	0.043	0.030
4	0.1120	0.183	0.166	0.079	0.069	0.107	0.088	0.039	0.031	0.048	0.035
5	0.1250	0.205	0.187	0.088	0.078	0.120	0.100	0.043	0.035	0.054	0.040
6	0.1380	0.226	0.208	0.096	0.086	0.132	0.111	0.048	0.039	0.060	0.045
8	0.1640	0.270	0.250	0.113	0.102	0.156	0.133	0.054	0.045	0.071	0.054
10	0.1900	0.313	0.292	0.130	0.118	0.180	0.156	0.060	0.050	0.083	0.064
12	0.2160	0.357	0.334	0.148	0.134	0.205	0.178	0.067	0.056	0.094	0.074
1/4	0.2500	0.414	0.389	0.170	0.155	0.237	0.207	0.075	0.064	0.109	0.087
5/16	0.3125	0.518	0.490	0.211	0.194	0.295	0.262	0.084	0.072	0.137	0.110
3/8	0.3750	0.622	0.590	0.253	0.233	0.355	0.315	0.094	0.081	0.164	0.133
7/16	0.4375	0.625	0.589	0.265	0.242	0.368	0.321	0.094	0.081	0.170	0.135
1/2	0.5000	0.750	0.710	0.297	0.273	0.412	0.362	0.106	0.091	0.190	0.151
9/16	0.5625	0.812	0.768	0.336	0.308	0.466	0.410	0.118	0.102	0.214	0.172
5/8	0.6250	0.875	0.827	0.375	0.345	0.521	0.461	0.133	0.116	0.240	0.193
3/4	0.7500	1.000	0.945	0.441	0.406	0.612	0.542	0.149	0.131	0.281	0.226

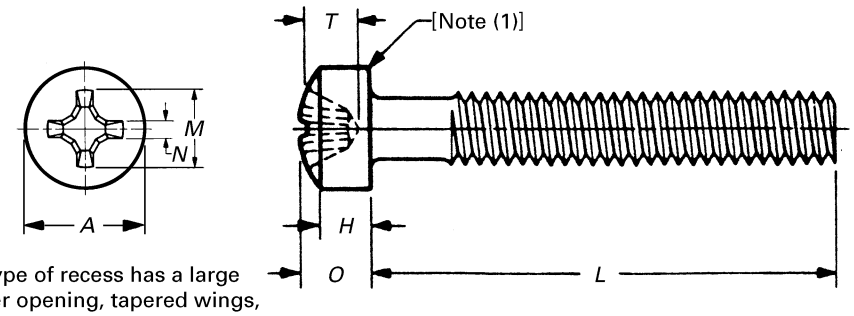
GENERAL NOTE: For additional requirements, refer to para. 2.

NOTES:

(1) A slight rounding of the edges at periphery of head shall be permissible provided the diameter of the bearing circle is equal to no less than 90% of the specified minimum head diameter.

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

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This type of recess has a large center opening, tapered wings, and blunt bottom, with all edges relieved or rounded.

Table 10B Dimensions of Type I Cross Recessed Fillister Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (2)]		Head Diameter, *A*		Head Side Height, *H*		Total Head Height, *O*		Recess Diameter, *M*, Ref,	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size	Recess Penetration Gaging Depth	
		Max.	Min.	Max.	Min.	Max.	Min.					Max.	Min.
0	0.0600	0.096	0.083	0.043	0.038	0.055	0.047	0.060	0.030	0.013	0	0.032	0.014
1	0.0730	0.118	0.104	0.053	0.045	0.066	0.058	0.067	0.035	0.014	0	0.040	0.022
2	0.0860	0.140	0.124	0.062	0.053	0.083	0.066	0.097	0.050	0.017	1	0.052	0.034
3	0.0990	0.161	0.145	0.070	0.061	0.095	0.077	0.105	0.059	0.019	1	0.061	0.043
4	0.1120	0.183	0.166	0.079	0.069	0.107	0.088	0.115	0.069	0.019	1	0.071	0.053
5	0.1250	0.205	0.187	0.088	0.078	0.120	0.100	0.136	0.054	0.027	2	0.056	0.031
6	0.1380	0.226	0.208	0.096	0.086	0.132	0.111	0.159	0.078	0.028	2	0.080	0.055
8	0.1640	0.270	0.250	0.113	0.102	0.156	0.133	0.175	0.095	0.030	2	0.097	0.071
10	0.1900	0.313	0.292	0.130	0.118	0.180	0.156	0.192	0.112	0.031	2	0.113	0.089
12	0.2160	0.357	0.334	0.148	0.134	0.205	0.178	0.252	0.128	0.034	3	0.124	0.098
1/4	0.2500	0.414	0.389	0.170	0.155	0.237	0.207	0.274	0.148	0.036	3	0.144	0.118
5/16	0.3125	0.518	0.490	0.211	0.194	0.295	0.262	0.315	0.190	0.042	3	0.186	0.160
3/8	0.3750	0.622	0.590	0.253	0.233	0.355	0.315	0.382	0.221	0.065	4	0.213	0.190
7/16	0.4375	0.625	0.589	0.265	0.242	0.368	0.321	0.406	0.246	0.068	4	0.239	0.214
1/2	0.5000	0.750	0.710	0.297	0.273	0.412	0.362	0.428	0.267	0.071	4	0.260	0.235
9/16	0.5625	0.812	0.768	0.336	0.308	0.466	0.410	0.456	0.300	0.076	4	0.292	0.268
5/8	0.6250	0.875	0.827	0.375	0.345	0.521	0.461	0.575	0.328	0.081	5	0.310	0.281
3/4	0.7500	1.000	0.945	0.441	0.406	0.612	0.542	0.621	0.368	0.086	5	0.349	0.322

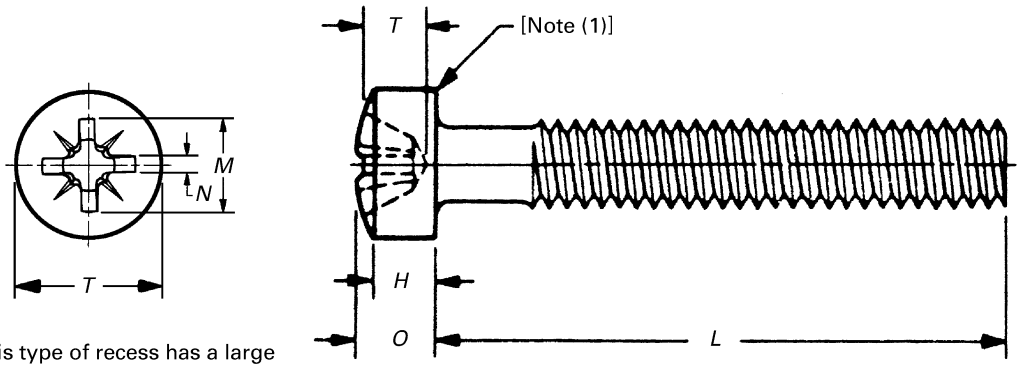
GENERAL NOTE: For additional requirements, refer to para. 2.

NOTES:

(1) A slight rounding of the edges at periphery of head shall be permissible provided the diameter of the bearing circle is equal to no less than 90% of the specified minimum head diameter.

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

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This type of recess has a large center opening, wide straight wings, and blunt bottom, with all edges relieved or rounded.

Table 10C Dimensions of Type IA Cross Recessed Fillister Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (2)]		Head Diameter, *A*		Head Side Height, *H*		Total Head Height, *O*		Recess Diameter, *M*, Ref,	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size	Recess Penetration Gaging Depth	
		Max.	Min.	Max.	Min.	Max.	Min.					Max.	Min.
0	0.0600	0.096	0.083	0.043	0.038	0.055	0.047	0.060	0.032	0.018	0	0.033	0.017
1	0.0730	0.118	0.104	0.053	0.045	0.066	0.058	0.067	0.039	0.018	0	0.040	0.024
2	0.0860	0.140	0.124	0.062	0.053	0.083	0.066	0.097	0.056	0.028	1	0.053	0.037
3	0.0990	0.161	0.145	0.070	0.061	0.095	0.077	0.105	0.065	0.029	1	0.062	0.046
4	0.1120	0.183	0.166	0.079	0.069	0.107	0.088	0.115	0.075	0.029	1	0.072	0.056
5	0.1250	0.205	0.187	0.088	0.078	0.120	0.100	0.133	0.061	0.040	2	0.054	0.036
6	0.1380	0.226	0.208	0.096	0.086	0.132	0.111	0.155	0.083	0.040	2	0.076	0.058
8	0.1640	0.270	0.250	0.113	0.102	0.156	0.133	0.170	0.099	0.041	2	0.092	0.074
10	0.1900	0.313	0.292	0.130	0.118	0.180	0.156	0.186	0.115	0.041	2	0.108	0.090
12	0.2160	0.357	0.334	0.148	0.134	0.205	0.178	0.247	0.130	0.056	3	0.117	0.099
1/4	0.2500	0.414	0.389	0.170	0.155	0.237	0.207	0.266	0.150	0.057	3	0.137	0.119
5/16	0.3125	0.518	0.490	0.211	0.194	0.295	0.262	0.308	0.193	0.057	3	0.181	0.163
3/8	0.3750	0.622	0.590	0.253	0.233	0.355	0.315	0.370	0.219	0.086	4	0.201	0.183
7/16	0.4375	0.625	0.589	0.265	0.242	0.368	0.321	0.392	0.242	0.086	4	0.224	0.206
1/2	0.5000	0.750	0.710	0.297	0.273	0.412	0.362	0.413	0.264	0.086	4	0.246	0.228
9/16	0.5625	0.812	0.768	0.336	0.308	0.466	0.410	0.444	0.295	0.087	4	0.277	0.259
5/8	0.6250	0.875	0.827	0.375	0.345	0.521	0.461	0.558	0.322	0.098	5	0.295	0.274
3/4	0.7500	1.000	0.945	0.441	0.406	0.612	0.542	0.602	0.368	0.098	5	0.341	0.320

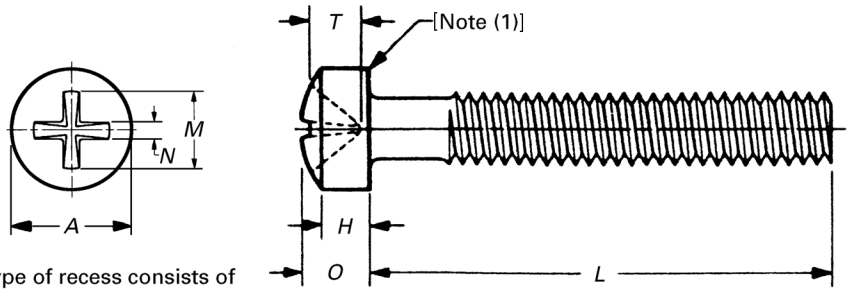
GENERAL NOTE: For additional requirements, refer to para. 2.

NOTES:

(1) A slight rounding of the edges at periphery of head shall be permissible provided the diameter of the bearing circle is equal to no less than 90% of the specified minimum head diameter.

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

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This type of recess consists of two intersecting slots with parallel sides converging to a slightly truncated apex at bottom of recess.

Table 10D Dimensions of Type II Cross Recessed Fillister Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (2)]		Head Diameter, *A*		Head Side Height, *H*		Total Head Height, *O*		Recess Diameter, *M*, Ref,	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size [Note (3)]	Recess Penetration Gaging Depth	
		Max.	Min.	Max.	Min.	Max.	Min.					Max.	Min.
0	0.0600	0.096	0.083	0.043	0.038	0.055	0.047	0.067	0.067	0.020	...	[Note (4)]	[Note (4)]
1	0.0730	0.118	0.104	0.053	0.045	0.066	0.058	0.083	0.083	0.022	...	[Note (4)]	[Note (4)]
2	0.0860	0.140	0.124	0.062	0.053	0.083	0.066	0.099	0.099	0.024	...	0.030	0.019
3	0.0990	0.161	0.145	0.070	0.061	0.095	0.077	0.115	0.115	0.027	...	0.041	0.029
4	0.1120	0.183	0.166	0.079	0.069	0.107	0.088	0.130	0.130	0.029	...	0.051	0.039
5	0.1250	0.205	0.187	0.088	0.078	0.120	0.100	0.147	0.147	0.031	...	0.062	0.049
6	0.1380	0.226	0.208	0.096	0.086	0.132	0.111	0.163	0.163	0.034	...	0.073	0.060
8	0.1640	0.270	0.250	0.113	0.102	0.156	0.133	0.194	0.195	0.039	...	0.094	0.080
10	0.1900	0.313	0.292	0.130	0.118	0.180	0.156	0.227	0.227	0.043	...	0.115	0.101
12	0.2160	0.357	0.334	0.148	0.134	0.205	0.178	0.259	0.259	0.048	...	0.137	0.121
1/4	0.2500	0.414	0.389	0.170	0.155	0.237	0.207	0.299	0.299	0.054	...	0.163	0.147
5/16	0.3125	0.518	0.490	0.211	0.194	0.295	0.262	0.377	0.377	0.066	...	0.215	0.197
3/8	0.3750	0.622	0.590	0.253	0.233	0.355	0.315	0.454	0.454	0.077	...	0.266	0.246
7/16	0.4375	0.625	0.589	0.265	0.242	0.368	0.321	0.454	0.454	0.077	...	0.266	0.246
1/2	0.5000	0.750	0.710	0.297	0.273	0.412	0.362	0.547	0.547	0.091	...	0.328	0.305
9/16	0.5625	0.812	0.768	0.336	0.308	0.466	0.410	0.592	0.592	0.097	...	0.359	0.333
5/8	0.6250	0.875	0.827	0.375	0.345	0.521	0.461	0.592	0.592	0.097	...	0.359	0.333
3/4	0.7500	1.000	0.945	0.441	0.406	0.612	0.542	0.592	0.592	0.097	...	0.359	0.333

GENERAL NOTE: For additional requirements, refer to para. 2.

NOTES:

(1) A slight rounding of the edges at periphery of head shall be permissible provided the diameter of the bearing circle is equal to no less than 90% of the specified minimum head diameter.

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

(3) Point same on all drivers.

(4) Not practical to gage.

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This type of recess has a square center opening, slightly tapered side walls, and a conical bottom, with top edges relieved or rounded.

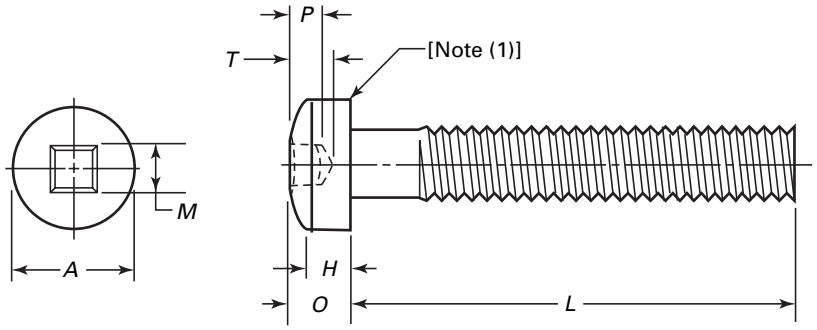


Table 10E Dimensions of Type III Square Recessed Fillister Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (2)]		Head Diameter, *A*		Head Side Height, *H*		Total Head Height, *O*		Recess Across Flats, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Size [Note (3)]	Recess Penetration Gaging Depth, *P* [Note (4)]	
		Max.	Min.	Max.	Min.	Max.	Min.				Max.	Min.
3	0.0990	0.161	0.145	0.070	0.061	0.095	0.077	0.070	0.066	0	0.038	0.028
4	0.1120	0.183	0.166	0.079	0.069	0.107	0.088	0.070	0.066	0	0.038	0.028
5	0.1250	0.205	0.187	0.088	0.078	0.120	0.100	0.091	0.106	1R	0.065	0.050
6	0.1380	0.226	0.208	0.096	0.086	0.132	0.111	0.091	0.106	1R	0.065	0.050
8	0.1640	0.270	0.250	0.113	0.102	0.156	0.133	0.112	0.127	2R	0.075	0.060
10	0.1900	0.313	0.292	0.130	0.118	0.180	0.156	0.112	0.127	2R	0.075	0.060
12	0.2160	0.357	0.334	0.148	0.134	0.205	0.178	0.133	0.158	3R	0.095	0.080
1/4	0.2500	0.414	0.389	0.170	0.155	0.237	0.207	0.133	0.158	3R	0.095	0.080
5/16	0.3125	0.518	0.490	0.211	0.194	0.295	0.262	0.191	0.194	4R	0.100	0.085
3/8	0.3750	0.622	0.590	0.253	0.233	0.355	0.315	0.191	0.194	4R	0.100	0.085

GENERAL NOTE: For additional requirements, refer to para. 2.

NOTES:

(1) A slight rounding of the edges at periphery of head shall be permissible provided the diameter of the bearing circle is equal to no less than 90% of the specified minimum head diameter.

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

(3) "R" in the recess size tabulation means regular depth recess.

(4) Square recesses incorporate a slight taper on the sides of the recess. This taper can result in loss of penetration gaging depth on finished fasteners due to the build up of plating in the recesses. The recess penetration dimensions specified here are for finished (plated) product. Manufacturers should be advised that they should not use all this tolerance in the heading process, or an out of tolerance condition could exist after plating.

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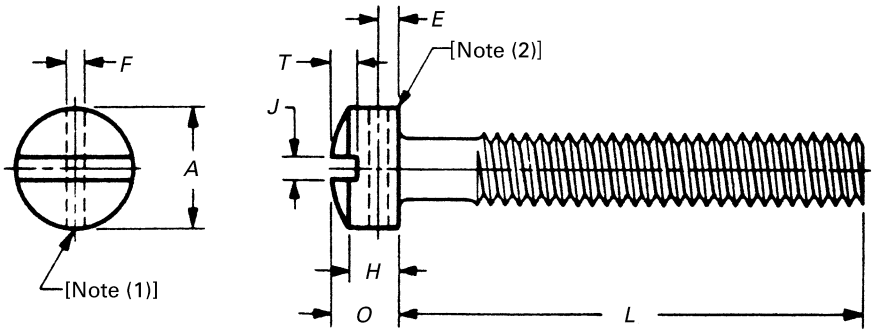


Table 11 Dimensions of Slotted Drilled Fillister Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (3)]		Head Diameter, *A*		Head Side Height, *H*		Total Head Height, *O*		Slot Width, *J*		Slot Depth, *T*		Drilled Hole Location, *E*, Basic [Note (1)]	Drilled Hole Diameter, *F*, Basic [Note (1)]
		Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.		
2	0.0860	0.140	0.124	0.062	0.055	0.083	0.070	0.031	0.023	0.030	0.022	0.026	0.031
3	0.0990	0.161	0.145	0.070	0.064	0.095	0.082	0.035	0.027	0.034	0.026	0.030	0.037
4	0.1120	0.183	0.166	0.079	0.072	0.107	0.094	0.039	0.031	0.038	0.030	0.035	0.037
5	0.1250	0.205	0.187	0.088	0.081	0.120	0.106	0.043	0.035	0.042	0.033	0.038	0.046
6	0.1380	0.226	0.208	0.096	0.089	0.132	0.118	0.048	0.039	0.045	0.035	0.043	0.046
8	0.1640	0.270	0.250	0.113	0.106	0.156	0.141	0.054	0.045	0.065	0.054	0.043	0.046
10	0.1900	0.313	0.292	0.130	0.123	0.180	0.165	0.060	0.050	0.075	0.064	0.043	0.046
12	0.2160	0.357	0.334	0.148	0.139	0.205	0.188	0.067	0.056	0.087	0.074	0.053	0.046
1/4	0.2500	0.414	0.389	0.170	0.161	0.237	0.219	0.075	0.064	0.102	0.087	0.062	0.062
5/16	0.3125	0.518	0.490	0.211	0.201	0.295	0.276	0.084	0.072	0.130	0.110	0.078	0.070
3/8	0.3750	0.622	0.590	0.253	0.242	0.355	0.333	0.094	0.081	0.154	0.134	0.094	0.070

GENERAL NOTE: For additional requirements, refer to para. 2.

NOTES:

(1) Drilled hole shall be approximately perpendicular to the axis of slot and may be permitted to break through bottom of the slot. Edges of the hole shall be free from burrs.

(2) A slight rounding of the edges at periphery of head shall be permissible provided the diameter of the bearing circle is equal to no less than 90% of the specified minimum head diameter.

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

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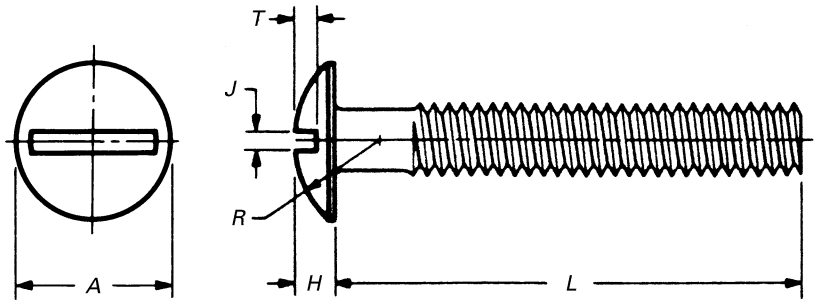


Table 12A Dimensions of Slotted Truss Head Machine Screws

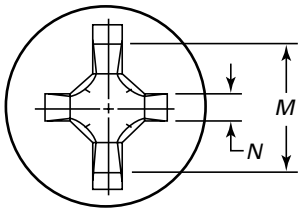
Nominal Size or Basic Screw Diameter [Note (1)]		Head Diameter, *A*		Head Height, *H*		Head Radius, *R*, Max.	Slot Width, *J*		Slot Depth, *T*	
		Max.	Min.	Max.	Min.		Max.	Min.	Max.	Min.
0000	0.0210	0.049	0.043	0.014	0.010	0.032	0.009	0.005	0.009	0.005
000	0.0340	0.077	0.071	0.022	0.018	0.051	0.013	0.009	0.013	0.009
00	0.0470	0.106	0.098	0.030	0.024	0.070	0.017	0.010	0.018	0.012
0	0.0600	0.131	0.119	0.037	0.029	0.087	0.023	0.016	0.022	0.014
1	0.0730	0.164	0.149	0.045	0.037	0.107	0.026	0.019	0.027	0.018
2	0.0860	0.194	0.180	0.053	0.044	0.129	0.031	0.023	0.031	0.022
3	0.0990	0.226	0.211	0.061	0.051	0.151	0.035	0.027	0.036	0.026
4	0.1120	0.257	0.241	0.069	0.059	0.169	0.039	0.031	0.040	0.030
5	0.1250	0.289	0.272	0.078	0.066	0.191	0.043	0.035	0.045	0.034
6	0.1380	0.321	0.303	0.086	0.074	0.211	0.048	0.039	0.050	0.037
8	0.1640	0.384	0.364	0.102	0.088	0.254	0.054	0.045	0.058	0.045
10	0.1900	0.448	0.425	0.118	0.103	0.283	0.060	0.050	0.068	0.053
12	0.2160	0.511	0.487	0.134	0.118	0.336	0.067	0.056	0.077	0.061
1/4	0.2500	0.573	0.546	0.150	0.133	0.375	0.075	0.064	0.087	0.070
5/16	0.3125	0.698	0.666	0.183	0.162	0.457	0.084	0.072	0.106	0.085
3/8	0.3750	0.823	0.787	0.215	0.191	0.538	0.094	0.081	0.124	0.100
7/16	0.4375	0.948	0.907	0.248	0.221	0.619	0.094	0.081	0.142	0.116
1/2	0.5000	1.073	1.028	0.280	0.250	0.701	0.106	0.091	0.161	0.131
9/16	0.5625	1.198	1.149	0.312	0.279	0.783	0.118	0.102	0.179	0.146
5/8	0.6250	1.323	1.269	0.345	0.309	0.863	0.133	0.116	0.196	0.162
3/4	0.7500	1.573	1.511	0.410	0.368	1.024	0.149	0.131	0.234	0.182

GENERAL NOTE: For additional requirements, refer to para. 2.

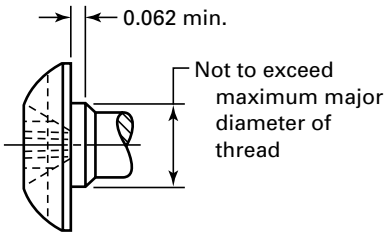
NOTE:

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

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This type of recess has a large center opening, tapered wings, and a blunt bottom, with top edges relieved or rounded. A slot runs parallel to one pair of recess wings.



Optional Shoulder for Long Screws With Reduced Body

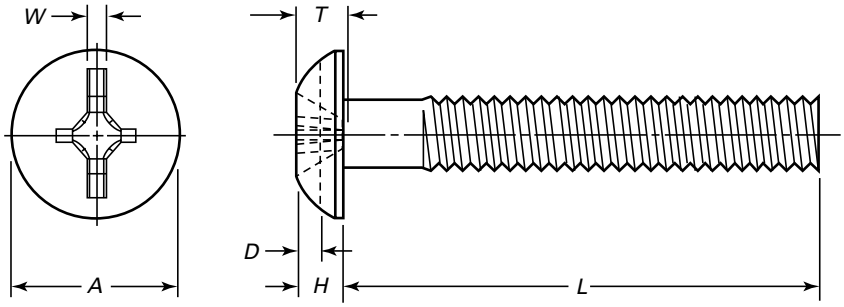


Table 12B Dimensions of Combination Slotted — Type I Cross Recessed Truss Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]		Head Diameter, *A*		Head Height, *H*		Slot Width, *W*		Slot Depth, *D* [Note (2)]		Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size	Recess Penetration Gaging Depth, *P*	
		Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.					Max.	Min.
0	0.0600	0.131	0.119	0.037	0.029	0.023	0.016	0.022	0.013	0.056	0.028	0.013	0	0.030	0.012
1	0.0730	0.164	0.149	0.045	0.037	0.026	0.019	0.027	0.016	0.064	0.036	0.014	0	0.038	0.020
2	0.0860	0.194	0.180	0.053	0.044	0.031	0.023	0.031	0.020	0.097	0.050	0.018	1	0.052	0.034
3	0.0990	0.226	0.211	0.061	0.051	0.035	0.027	0.036	0.023	0.103	0.057	0.018	1	0.059	0.042
4	0.1120	0.257	0.241	0.069	0.059	0.039	0.031	0.040	0.027	0.105	0.060	0.018	1	0.062	0.044
5	0.1250	0.289	0.272	0.078	0.066	0.043	0.035	0.045	0.030	0.121	0.076	0.019	1	0.078	0.060
6	0.1380	0.321	0.303	0.086	0.074	0.048	0.039	0.050	0.033	0.151	0.071	0.027	2	0.073	0.048
8	0.1640	0.384	0.364	0.102	0.088	0.054	0.045	0.058	0.040	0.166	0.086	0.029	2	0.088	0.063
10	0.1900	0.448	0.425	0.118	0.103	0.060	0.050	0.068	0.048	0.181	0.102	0.030	2	0.104	0.079
12	0.2160	0.511	0.487	0.134	0.118	0.067	0.056	0.077	0.055	0.241	0.115	0.032	3	0.111	0.086
1/4	0.2500	0.573	0.546	0.150	0.133	0.075	0.064	0.087	0.063	0.256	0.130	0.033	3	0.126	0.101
5/16	0.3125	0.698	0.666	0.183	0.162	0.084	0.072	0.106	0.076	0.345	0.180	0.059	4	0.173	0.148
3/8	0.3750	0.823	0.787	0.215	0.191	0.094	0.081	0.124	0.090	0.376	0.214	0.063	4	0.206	0.182
7/16	0.4375	0.948	0.907	0.248	0.221	0.094	0.081	0.142	0.104	0.407	0.244	0.068	4	0.237	0.212
1/2	0.5000	1.073	1.028	0.280	0.250	0.106	0.091	0.161	0.118	0.437	0.275	0.072	4	0.268	0.243
9/16	0.5625	1.198	1.149	0.312	0.279	0.118	0.102	0.179	0.131	0.439	0.290	0.074	4	0.282	0.258
5/8	0.6250	1.323	1.269	0.345	0.309	0.133	0.116	0.196	0.146	0.547	0.305	0.077	5	0.289	0.256
3/4	0.7500	1.573	1.511	0.410	0.368	0.149	0.131	0.234	0.164	0.608	0.368	0.085	5	0.351	0.319

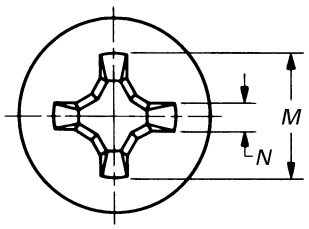
GENERAL NOTE: For additional requirements, refer to para. 2.

NOTES:

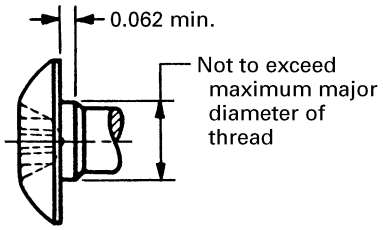
(1) Where specifying nominal size in decimals, zeros preceding the decimal and in the fourth decimal place shall be omitted.

(2) Due to the underfill of material caused by the combination recess, the minimum slot depths are approximately 10% lower than slotted truss heads.

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This type of recess has a large center opening, tapered wings, and blunt bottom, with all edges relieved or rounded.



Optional Shoulder for Long Screws With Reduced Body

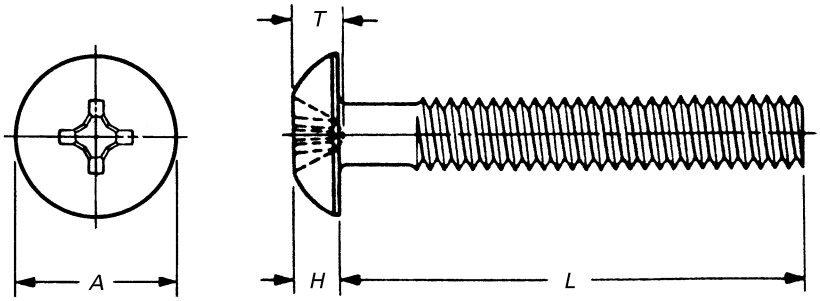


Table 12C Dimensions of Type I Cross Recessed Truss Head Machine Screws

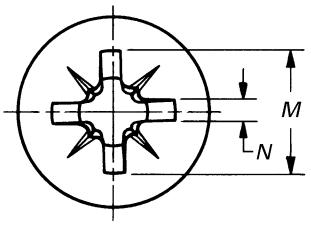
Nominal Size or Basic Screw Diameter [Note (1)]		Head Diameter, *A*		Head Height, *H*		Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size	Recess Penetration Gaging Depth	
		Max.	Min.	Max.	Min.					Max.	Min.
0	0.0600	0.131	0.119	0.037	0.029	0.056	0.028	0.013	0	0.030	0.012
1	0.0730	0.164	0.149	0.045	0.037	0.064	0.036	0.014	0	0.038	0.020
2	0.0860	0.194	0.180	0.053	0.044	0.097	0.050	0.018	1	0.052	0.034
3	0.0990	0.226	0.211	0.061	0.051	0.103	0.057	0.018	1	0.059	0.042
4	0.1120	0.257	0.241	0.069	0.059	0.105	0.060	0.018	1	0.062	0.044
5	0.1250	0.289	0.272	0.078	0.066	0.121	0.076	0.019	1	0.078	0.060
6	0.1380	0.321	0.303	0.086	0.074	0.151	0.071	0.027	2	0.073	0.048
8	0.1640	0.384	0.364	0.102	0.088	0.166	0.086	0.029	2	0.088	0.063
10	0.1900	0.448	0.425	0.118	0.103	0.181	0.102	0.030	2	0.104	0.079
12	0.2160	0.511	0.487	0.134	0.118	0.241	0.115	0.032	3	0.111	0.086
1/4	0.2500	0.573	0.546	0.150	0.133	0.256	0.130	0.033	3	0.126	0.101
5/16	0.3125	0.698	0.666	0.183	0.162	0.345	0.180	0.059	4	0.173	0.148
3/8	0.3750	0.823	0.787	0.215	0.191	0.376	0.214	0.063	4	0.206	0.182
7/16	0.4375	0.948	0.907	0.248	0.221	0.407	0.244	0.068	4	0.237	0.212
1/2	0.5000	1.073	1.028	0.280	0.250	0.437	0.275	0.072	4	0.268	0.243
9/16	0.5625	1.198	1.149	0.312	0.279	0.439	0.290	0.074	4	0.282	0.258
5/8	0.6250	1.323	1.269	0.345	0.309	0.547	0.305	0.077	5	0.289	0.256
3/4	0.7500	1.573	1.511	0.410	0.368	0.608	0.368	0.085	5	0.351	0.319

GENERAL NOTE: For additional requirements, refer to para. 2.

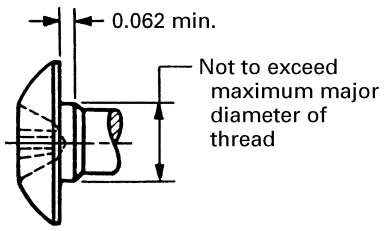
NOTE:

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This type of recess has a large center opening, wide straight wings, and blunt bottom, with all edges relieved or rounded.



Optional Shoulder for Long Screws With Reduced Body

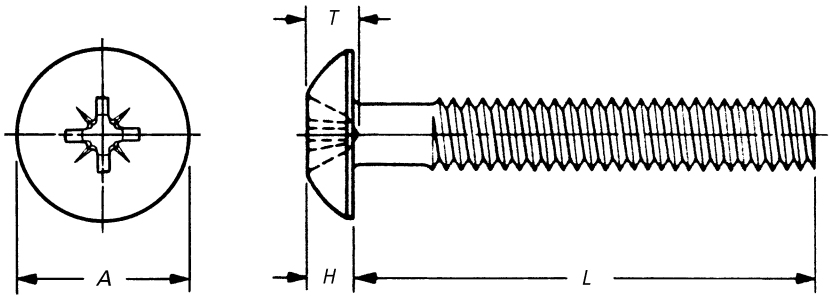


Table 12D Dimensions of Type IA Cross Recessed Truss Head Machine Screws

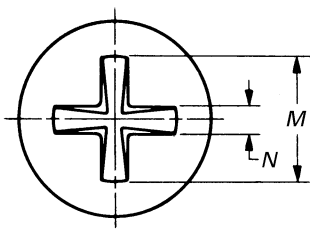
Nominal Size or Basic Screw Diameter [Note (1)]		Head Diameter, *A*		Head Height, *H*		Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size	Recess Penetration Gaging Depth	
		Max.	Min.	Max.	Min.					Max.	Min.
0	0.0600	0.131	0.119	0.037	0.029	0.055	0.029	0.018	0	0.030	0.014
1	0.0730	0.164	0.149	0.045	0.037	0.063	0.037	0.018	0	0.038	0.022
2	0.0860	0.194	0.180	0.053	0.044	0.091	0.051	0.029	1	0.049	0.033
3	0.0990	0.226	0.211	0.061	0.051	0.098	0.058	0.029	1	0.056	0.040
4	0.1120	0.257	0.241	0.069	0.059	0.101	0.061	0.029	1	0.059	0.043
5	0.1250	0.289	0.272	0.078	0.066	0.117	0.077	0.030	1	0.075	0.059
6	0.1380	0.321	0.303	0.086	0.074	0.141	0.071	0.041	2	0.065	0.047
8	0.1640	0.384	0.364	0.102	0.088	0.155	0.085	0.041	2	0.079	0.061
10	0.1900	0.448	0.425	0.118	0.103	0.171	0.101	0.042	2	0.095	0.077
12	0.2160	0.511	0.487	0.134	0.118	0.227	0.113	0.055	3	0.101	0.083
1/4	0.2500	0.573	0.546	0.150	0.133	0.241	0.127	0.056	3	0.115	0.097
5/16	0.3125	0.698	0.666	0.183	0.162	0.326	0.178	0.086	4	0.161	0.143
3/8	0.3750	0.823	0.787	0.215	0.191	0.357	0.210	0.086	4	0.192	0.174
7/16	0.4375	0.948	0.907	0.248	0.221	0.387	0.240	0.086	4	0.223	0.205
1/2	0.5000	1.073	1.028	0.280	0.250	0.415	0.269	0.086	4	0.251	0.233
9/16	0.5625	1.198	1.149	0.312	0.279	0.420	0.274	0.086	4	0.256	0.238
5/8	0.6250	1.323	1.269	0.345	0.309	0.524	0.293	0.097	5	0.266	0.245
3/4	0.7500	1.573	1.511	0.410	0.368	0.581	0.351	0.098	5	0.323	0.302

GENERAL NOTE: For additional requirements, refer to para. 2.

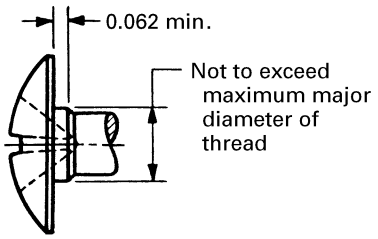
NOTE:

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

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This type of recess consists of two intersecting slots with parallel sides converging to a slightly truncated apex at bottom of recess.



Optional Shoulder for Long Screws With Reduced Body

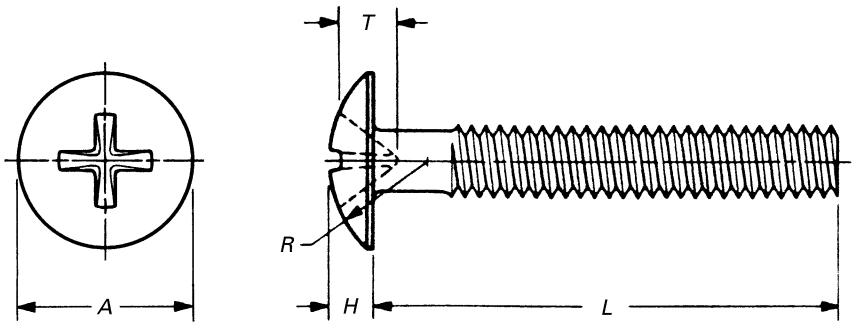


Table 12E Dimensions of Type II Cross Recessed Truss Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]		Head Diameter, *A*		Head Height, *H*		Head Radius, *R*, Min.	Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size [Note (2)]	Recess Penetration Gaging Depth	
		Max.	Min.	Max.	Min.						Max.	Min.
0	0.0600	0.131	0.119	0.037	0.029	0.087	0.070	0.031	0.021	...	[Note (3)]	[Note (3)]
1	0.0730	0.164	0.149	0.045	0.037	0.107	0.087	0.042	0.023	...	[Note (3)]	[Note (3)]
2	0.0860	0.194	0.180	0.053	0.044	0.129	0.105	0.054	0.026	...	0.033	0.024
3	0.0990	0.226	0.211	0.061	0.051	0.151	0.122	0.065	0.028	...	0.045	0.035
4	0.1120	0.257	0.241	0.069	0.059	0.169	0.139	0.074	0.031	...	0.056	0.046
5	0.1250	0.289	0.272	0.078	0.066	0.191	0.157	0.086	0.033	...	0.068	0.057
6	0.1380	0.321	0.303	0.086	0.074	0.211	0.175	0.097	0.035	...	0.079	0.068
8	0.1640	0.384	0.364	0.102	0.088	0.254	0.209	0.115	0.041	...	0.102	0.091
10	0.1900	0.448	0.425	0.118	0.103	0.283	0.244	0.138	0.046	...	0.126	0.113
12	0.2160	0.511	0.487	0.134	0.118	0.336	0.279	0.160	0.051	...	0.148	0.136
1/4	0.2500	0.573	0.546	0.150	0.133	0.375	0.313	0.174	0.057	...	0.171	0.157
5/16	0.3125	0.698	0.666	0.183	0.162	0.457	0.382	0.219	0.067	...	0.217	0.201
3/8	0.3750	0.823	0.787	0.215	0.191	0.538	0.446	0.261	0.076	...	0.259	0.242
7/16	0.4375	0.948	0.907	0.248	0.221	0.619	0.511	0.304	0.086	...	0.303	0.284
1/2	0.5000	1.073	1.028	0.280	0.250	0.701	0.588	0.354	0.097	...	0.354	0.333
9/16	0.5625	1.198	1.149	0.312	0.279	0.783	0.588	0.354	0.097	...	0.354	0.333
5/8	0.6250	1.323	1.269	0.345	0.309	0.863	0.588	0.354	0.097	...	0.354	0.333
3/4	0.7500	1.573	1.511	0.410	0.368	1.024	0.588	0.354	0.097	...	0.354	0.333

GENERAL NOTE: For additional requirements, refer to para. 2.

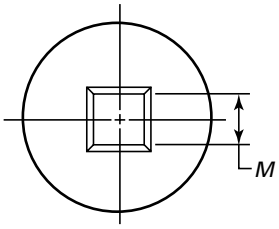
NOTES:

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

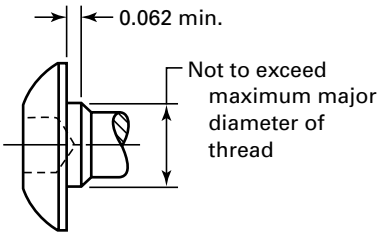
(2) Point same on all drivers.

(3) Not practical to gage.

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This type of recess has a square center opening, slightly tapered side walls, and a conical bottom, with top edges relieved or rounded.



Optional Shoulder for Long Screws With Reduced Body

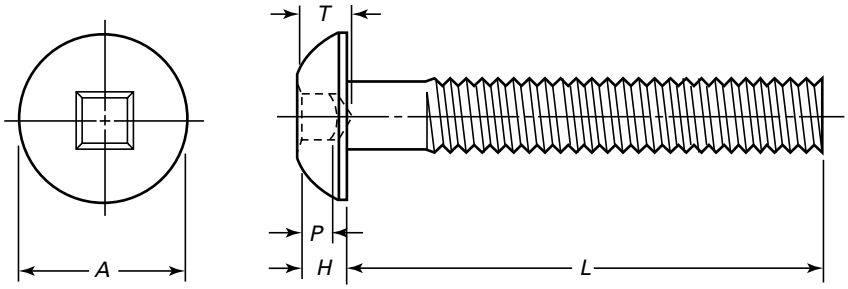


Table 12F Dimensions of Type III Square Recessed Truss Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]		Head Diameter, *A*		Head Height, *H*		Recess Across Flats, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Size [Note (2)]	Recess Penetration Gaging Depth, *P*, [Note (3)]	
		Max.	Min.	Max.	Min.				Max.	Min.
2	0.0860	0.194	0.180	0.053	0.044	0.050	0.057	00	0.033	0.028
3	0.0990	0.226	0.211	0.061	0.051	0.070	0.066	0	0.038	0.028
4	0.1120	0.257	0.241	0.069	0.059	0.070	0.066	0	0.038	0.028
5	0.1250	0.289	0.272	0.078	0.066	0.091	0.096	1S	0.055	0.040
6	0.1380	0.321	0.303	0.086	0.074	0.091	0.096	1S	0.055	0.040
8	0.1640	0.384	0.364	0.102	0.088	0.112	0.115	2S	0.063	0.048
10	0.1900	0.448	0.425	0.128	0.113	0.112	0.115	2R	0.075	0.060
12	0.2160	0.511	0.487	0.134	0.118	0.133	0.143	3S	0.080	0.065
1/4	0.2500	0.573	0.546	0.150	0.133	0.133	0.143	3S	0.080	0.065
5/16	0.3125	0.698	0.666	0.183	0.162	0.191	0.194	4R	0.100	0.085
3/8	0.3750	0.823	0.787	0.215	0.191	0.191	0.194	4R	0.100	0.085

GENERAL NOTE: For additional requirements, refer to para. 2.

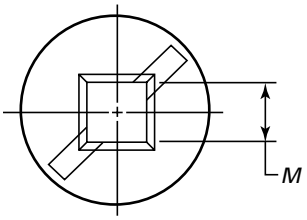
NOTES:

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

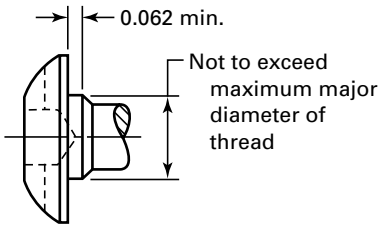
(2) "R" in the recess size tabulation means regular depth recess, and the "S" means short depth recess.

(3) Square recesses incorporate a slight taper on the sides of the recess. This taper can result in loss of penetration gaging depth on finished fasteners due to the build up of plating in the recesses. The recess penetration dimensions specified here are for finished (plated) product. Manufacturers should be advised that they should not use all this tolerance in the heading process, or an out of tolerance condition could exist after plating.

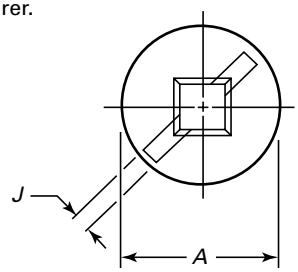
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This type of recess has a square center opening, slightly tapered side walls, a conical bottom, with top edges relieved or rounded. A slot runs through the recess. Slot may run either diagonal or across flats at the option of the manufacturer.



Optional Shoulder for Long Screws With Reduced Body



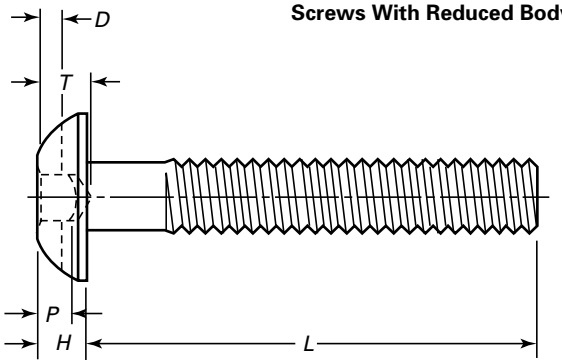


Table 12G Dimensions of Combination Slotted — Type III Square Recessed Truss Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]		Head Diameter, *A*		Head Height, *H*		Slot Width, *J*		Slot Depth, *D* [Note (2)]		Recess Across Flats, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Size [Note (3)]	Recess Penetration Gaging Depth, *P* [Note (4)]	
		Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.				Max.	Min.
2	0.0860	0.194	0.180	0.053	0.044	0.031	0.023	0.031	0.020	0.050	0.057	00	0.033	0.028
3	0.0990	0.226	0.211	0.061	0.051	0.035	0.027	0.036	0.023	0.070	0.066	0	0.038	0.028
4	0.1120	0.257	0.241	0.069	0.059	0.039	0.031	0.040	0.027	0.070	0.066	0	0.038	0.028
5	0.1250	0.289	0.272	0.078	0.066	0.043	0.035	0.045	0.030	0.091	0.096	1S	0.055	0.040
6	0.1380	0.321	0.303	0.086	0.074	0.048	0.039	0.050	0.033	0.091	0.096	1S	0.055	0.040
8	0.1640	0.384	0.364	0.102	0.088	0.054	0.045	0.058	0.040	0.112	0.115	2S	0.063	0.048
10	0.1900	0.448	0.425	0.128	0.113	0.060	0.050	0.068	0.048	0.112	0.115	2R	0.075	0.060
12	0.2160	0.511	0.487	0.134	0.118	0.067	0.056	0.077	0.055	0.133	0.143	3S	0.080	0.065
1/4	0.2500	0.573	0.546	0.150	0.133	0.075	0.064	0.087	0.063	0.133	0.143	3S	0.080	0.065
5/16	0.3125	0.698	0.666	0.183	0.162	0.084	0.072	0.106	0.076	0.191	0.194	4R	0.100	0.085
3/8	0.3750	0.823	0.787	0.215	0.191	0.094	0.081	0.124	0.090	0.191	0.194	4R	0.100	0.085

GENERAL NOTE: For additional requirements, refer to para. 2.

NOTES:

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

(2) Due to the underfill of material caused by the combination recess, the minimum slot depths are approximately 10% lower than slotted truss heads.

(3) "R" in the recess size tabulation means regular depth recess, and the "S" means short depth recess.

(4) Square recesses incorporate a slight taper on the sides of the recess. This taper can result in loss of penetration gaging depth on finished fasteners due to the build up of plating in the recesses. The recess penetration dimensions specified here are for finished (plated) product. Manufacturers should be advised that they should not use all this tolerance in the heading process, or an out of tolerance condition could exist after plating.

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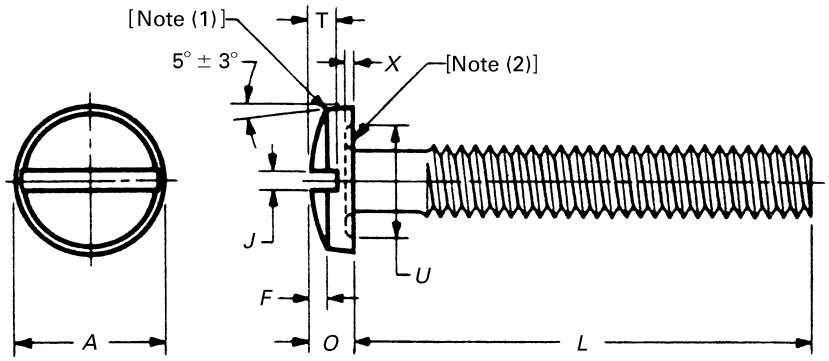


Table 13A Dimensions of Slotted Binding Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (3)]		Head Diameter, *A*		Total Head Height, *O*		Head Oval Height, *F*		Slot Width, *J*		Slot Depth, *T*		Undercut Diameter, *U* [Note (2)]		Undercut Depth, *X* [Note (2)]	
		Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
0000	0.0210	0.046	0.040	0.014	0.009	0.006	0.003	0.008	0.004	0.009	0.005	. . ..	. . .	. . .	. . .
000	0.0340	0.073	0.067	0.021	0.015	0.008	0.005	0.012	0.006	0.013	0.009	. . .	. . .	. . .	. . .
00	0.0470	0.098	0.090	0.028	0.023	0.011	0.007	0.017	0.010	0.018	0.012	. . .	. . .	. . .	. . .
0	0.0600	0.126	0.119	0.032	0.026	0.012	0.008	0.023	0.016	0.018	0.009	0.098	0.086	0.007	0.002
1	0.0730	0.153	0.145	0.041	0.035	0.015	0.011	0.026	0.019	0.024	0.014	0.120	0.105	0.008	0.003
2	0.0860	0.181	0.171	0.050	0.043	0.018	0.013	0.031	0.023	0.030	0.020	0.141	0.124	0.010	0.005
3	0.0990	0.208	0.197	0.059	0.052	0.022	0.016	0.035	0.027	0.036	0.025	0.162	0.143	0.011	0.006
4	0.1120	0.235	0.223	0.068	0.061	0.025	0.018	0.039	0.031	0.042	0.030	0.184	0.161	0.012	0.007
5	0.1250	0.263	0.249	0.078	0.069	0.029	0.021	0.043	0.035	0.048	0.035	0.205	0.180	0.014	0.009
6	0.1380	0.290	0.275	0.087	0.078	0.032	0.024	0.048	0.039	0.053	0.040	0.226	0.199	0.015	0.010
8	0.1640	0.344	0.326	0.105	0.095	0.039	0.029	0.054	0.045	0.065	0.050	0.269	0.236	0.017	0.012
10	0.1900	0.399	0.378	0.123	0.112	0.045	0.034	0.060	0.050	0.077	0.060	0.312	0.274	0.020	0.015
12	0.2160	0.454	0.430	0.141	0.130	0.052	0.039	0.067	0.056	0.089	0.070	0.354	0.311	0.023	0.018
1/4	0.2500	0.525	0.498	0.165	0.152	0.061	0.046	0.075	0.064	0.105	0.084	0.410	0.360	0.026	0.021
5/16	0.3125	0.656	0.622	0.209	0.194	0.077	0.059	0.084	0.072	0.134	0.108	0.513	0.450	0.032	0.027
3/8	0.3750	0.788	0.746	0.253	0.235	0.094	0.071	0.094	0.081	0.163	0.132	0.615	0.540	0.039	0.034

GENERAL NOTE: For additional requirements, refer to para. 2.

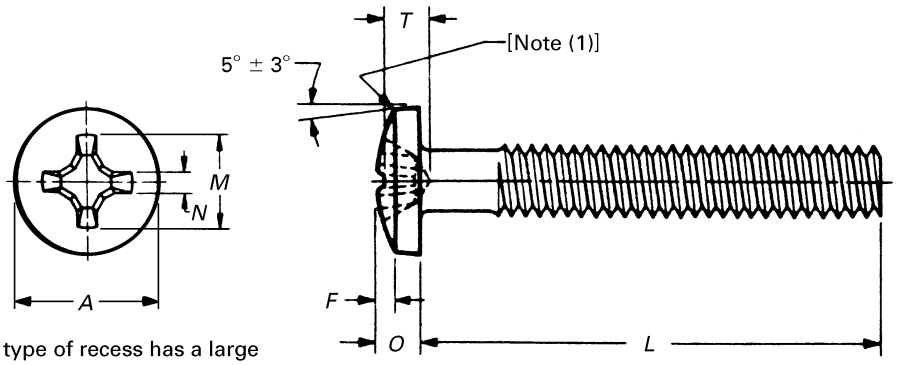
NOTES:

(1) Break sharp edge on head where spherical and conical surfaces meet.

(2) Unless otherwise specified by purchaser, slotted binding head machine screws shall not be undercut.

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

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This type of recess has a large center opening, tapered wings, and blunt bottom, with all edges relieved or rounded.

Table 13B Dimensions of Type I Cross Recessed Binding Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (2)]		Head Diameter, *A*		Total Head Height, *O*		Head Oval Height, *F*		Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size	Recess Penetration Gaging Depth	
		Max.	Min.	Max.	Min.	Max.	Min.					Max.	Min.
0	0.0600	0.126	0.119	0.032	0.026	0.012	0.008	0.060	0.031	0.013	0	0.033	0.016
1	0.0730	0.153	0.145	0.041	0.035	0.015	0.011	0.067	0.038	0.014	0	0.040	0.023
2	0.0860	0.181	0.171	0.050	0.043	0.018	0.013	0.093	0.049	0.017	1	0.051	0.034
3	0.0990	0.208	0.197	0.059	0.052	0.022	0.016	0.103	0.059	0.017	1	0.061	0.044
4	0.1120	0.235	0.223	0.068	0.061	0.025	0.018	0.111	0.068	0.017	1	0.070	0.052
5	0.1250	0.263	0.249	0.078	0.069	0.029	0.021	0.141	0.063	0.025	2	0.064	0.040
6	0.1380	0.290	0.275	0.087	0.078	0.032	0.024	0.153	0.076	0.026	2	0.077	0.053
8	0.1640	0.344	0.326	0.105	0.095	0.039	0.029	0.179	0.102	0.028	2	0.103	0.079
10	0.1900	0.399	0.378	0.123	0.112	0.045	0.034	0.198	0.121	0.029	2	0.123	0.098
12	0.2160	0.454	0.430	0.141	0.130	0.052	0.039	0.260	0.138	0.032	3	0.134	0.109
1/4	0.2500	0.525	0.498	0.165	0.152	0.061	0.046	0.274	0.152	0.046	3	0.147	0.123
5/16	0.3125	0.656	0.622	0.209	0.194	0.077	0.059	0.343	0.183	0.068	4	0.175	0.152
3/8	0.3750	0.788	0.746	0.253	0.235	0.094	0.071	0.393	0.235	0.076	4	0.227	0.203

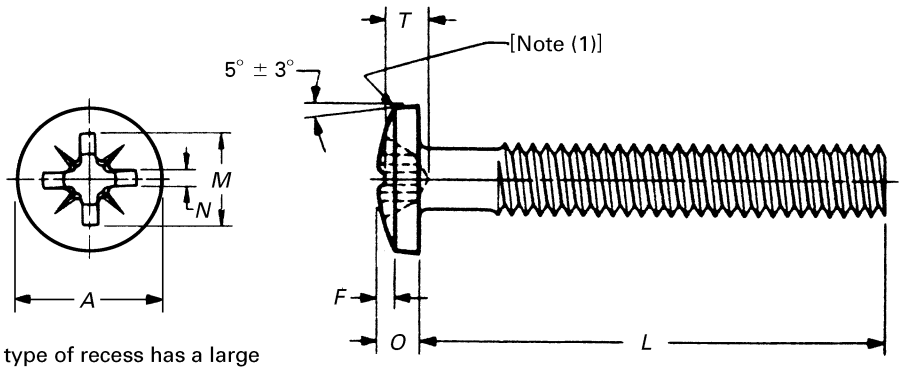
GENERAL NOTE: For additional requirements, refer to para. 2.

NOTES:

(1) Break sharp edge on head where spherical and conical surfaces meet.

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

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This type of recess has a large center opening, wide straight wings, and blunt bottom, with all edges relieved or rounded.

Table 13C Dimensions of Type IA Cross Recessed Binding Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (2)]		Head Diameter, *A*		Total Head Height, *O*		Head Oval Height, *F*		Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size	Recess Penetration Gaging Depth	
		Max.	Min.	Max.	Min.	Max.	Min.					Max.	Min.
0	0.0600	0.126	0.119	0.032	0.026	0.012	0.008	0.060	0.034	0.018	0	0.034	0.018
1	0.0730	0.153	0.145	0.041	0.035	0.015	0.011	0.067	0.041	0.018	0	0.043	0.027
2	0.0860	0.181	0.171	0.050	0.043	0.018	0.013	0.097	0.057	0.029	1	0.054	0.038
3	0.0990	0.208	0.197	0.059	0.052	0.022	0.016	0.102	0.062	0.029	1	0.059	0.043
4	0.1120	0.235	0.223	0.068	0.061	0.025	0.018	0.110	0.070	0.029	1	0.068	0.052
5	0.1250	0.263	0.249	0.078	0.069	0.029	0.021	0.137	0.066	0.040	2	0.059	0.041
6	0.1380	0.290	0.275	0.087	0.078	0.032	0.024	0.149	0.078	0.040	2	0.072	0.054
8	0.1640	0.344	0.326	0.105	0.095	0.039	0.029	0.174	0.104	0.041	2	0.097	0.079
10	0.1900	0.399	0.378	0.123	0.112	0.045	0.034	0.192	0.122	0.041	2	0.115	0.097
12	0.2160	0.454	0.430	0.141	0.130	0.052	0.039	0.253	0.138	0.056	3	0.125	0.107
1/4	0.2500	0.525	0.498	0.165	0.152	0.061	0.046	0.267	0.152	0.057	3	0.139	0.121
5/16	0.3125	0.656	0.622	0.209	0.194	0.077	0.059	0.332	0.181	0.086	4	0.163	0.145
3/8	0.3750	0.788	0.746	0.253	0.235	0.094	0.071	0.380	0.231	0.086	4	0.213	0.195

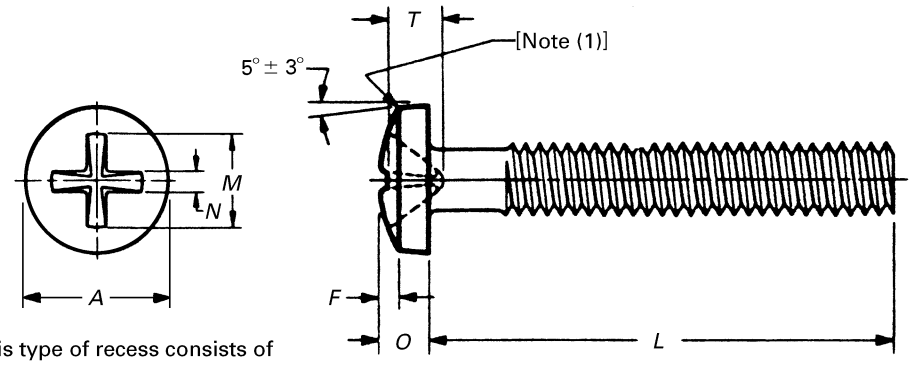
GENERAL NOTE: For additional requirements, refer to para. 2.

NOTES:

(1) Break sharp edge on head where spherical and conical surfaces meet.

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

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This type of recess consists of two intersecting slots with parallel sides converging to a slightly truncated apex at bottom of recess.

Table 13D Dimensions of Type II Cross Recessed Binding Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (2)]		Head Diameter, *A*		Total Head Height, *O*		Head Oval Height, *F*		Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size [Note (3)]	Recess Penetration Gaging Depth	
		Max.	Min.	Max.	Min.	Max.	Min.					Max.	Min.
0	0.0600	0.126	0.119	0.032	0.026	0.012	0.008	0.078	0.036	0.023	. . .	[Note (4)]	[Note (4)]
1	0.0730	0.153	0.145	0.041	0.035	0.015	0.011	0.092	0.045	0.025	. . .	[Note (4)]	[Note (4)]
2	0.0860	0.181	0.171	0.050	0.043	0.018	0.013	0.112	0.058	0.028	. . .	0.039	0.027
3	0.0990	0.208	0.197	0.059	0.052	0.022	0.016	0.130	0.070	0.031	. . .	0.051	0.039
4	0.1120	0.235	0.223	0.068	0.061	0.025	0.018	0.147	0.079	0.034	. . .	0.062	0.050
5	0.1250	0.263	0.249	0.078	0.069	0.029	0.021	0.165	0.091	0.036	. . .	0.074	0.061
6	0.1380	0.290	0.275	0.087	0.078	0.032	0.024	0.183	0.103	0.039	. . .	0.086	0.073
8	0.1640	0.344	0.326	0.105	0.095	0.039	0.029	0.216	0.119	0.044	. . .	0.108	0.094
10	0.1900	0.399	0.378	0.123	0.112	0.045	0.034	0.239	0.134	0.047	. . .	0.123	0.109
12	0.2160	0.454	0.430	0.141	0.130	0.052	0.039	0.284	0.163	0.054	. . .	0.153	0.137
1/4	0.2500	0.525	0.498	0.165	0.152	0.061	0.046	0.320	0.179	0.059	. . .	0.176	0.160
5/16	0.3125	0.656	0.622	0.209	0.194	0.077	0.059	0.403	0.233	0.072	. . .	0.232	0.214
3/8	0.3750	0.788	0.746	0.253	0.235	0.094	0.071	0.468	0.275	0.081	. . .	0.275	0.255

GENERAL NOTE: For additional requirements, refer to para. 2.

NOTES:

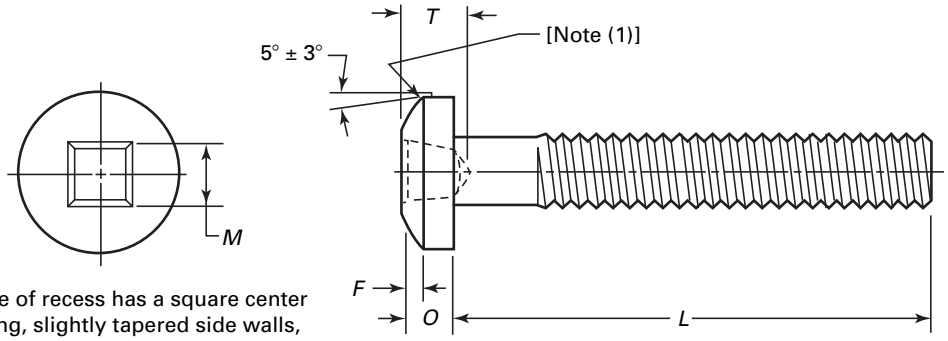
(1) Break sharp edge on head where spherical and conical surfaces meet.

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

(3) Point same on all drivers.

(4) Not practical to gage.

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This type of recess has a square center opening, slightly tapered side walls, and a conical bottom, with top edges relieved or rounded.

Table 13E Dimensions of Type III Square Recessed Binder Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (2)]		Head Diameter, *A*		Head Height, *O*		Head Oval Height, *F*, Ref.	Recess Across Flats, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Size [Note (3)]	Recess Penetration Gaging Depth, *P* [Note (4)]	
		Max.	Min.	Max.	Min.					Max.	Min.
3	0.0990	0.208	0.197	0.059	0.052	0.020	0.070	0.070	0	0.038	0.023
4	0.1120	0.235	0.223	0.068	0.061	0.022	0.070	0.070	0	0.038	0.023
5	0.1250	0.263	0.249	0.078	0.069	0.025	0.091	0.100	1S	0.055	0.040
6	0.1380	0.290	0.275	0.087	0.078	0.028	0.091	0.100	1S	0.055	0.040
8	0.1640	0.344	0.326	0.105	0.095	0.034	0.112	0.120	2S	0.063	0.048
10	0.1900	0.399	0.378	0.123	0.112	0.040	0.112	0.120	2S	0.063	0.048
12	0.2160	0.454	0.430	0.141	0.130	0.045	0.133	0.178	3S	0.080	0.065
1/4	0.2500	0.525	0.498	0.165	0.152	0.044	0.133	0.178	3S	0.080	0.065
5/16	0.3125	0.656	0.622	0.209	0.194	0.068	0.191	0.199	4R	0.100	0.080
3/8	0.3750	0.788	0.746	0.253	0.235	0.083	0.191	0.199	4R	0.100	0.080

GENERAL NOTE: For additional requirements, refer to para. 2.

NOTES:

(1) Break sharp edge on head where spherical and conical surfaces meet.

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

(3) "R" in the recess size tabulation means regular depth recess, and the "S" means short depth recess.

(4) Square recesses incorporate a slight taper on the sides of the recess. This taper can result in loss of penetration gaging depth on finished fasteners due to the build up of plating in the recesses. The recess penetration dimensions specified here are for finished (plated) product. Manufacturers should be advised that they should not use all this tolerance in the heading process, or an out of tolerance condition could exist after plating.

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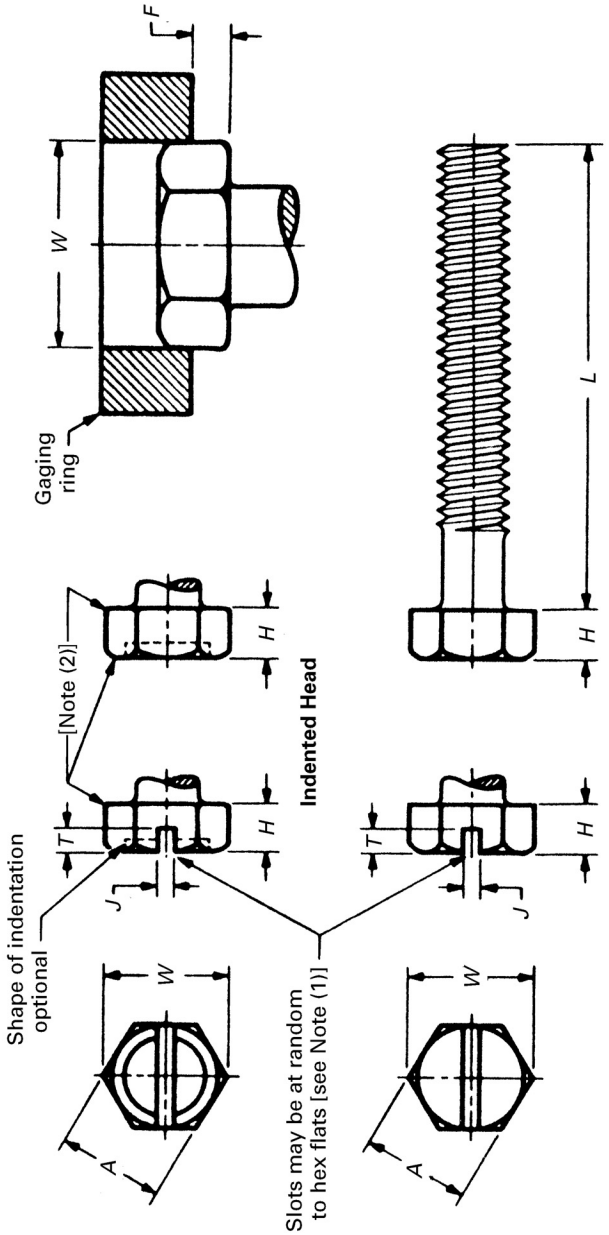


Table 14A Illustration

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Table 14A Dimensions of Plain and Slotted Regular and Large Hex Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (3)]		Regular Head [Note (4)]			Large Head [Notes (4), (7)]			Head Height, *H*		Slot Width, *J* [Note (1)]		Slot Depth, *T* [Notes (1), (8)]		Protrusion Beyond Gaging Ring, *F*, Min. [Note (6)]
		Width Across Flats, *A* [Note (5)]		Across Corners, *W*, Min. [Notes (5), (6)]	Width Across Flats, *A* [Note (5)]		Across Corners, *W*, Min. [Notes (5), (6)]							
		Max.	Min.		Max.	Min.		Max.	Min.	Max.	Min.	Max.	Min.	
1	0.0730	0.125	0.120	0.134	...	...	...	0.044	0.036	...	...	...	...	0.022
2	0.0860	0.125	0.120	0.134	...	...	...	0.050	0.040	...	...	...	...	0.024
3	0.0990	0.188	0.181	0.202	...	...	...	0.055	0.044	...	...	...	...	0.026
4	0.1120	0.188	0.181	0.202	0.219	0.213	0.238	0.060	0.049	0.039	0.031	0.036	0.025	0.029
5	0.1250	0.188	0.181	0.202	0.250	0.244	0.272	0.070	0.058	0.043	0.035	0.042	0.030	0.035
6	0.1380	0.250	0.244	0.272	...	...	...	0.093	0.080	0.048	0.039	0.046	0.033	0.048
8	0.1640	0.250	0.244	0.272	0.312	0.305	0.340	0.110	0.096	0.054	0.045	0.066	0.052	0.058
10	0.1900	0.312	0.305	0.340	...	...	...	0.120	0.105	0.060	0.050	0.072	0.057	0.063
12	0.2160	0.312	0.305	0.340	0.375	0.367	0.409	0.155	0.139	0.067	0.056	0.093	0.077	0.083
1/4	0.2500	0.375	0.367	0.409	0.438	0.428	0.477	0.190	0.172	0.075	0.064	0.101	0.083	0.103
5/16	0.3125	0.500	0.489	0.545	...	...	...	0.230	0.208	0.084	0.072	0.122	0.100	0.125
3/8	0.3750	0.562	0.551	0.614	...	...	...	0.295	0.270	0.094	0.081	0.156	0.131	0.162

GENERAL NOTES:

(a) For additional requirements, refer to para. 2.

(b) For reference, see Table 14A Illustration on previous page.

NOTES:

(1) Unless otherwise specified by purchaser, hex head machine screws are not slotted.

(2) A slight rounding of all edges and corners of the hex surfaces of indented hex heads shall be permissible provided the diameter of the bearing circle is equal to no less than 90% of the specified minimum width across flats dimension.

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

(4) Unless otherwise specified by purchaser, regular hex heads shall be furnished, and both regular and large head styles may be of indented head, trimmed head, or fully upset head construction, at the option of manufacturer.

(5) Dimensions across flats and across corners of the head shall be measured at the point of maximum metal. Taper of sides of hex (angle between one side and the axis) shall not exceed 2 deg or 0.004 in., whichever is greater, the specified width across flats being the large dimension.

(6) The rounding due to lack of fill on all six corners of the head shall be reasonably uniform and the width across corners of the head shall be such that when a sharp ring having an inside diameter equal to the specified minimum width across corners is placed on the top and bottom of the head, the head shall protrude by an amount equal to, or greater than, the *F* value tabulated. See Appendix II for across corners gaging of hex heads.

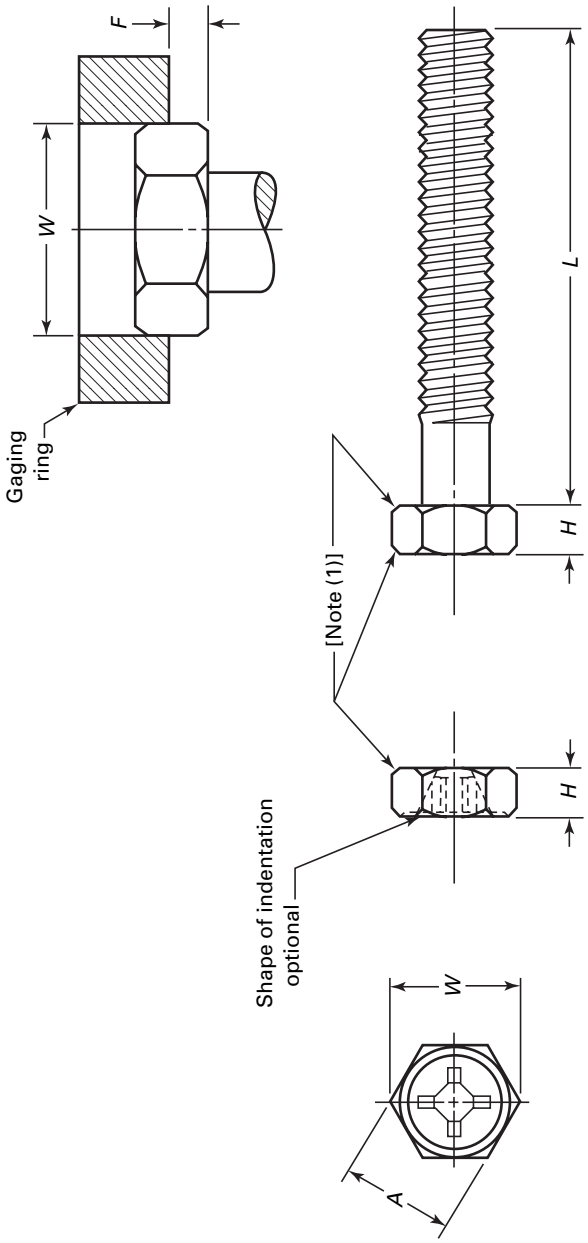
(7) Large hex head is intended for screw and washer assemblies (sems) as specified in ASME B18.13, and other applications requiring large bearing.

(8) Slot depth beyond bottom of indentation on indented heads shall not be less than one-third of the minimum slot depth specified.

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Table 14B Illustration

Indented Head



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Table 14B Dimensions of Type I Cross Recessed Indented Regular and Large Hex Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (2)]		Regular Head [Note (3)]			Large Head [Note (3)]			Head Height, *H*		Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref. [Note (6)]	Recess Width, *N*, Ref.	Driver Size	Recess Penetration Gaging Depth [Note (6)]		Protrusion Beyond Gaging Ring, *F*, Min. [Note (5)]
		Width Across Flats, *A* [Note (4)]		Across Corners, *W*, Min. [Notes (4), (5)]	Width Across Flats, *A* [Note (4)]		Across Corners, *W*, Min. [Notes (4), (5)]									
		Max.	Min.		Max.	Min.		Max.	Min.					Max.	Min.	
1	0.0730	0.125	0.120	0.134	...	...	...	0.044	0.036	0.072	0.052	0.014	0	0.054	0.036	0.022
2	0.0860	0.125	0.120	0.134	...	...	...	0.050	0.040	0.086	0.052	0.017	1	0.054	0.036	0.024
3	0.0990	0.188	0.181	0.202	...	...	...	0.055	0.044	0.092	0.058	0.017	1	0.060	0.042	0.026
4	0.1120	0.188	0.181	0.202	0.219	0.213	0.238	0.060	0.049	0.097	0.065	0.017	1	0.067	0.049	0.029
5	0.1250	0.188	0.181	0.202	0.250	0.244	0.272	0.070	0.058	0.105	0.074	0.017	1	0.076	0.058	0.035
6	0.1380	0.250	0.244	0.272	...	...	...	0.093	0.080	0.148	0.088	0.026	2	0.089	0.064	0.048
8	0.1640	0.250	0.244	0.272	0.312	0.305	0.340	0.110	0.096	0.168	0.114	0.029	2	0.115	0.090	0.058
10	0.1900	0.312	0.305	0.340	...	...	...	0.120	0.105	0.178	0.126	0.029	2	0.127	0.102	0.063
12	0.2160	0.312	0.305	0.340	0.375	0.367	0.409	0.155	0.139	0.247	0.157	0.033	3	0.152	0.127	0.083
1/4	0.2500	0.375	0.367	0.409	0.438	0.428	0.477	0.190	0.172	0.277	0.191	0.034	3	0.186	0.161	0.103
5/16	0.3125	0.500	0.489	0.545	...	...	...	0.230	0.208	0.359	0.242	0.055	4	0.234	0.210	0.125
3/8	0.3750	0.562	0.551	0.614	...	...	...	0.295	0.270	0.387	0.275	0.062	4	0.267	0.243	0.162

GENERAL NOTES:

(a) For additional requirements, refer to para. 2.

(b) For reference, see Table 14B Illustration on previous page.

NOTES:

(1) A slight rounding of all edges and corners of the hex surfaces of indented hex heads shall be permissible provided the diameter of the bearing circle is equal to no less than 90% of the specified minimum width across flats dimension.

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

(3) Unless otherwise specified by purchaser, regular hex heads shall be furnished. Large hex heads are intended for screws and washer assemblies (sems) as specified in ASME B18.13, and other applications requiring large bearing surfaces.

(4) Dimensions across flats and across corners of the head shall be measured at the point of maximum metal. Taper of sides of hex (angle between one side and the axis) shall not exceed 2 deg or 0.004 in., whichever is greater, the specified width across flats being the large dimension.

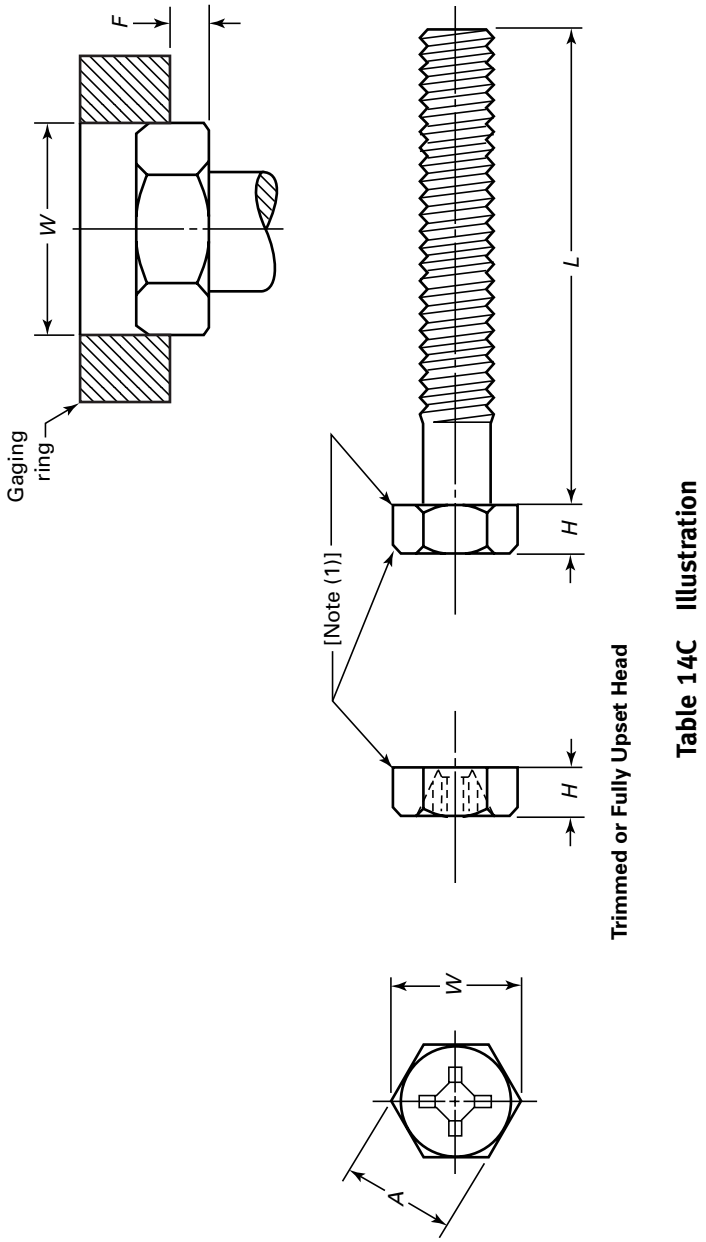
(5) The rounding due to lack of fill on all six corners of the hex shall be reasonably uniform and the width across corners shall be such that when a sharp ring having an inside diameter equal to the specified minimum width across corners is placed on the top and bottom of the head, the head shall protrude by an amount equal to, or greater than, the *F* value tabulated. See Appendix II for across corners gaging of hex heads.

(6) The recess depths and penetrations given are intended to include the depth of the indentation. Due to possible variations in the indentation depths, there could be variations in these dimensions. In these cases, the requirements are to be as agreed upon between the manufacturer and his customer.

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Table 14C Illustration

Trimmed or Fully Upset Head



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Table 14C Dimensions of Type I Cross Recessed Non-Indented Regular and Large Hex Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (2)]		Regular Head [Note (3)]			Large Head [Notes (3), (6)]			Head Height, *H*		Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size	Recess Penetration Gaging Depth		Protrusion Beyond Gaging Ring, *F*, Min. [Note (5)]
		Width Across Flats, *A* [Note (4)]		Across Corners, *W*, Min. [Notes (4), (5)]	Width Across Flats, *A* [Note (4)]		Across Corners, *W*, Min. [Notes (4), (5)]									
		Max.	Min.		Max.	Min.		Max.	Min.					Max.	Min.	
8	0.1640	0.250	0.244	0.272	0.312	0.305	0.340	0.110	0.096	0.183	0.110	0.031	2	0.110	0.087	0.058
10	0.1900	0.312	0.305	0.340	...	...	...	0.120	0.105	0.198	0.125	0.032	2	0.125	0.102	0.063
12	0.2160	0.312	0.305	0.340	0.375	0.367	0.409	0.155	0.139	0.262	0.145	0.035	3	0.139	0.116	0.083
1/4	0.2500	0.375	0.367	0.409	0.438	0.428	0.477	0.190	0.172	0.277	0.160	0.036	3	0.154	0.131	0.103
5/16	0.3125	0.500	0.489	0.545	...	...	...	0.230	0.208	0.359	0.205	0.061	4	0.196	0.174	0.125
3/8	0.3750	0.562	0.551	0.614	...	...	...	0.295	0.270	0.387	0.234	0.065	4	0.225	0.203	0.162

GENERAL NOTES:

(a) For additional requirements, refer to para. 2.

(b) For reference, see Table 14C Illustration on previous page.

NOTES:

(1) A slight rounding of all edges and corners of the hex surfaces of indented hex heads shall be permissible provided the diameter of the bearing circle is equal to no less than 90% of the specified minimum width across flats dimension.

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

(3) Unless otherwise specified by purchaser, regular hex heads shall be furnished. Large hex heads are intended for screws and washer assemblies (sems) as specified in ASME B18.13, and other applications requiring large bearing surfaces.

(4) Dimensions across flats and across corners of the head shall be measured at the point of maximum metal. Taper of sides of hex (angle between one side and the axis) shall not exceed 2 deg or 0.004 in., whichever is greater, the specified width across flats being the large dimension.

(5) The rounding due to lack of fill on all six corners of the hex shall be reasonably uniform and the width across corners shall be such that when a sharp ring having an inside diameter equal to the specified minimum width across corners is placed on the top and bottom of the head, the head shall protrude by an amount equal to, or greater than, the *F* value tabulated. See Appendix II for across corners gaging of hex heads.

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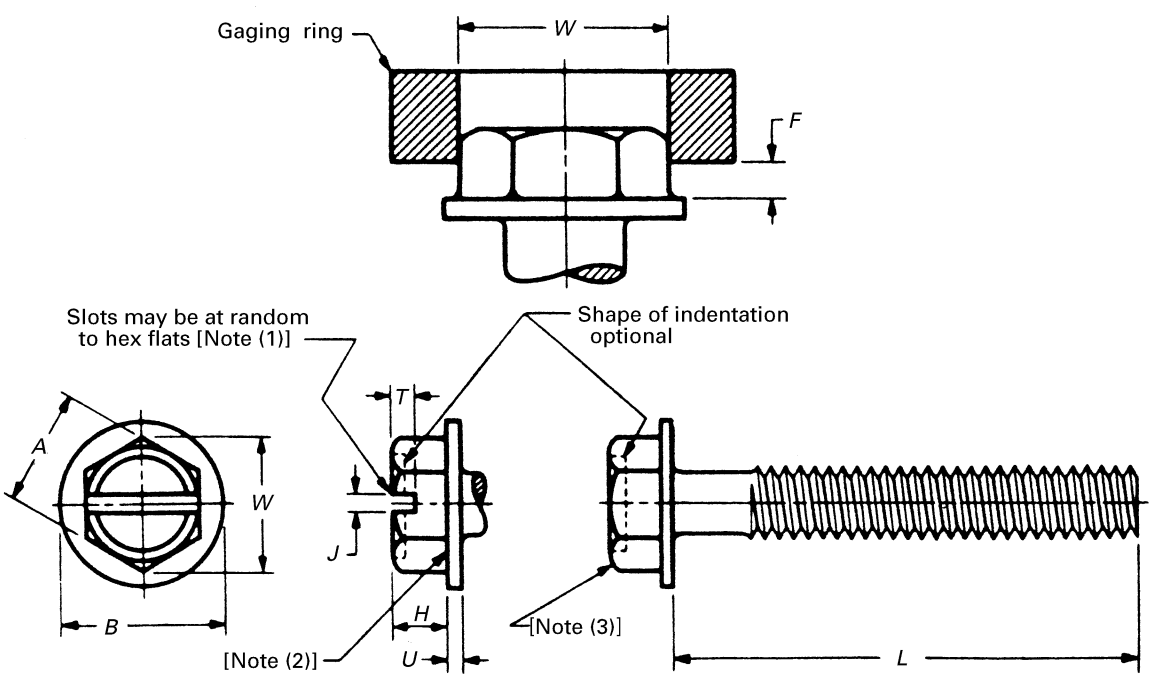


Table 15A Dimensions of Plain and Slotted Hex Washer Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (4)]		Width Across Flats, *A* [Note (5)] Max.	Width Across Flats, *A* [Note (5)] Min.	Width Across Corners, *W*, Min. [Notes (5), (6)]	Head Height, *H* Max.	Head Height, *H* Min.	Washer Diameter, *B* Max.	Washer Diameter, *B* Min.	Washer Thickness, *U* Max.	Washer Thickness, *U* Min.	Slot Width, *J* [Note (1)] Max.	Slot Width, *J* [Note (1)] Min.	Slot Depth, *T* [Notes (1), (7)] Max.	Slot Depth, *T* [Notes (1), (7)] Min.	Protrusion Beyond Gaging Ring, *F*, Min. [Note (6)]
2	0.0860	0.125	0.120	0.134	0.050	0.040	0.166	0.154	0.016	0.010	...	...	...	...	0.024
3	0.0990	0.125	0.120	0.134	0.055	0.044	0.177	0.163	0.016	0.010	...	...	...	...	0.026
4	0.1120	0.188	0.181	0.202	0.060	0.049	0.243	0.225	0.019	0.011	0.039	0.031	0.042	0.025	0.029
5	0.1250	0.188	0.181	0.202	0.070	0.058	0.260	0.240	0.025	0.015	0.043	0.035	0.049	0.030	0.035
6	0.1380	0.250	0.244	0.272	0.093	0.080	0.328	0.302	0.025	0.015	0.048	0.039	0.053	0.033	0.048
8	0.1640	0.250	0.244	0.272	0.110	0.096	0.348	0.322	0.031	0.019	0.054	0.045	0.074	0.052	0.058
10	0.1900	0.312	0.305	0.340	0.120	0.105	0.414	0.384	0.031	0.019	0.060	0.050	0.080	0.057	0.063
12	0.2160	0.312	0.305	0.340	0.155	0.139	0.432	0.398	0.039	0.022	0.067	0.056	0.103	0.077	0.083
1/4	0.2500	0.375	0.367	0.409	0.190	0.172	0.520	0.480	0.050	0.030	0.075	0.064	0.111	0.083	0.103
5/16	0.3125	0.500	0.489	0.545	0.230	0.208	0.676	0.624	0.055	0.035	0.084	0.072	0.134	0.100	0.125
3/8	0.3750	0.562	0.551	0.614	0.295	0.270	0.780	0.720	0.063	0.037	0.094	0.081	0.168	0.131	0.162

GENERAL NOTE: For additional requirements, refer to para. 2.

NOTES:

(1) Unless otherwise specified by purchaser, hex washer head machine screws are not slotted.

(2) Fillet radius *R* at junction of sides of hex and top of washer shall not exceed 0.15 times the basic screw diameter.

(3) A slight rounding of all edges and corners of the hex surfaces shall be permissible.

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

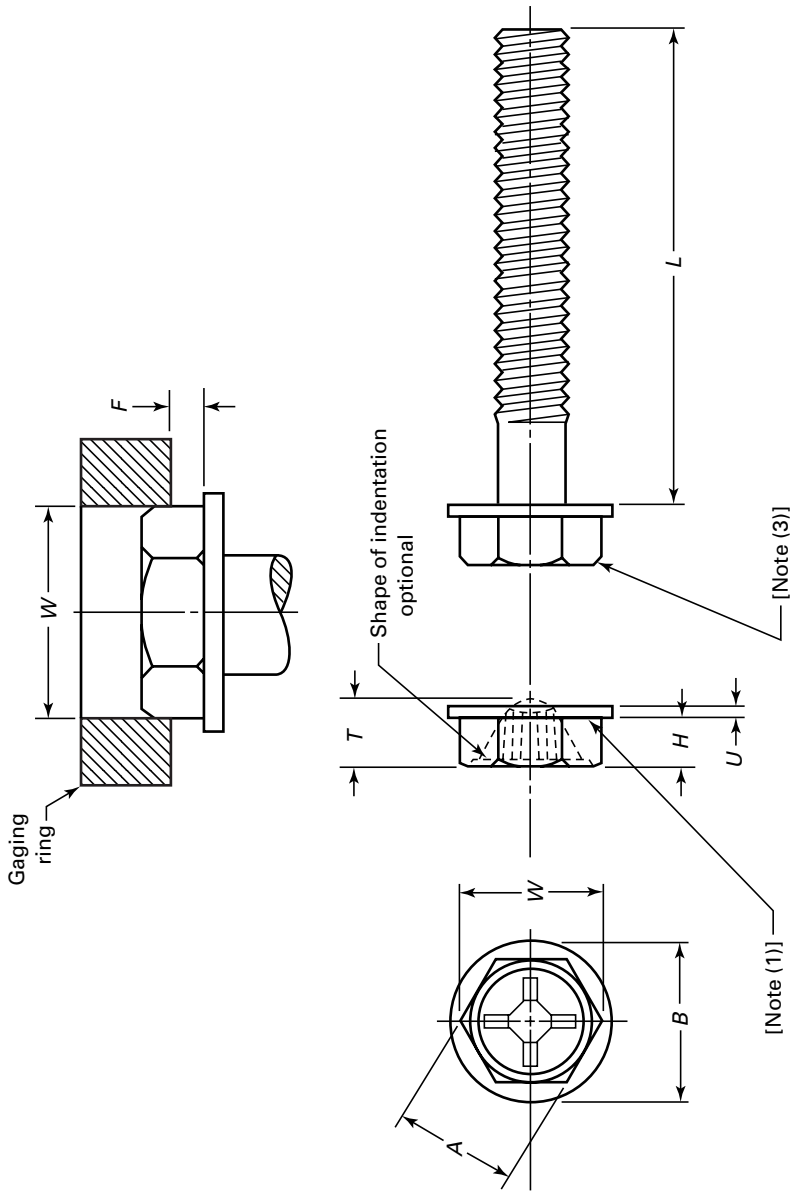
(5) Dimensions across flats and across corners of the head shall be measured at the point of maximum metal. Taper of sides of hex (angle between one side and the axis) shall not exceed 2 deg or 0.004 in. whichever is greater, the specified width across flats being the large dimension.

(6) The rounding due to lack of fill on all six corners of the head shall be reasonably uniform and the width across corners of the head shall be such that when a sharp ring having an inside diameter equal to the specified minimum width across corners is placed on the top of the head, the hex portion of the head shall protrude by an amount equal to, or greater than, the *F* value tabulated. See Appendix II for across corners gaging of hex heads.

(7) Slot depth beyond bottom of indentation shall not be less than one-third of the minimum slot depth specified.

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Table 15B Illustration



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Table 15B Dimensions of Type I Cross Recessed Indented Hex Washer Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (2)]		Width Across Flats, *A* [Note (4)]		Across Corners *W*, Min. [Notes (4), (5)]	Head Height, *H*		Washer Diameter, *B*		Washer Thickness, *U*		Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref. [Note (6)]	Recess Width, *N*, Ref.	Driver Size	Recess Penetration Gaging Depth [Note (6)]		Protrusion Beyond Gaging Ring, *F*, Min. [Note (5)]
		Max.	Min.		Max.	Min.	Max.	Min.	Max.	Min.					Max.	Min.	
4	0.1120	0.188	0.181	0.202	0.060	0.049	0.243	0.225	0.019	0.011	0.097	0.065	0.017	1	0.067	0.049	0.029
5	0.1250	0.188	0.181	0.202	0.070	0.058	0.260	0.240	0.025	0.015	0.105	0.074	0.017	1	0.076	0.058	0.035
6	0.1380	0.250	0.244	0.272	0.093	0.080	0.328	0.302	0.025	0.015	0.148	0.088	0.026	2	0.089	0.064	0.048
8	0.1640	0.250	0.244	0.272	0.110	0.096	0.348	0.322	0.031	0.019	0.168	0.114	0.029	2	0.115	0.090	0.058
10	0.1900	0.312	0.305	0.340	0.120	0.105	0.414	0.384	0.031	0.019	0.178	0.126	0.029	2	0.127	0.102	0.063
12	0.2160	0.312	0.305	0.340	0.155	0.139	0.432	0.398	0.039	0.022	0.247	0.157	0.033	3	0.152	0.127	0.083
1/4	0.2500	0.375	0.367	0.409	0.190	0.172	0.520	0.480	0.050	0.030	0.277	0.191	0.034	3	0.186	0.161	0.103

GENERAL NOTES:

(a) For additional requirements, refer to para. 2.

(b) For reference, see Table 15B Illustration on previous page.

NOTES:

(1) Fillet radius *R* at junction of sides of hex and top of washer shall not exceed 0.15 times the basic screw diameter.

(2) A slight rounding of all edges and corners of the hex surfaces shall be permissible.

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

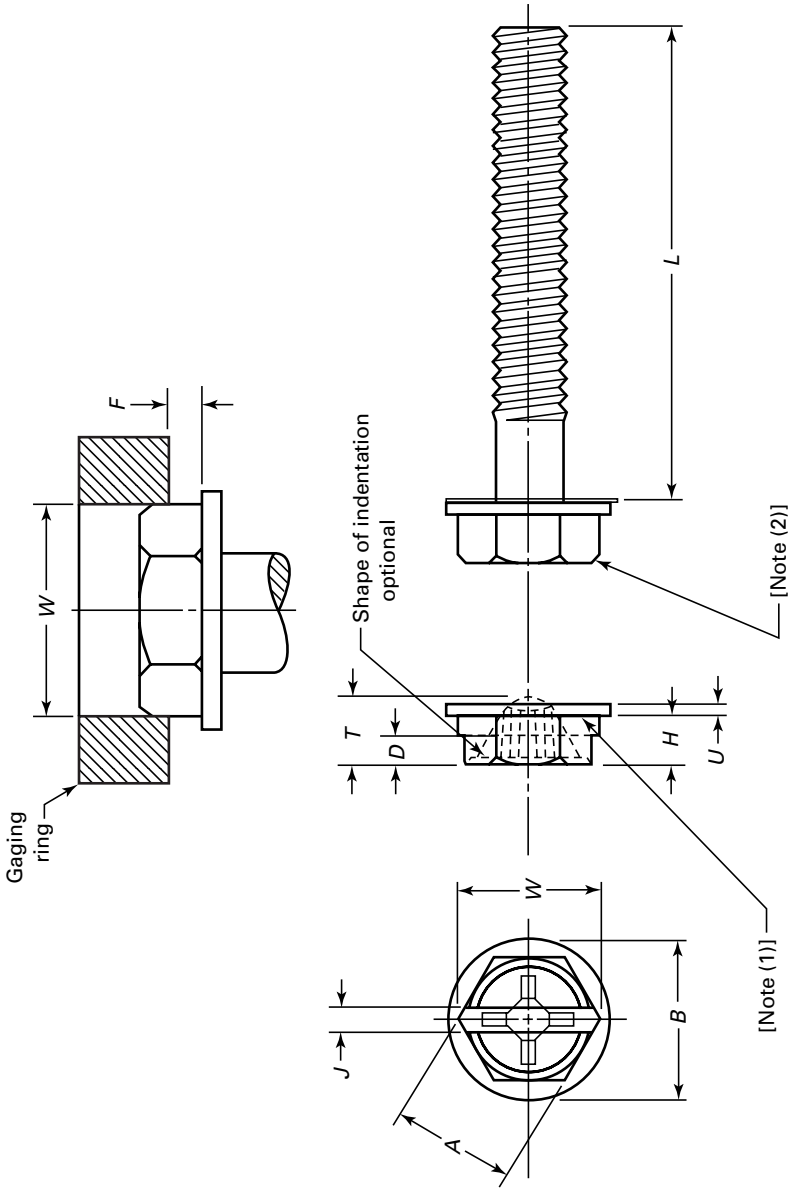
(4) Dimensions across flats and across corners of the head shall be measured at the point of maximum metal. Taper of sides of hex (angle between one side and the axis) shall not exceed 2 deg or 0.004 in., whichever is greater, the specified width across flats being the large dimension.

(5) The rounding due to lack of fill on all six corners of the hex shall be reasonably uniform and the width across corners shall be such that when a sharp ring having an inside diameter equal to the specified minimum width across corners is placed on the top of the head, the head shall protrude by an amount equal to, or greater than, the *F* value tabulated. See Appendix II for across corners gaging of hex heads.

(6) The recess depths and penetrations given are intended to include the depth of the indentation. Due to possible variations in the indentation depths, there could be variations in these dimensions. In these cases, the requirements are to be as agreed upon between the manufacturer and his customer.

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Table 15C Illustration



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Table 15C Dimensions of Combination Slotted — Type I Cross Recessed Indented Hex Washer Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (3)]		Width Across Flats, *A* [Note (4)]		Across Corners *W*, Min. [Notes (4), (5)]	Head Height, *H*		Washer Diameter, *B*		Washer Thickness, *U*		Slot Width, *J*		Slot Depth, *D* [Notes (6), (7)]		Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref. [Note (6)]	Recess Width, *N*, Ref.	Driver Size	Recess Penetration Gaging Depth [Note (6)]		Protrusion Beyond Gaging Ring, *F*, Min. [Note (5)]
		Max.	Min.		Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.					Max.	Min.	
4	0.1120	0.188	0.181	0.202	0.060	0.049	0.243	0.225	0.019	0.011	0.039	0.031	0.042	0.024	0.097	0.065	0.017	1	0.067	0.049	0.029
5	0.1250	0.188	0.181	0.202	0.070	0.058	0.260	0.240	0.025	0.015	0.043	0.035	0.049	0.028	0.105	0.074	0.017	1	0.076	0.058	0.035
6	0.1380	0.250	0.244	0.272	0.093	0.080	0.328	0.302	0.025	0.015	0.048	0.039	0.053	0.030	0.148	0.088	0.026	2	0.089	0.064	0.048
8	0.1640	0.250	0.244	0.272	0.110	0.096	0.348	0.322	0.031	0.019	0.054	0.045	0.074	0.048	0.168	0.114	0.029	2	0.115	0.090	0.058
10	0.1900	0.312	0.305	0.340	0.120	0.105	0.414	0.384	0.031	0.019	0.060	0.050	0.080	0.052	0.178	0.126	0.029	2	0.127	0.102	0.063
12	0.2160	0.312	0.305	0.340	0.155	0.139	0.432	0.398	0.039	0.022	0.067	0.056	0.103	0.072	0.247	0.157	0.033	3	0.152	0.127	0.083
1/4	0.2500	0.375	0.367	0.409	0.190	0.172	0.520	0.480	0.050	0.030	0.075	0.064	0.111	0.078	0.277	0.191	0.034	3	0.186	0.161	0.103

GENERAL NOTES:

(a) For additional requirements, refer to para. 2.

(b) For reference, see Table 15C Illustration on previous page.

NOTES:

(1) Fillet radius *R* at junction of sides of hex and top of washer shall not exceed 0.15 times the basic screw diameter.

(2) A slight rounding of all edges and corners of the hex surfaces shall be permissible.

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

(4) Dimensions across flats and across corners of the head shall be measured at the point of maximum metal. Taper of sides of hex (angle between one side and the axis) shall not exceed 2 deg or 0.004 in., whichever is greater, the specified width across flats being the large dimension.

(5) The rounding due to lack of fill on all six corners of the hex shall be reasonably uniform and the width across corners shall be such that when a sharp ring having an inside diameter equal to the specified minimum width across corners is placed on the top of the head, the head shall protrude by an amount equal to, or greater than, the *F* value tabulated. See Appendix II for across corners gaging of hex heads.

(6) The recess depths, slot depths, and penetrations given are intended to include the depth of the indentation. Due to possible variations in the indentation depths, there could be variations in these dimensions. In these cases, the requirements are to be as agreed upon between the manufacturer and his customer.

(7) The specified minimum slot depths are approximately 10% lower than slotted hex washer heads. That portion of the slot depth that penetrates beyond the bottom of the indentation shall not be less than one third of the minimum slot depth specified.

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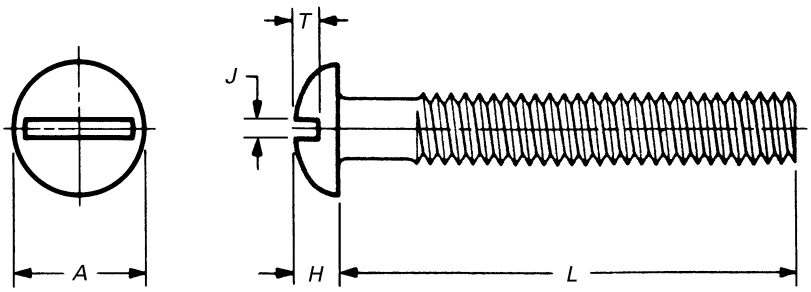


Table 16A Dimensions of Slotted Round Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]		Head Diameter, *A*		Head Height, *H*		Slot Width, *J*		Slot Depth, *T*	
		Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
0000	0.0210	0.041	0.035	0.022	0.016	0.008	0.004	0.017	0.013
000	0.0340	0.062	0.056	0.031	0.025	0.012	0.008	0.018	0.012
00	0.0470	0.089	0.080	0.045	0.036	0.017	0.010	0.026	0.018
0	0.0600	0.113	0.099	0.053	0.043	0.023	0.016	0.039	0.029
1	0.0730	0.138	0.122	0.061	0.051	0.026	0.019	0.044	0.033
2	0.0860	0.162	0.146	0.069	0.059	0.031	0.023	0.048	0.037
3	0.0990	0.187	0.169	0.078	0.067	0.035	0.027	0.053	0.040
4	0.1120	0.211	0.193	0.086	0.075	0.039	0.031	0.058	0.044
5	0.1250	0.236	0.217	0.095	0.083	0.043	0.035	0.063	0.047
6	0.1380	0.260	0.240	0.103	0.091	0.048	0.039	0.068	0.051
8	0.1640	0.309	0.287	0.120	0.107	0.054	0.045	0.077	0.058
10	0.1900	0.359	0.334	0.137	0.123	0.060	0.050	0.087	0.065
12	0.2160	0.408	0.382	0.153	0.139	0.067	0.056	0.096	0.073
1/4	0.2500	0.472	0.443	0.175	0.160	0.075	0.064	0.109	0.082
5/16	0.3125	0.590	0.557	0.216	0.198	0.084	0.072	0.132	0.099
3/8	0.3750	0.708	0.670	0.256	0.237	0.094	0.081	0.155	0.117
7/16	0.4375	0.750	0.707	0.328	0.307	0.094	0.081	0.196	0.148
1/2	0.5000	0.813	0.766	0.355	0.332	0.106	0.091	0.211	0.159
9/16	0.5625	0.938	0.887	0.410	0.385	0.118	0.102	0.242	0.183
5/8	0.6250	1.000	0.944	0.438	0.411	0.133	0.116	0.258	0.195
3/4	0.7500	1.250	1.185	0.547	0.516	0.149	0.131	0.320	0.242

GENERAL NOTES:

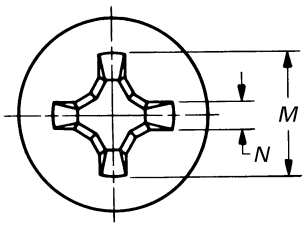
(a) Use of round head screws is not recommended; use pan head screws. See para. 1.2.11 and Table 9A.

(b) For additional requirements, refer to para. 2.

NOTE:

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

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This type of recess has a large center opening, tapered wings, and blunt bottom, with all edges relieved or rounded.

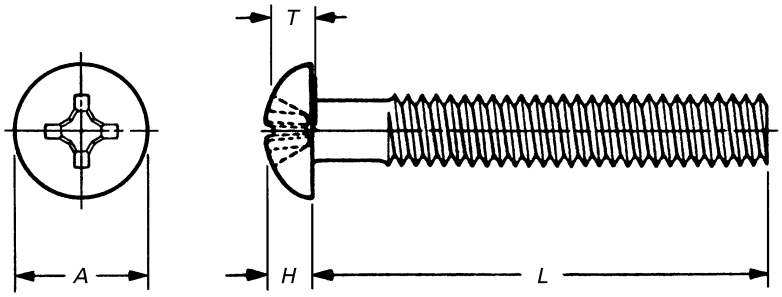


Table 16B Dimensions of Type I Cross Recessed Round Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]		Head Diameter, *A*		Head Height, *H*		Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size	Recess Penetration Gaging Depth	
		Max.	Min.	Max.	Min.					Max.	Min.
0	0.0600	0.113	0.099	0.053	0.043	0.066	0.032	0.014	0	0.035	0.015
1	0.0730	0.138	0.122	0.061	0.051	0.075	0.042	0.015	0	0.045	0.026
2	0.0860	0.162	0.146	0.069	0.059	0.093	0.043	0.017	1	0.046	0.027
3	0.0990	0.187	0.169	0.078	0.067	0.102	0.052	0.018	1	0.055	0.035
4	0.1120	0.211	0.193	0.086	0.075	0.111	0.062	0.019	1	0.065	0.046
5	0.1250	0.236	0.217	0.095	0.083	0.147	0.060	0.027	2	0.063	0.035
6	0.1380	0.260	0.240	0.103	0.091	0.155	0.070	0.027	2	0.073	0.045
8	0.1640	0.309	0.287	0.120	0.107	0.171	0.088	0.030	2	0.090	0.064
10	0.1900	0.359	0.334	0.137	0.123	0.188	0.106	0.031	2	0.108	0.082
12	0.2160	0.408	0.382	0.153	0.139	0.242	0.112	0.032	3	0.108	0.082
1/4	0.2500	0.472	0.443	0.175	0.160	0.261	0.134	0.034	3	0.130	0.104
5/16	0.3125	0.590	0.557	0.216	0.198	0.301	0.174	0.040	3	0.170	0.144
3/8	0.3750	0.708	0.670	0.256	0.237	0.380	0.215	0.064	4	0.208	0.182
7/16	0.4375	0.750	0.707	0.328	0.307	0.395	0.228	0.066	4	0.221	0.196
1/2	0.5000	0.813	0.766	0.355	0.332	0.409	0.243	0.068	4	0.236	0.211
9/16	0.5625	0.938	0.887	0.410	0.385	0.447	0.278	0.075	4	0.272	0.245
5/8	0.6250	1.000	0.944	0.438	0.411	0.542	0.297	0.077	5	0.285	0.244
3/4	0.7500	1.250	1.185	0.547	0.516	0.642	0.398	0.088	5	0.385	0.346

GENERAL NOTES:

(a) Use of round head screws is not recommended; use pan head screws. See para. 1.2.11 and Table 9B.

(b) For additional requirements, refer to para. 2.

NOTE:

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

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This type of recess has a large center opening, tapered wings, and blunt bottom, with all edges relieved or rounded. A slot crosses the head aligned with one pair of wings.

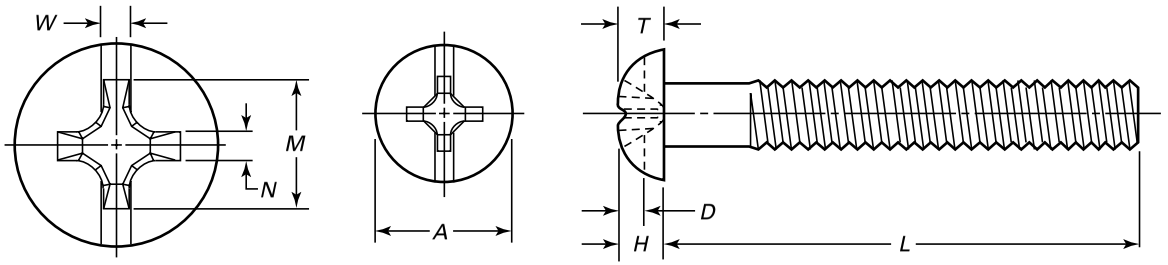


Table 16C Dimensions of Combination Slotted — Type I Cross Recessed Round Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]		Head Diameter, *A*		Head Height, *H*		Slot Width, *N*		Slot Depth, *D* [Note (2)]		Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size	Recess Penetration Gaging Depth	
		Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.					Max.	Min.
0	0.0600	0.113	0.099	0.053	0.043	0.023	0.016	0.039	0.029	0.066	0.032	0.014	0	0.035	0.015
1	0.0730	0.138	0.122	0.061	0.051	0.026	0.019	0.044	0.033	0.075	0.042	0.015	0	0.045	0.026
2	0.0860	0.162	0.146	0.069	0.059	0.031	0.023	0.048	0.037	0.093	0.043	0.017	1	0.046	0.027
3	0.0990	0.187	0.169	0.078	0.067	0.035	0.027	0.053	0.040	0.102	0.052	0.018	1	0.055	0.035
4	0.1120	0.211	0.193	0.086	0.075	0.039	0.031	0.058	0.044	0.111	0.062	0.019	1	0.065	0.046
5	0.1250	0.236	0.217	0.095	0.083	0.043	0.035	0.063	0.047	0.147	0.060	0.027	2	0.063	0.035
6	0.1380	0.260	0.240	0.103	0.091	0.048	0.039	0.068	0.051	0.155	0.070	0.027	2	0.073	0.045
8	0.1640	0.309	0.287	0.120	0.107	0.054	0.045	0.077	0.058	0.171	0.088	0.030	2	0.090	0.064
10	0.1900	0.359	0.334	0.137	0.123	0.060	0.050	0.087	0.065	0.188	0.106	0.031	2	0.108	0.082
12	0.2160	0.408	0.382	0.153	0.139	0.067	0.056	0.096	0.073	0.242	0.112	0.035	3	0.108	0.082
1/4	0.2500	0.472	0.443	0.175	0.160	0.075	0.064	0.109	0.082	0.261	0.134	0.034	3	0.130	0.104
5/16	0.3125	0.590	0.557	0.216	0.198	0.084	0.072	0.132	0.099	0.301	0.174	0.040	3	0.170	0.144
3/8	0.3750	0.708	0.670	0.256	0.237	0.094	0.081	0.155	0.117	0.380	0.215	0.064	4	0.208	0.182
7/16	0.4375	0.750	0.707	0.328	0.307	0.094	0.081	0.196	0.148	0.395	0.228	0.066	4	0.221	0.196
1/2	0.5000	0.813	0.766	0.355	0.332	0.106	0.091	0.211	0.159	0.409	0.243	0.068	4	0.236	0.211
9/16	0.5625	0.938	0.887	0.410	0.385	0.118	0.102	0.242	0.183	0.447	0.278	0.075	4	0.272	0.245
5/8	0.6250	1.000	0.944	0.438	0.411	0.133	0.116	0.258	0.195	0.542	0.297	0.077	5	0.285	0.244
3/4	0.7500	1.250	1.185	0.547	0.516	0.149	0.131	0.320	0.242	0.642	0.398	0.088	5	0.385	0.346

GENERAL NOTES:

(a) Use of round head screws is not recommended; use pan head screws. See para. 1.2.11 and Table 9C.

(b) For additional requirements, refer to para. 2.

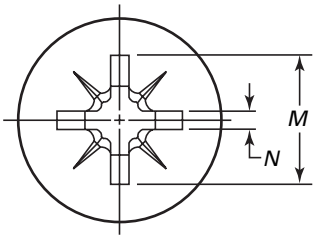
NOTES:

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

(2) Due to the underfill of material caused by the combination recess, the minimum slot depths are approximately 10% lower than slotted round heads.

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This type of recess has a large center opening, wide straight wings, and blunt bottom, with all edges relieved or rounded.



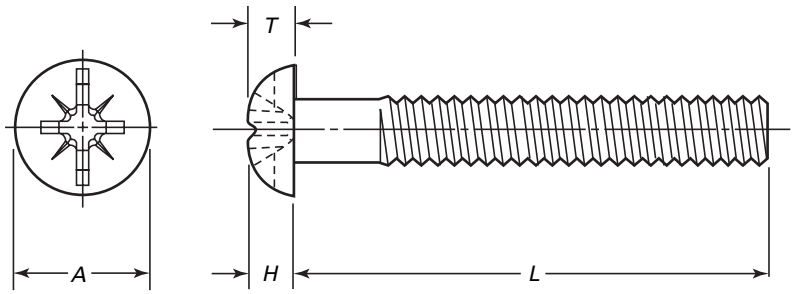


Table 16D Dimensions of Type IA Cross Recessed Round Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]		Head Diameter, *A*		Head Height, *H*		Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size	Recess Penetration Gaging Depth	
		Max.	Min.	Max.	Min.					Max.	Min.
2	0.0860	0.162	0.146	0.069	0.059	0.092	0.050	0.030	1	0.047	0.031
4	0.1120	0.211	0.193	0.086	0.075	0.110	0.070	0.030	1	0.067	0.051
5	0.1250	0.236	0.217	0.095	0.083	0.142	0.066	0.040	2	0.063	0.045
6	0.1380	0.260	0.240	0.103	0.091	0.150	0.074	0.040	2	0.071	0.053
8	0.1640	0.309	0.287	0.120	0.107	0.164	0.089	0.040	2	0.086	0.068
10	0.1900	0.359	0.334	0.137	0.123	0.182	0.105	0.040	2	0.105	0.087
12	0.2160	0.408	0.382	0.153	0.139	0.234	0.114	0.056	3	0.103	0.085
1/4	0.2500	0.472	0.443	0.175	0.160	0.255	0.134	0.056	3	0.126	0.108
5/16	0.3125	0.590	0.557	0.216	0.198	0.291	0.172	0.056	3	0.162	0.144
3/8	0.3750	0.708	0.670	0.256	0.237	0.368	0.223	0.085	4	0.195	0.177

GENERAL NOTES:

(a) Use of round head screws is not recommended; use pan head screws. See para. 1.2.11 and Table 9D.

(b) For additional requirements, refer to para. 2.

NOTE:

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

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This type of recess has a large center opening, wide straight wings, and blunt bottom, with all edges relieved or rounded. A slot crosses the head aligned with one pair of wings.

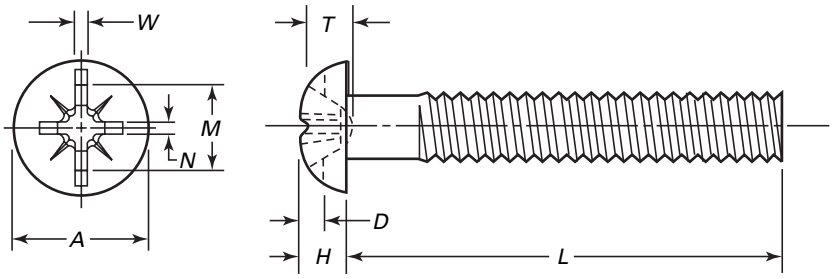


Table 16E Dimensions of Combination Slotted — Type IA Cross Recessed Round Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]		Head Diameter, *A*		Head Height, *H*		Slot Width, *W*		Slot Depth, *D* [Note (2)]		Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size	Recess Penetration Gaging Depth	
		Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.					Max.	Min.
2	0.0860	0.162	0.146	0.069	0.059	0.031	0.023	0.048	0.037	0.092	0.050	0.030	1	0.047	0.031
4	0.1120	0.211	0.193	0.086	0.075	0.039	0.031	0.058	0.044	0.110	0.070	0.030	1	0.067	0.051
5	0.1250	0.236	0.217	0.095	0.083	0.043	0.035	0.063	0.047	0.142	0.066	0.040	2	0.063	0.045
6	0.1380	0.260	0.240	0.103	0.091	0.048	0.039	0.068	0.051	0.150	0.074	0.040	2	0.071	0.053
8	0.1640	0.309	0.287	0.120	0.107	0.054	0.045	0.077	0.058	0.164	0.089	0.040	2	0.086	0.068
10	0.1900	0.359	0.334	0.137	0.123	0.060	0.050	0.087	0.065	0.182	0.105	0.040	2	0.105	0.087
12	0.2160	0.408	0.382	0.153	0.139	0.067	0.056	0.096	0.073	0.234	0.114	0.056	3	0.103	0.085
1/4	0.2500	0.472	0.443	0.175	0.160	0.075	0.064	0.109	0.082	0.255	0.134	0.056	3	0.126	0.108
5/16	0.3125	0.590	0.557	0.216	0.198	0.084	0.072	0.132	0.099	0.291	0.172	0.056	3	0.162	0.144
3/8	0.3750	0.708	0.670	0.256	0.237	0.094	0.081	0.155	0.117	0.368	0.223	0.085	4	0.195	0.177

GENERAL NOTES:

(a) Use of round head screws is not recommended; use pan head screws. See para. 1.2.11 and Table 9E.

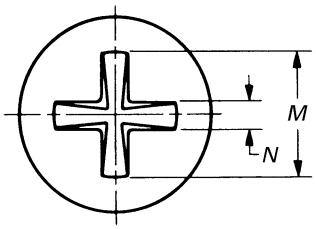
(b) For additional requirements, refer to para. 2.

NOTES:

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

(2) Due to the underfill of material caused by the combination recess, the minimum slot depths are approximately 10% lower than slotted round heads.

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This type of recess consists of two intersecting slots with parallel sides converging to a slightly truncated apex at bottom of recess.

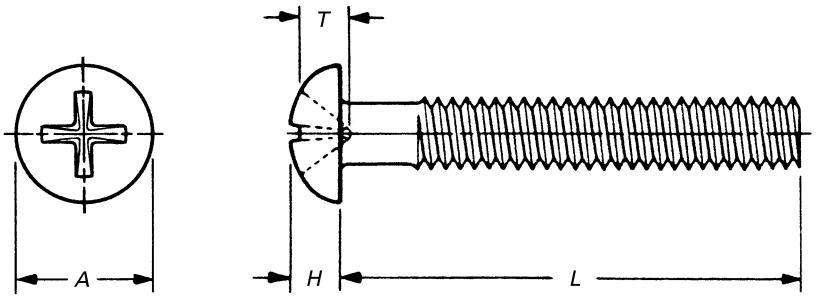


Table 16F Dimensions of Type II Cross Recessed Round Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]	Head Diameter, *A*		Head Height, *H*		Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size [Note (2)]	Recess Penetration Gaging Depth	
	Max.	Min.	Max.	Min.					Max.	Min.
0 0.0600	0.113	0.099	0.053	0.043	0.068	0.030	0.020	. . .	[Note (3)]	[Note (3)]
1 0.0730	0.138	0.122	0.061	0.051	0.084	0.040	0.022	. . .	[Note (3)]	[Note (3)]
2 0.0860	0.162	0.146	0.069	0.059	0.100	0.050	0.025	. . .	0.030	0.020
3 0.0990	0.187	0.169	0.078	0.067	0.116	0.061	0.027	. . .	0.041	0.030
4 0.1120	0.211	0.193	0.086	0.075	0.131	0.070	0.029	. . .	0.051	0.039
5 0.1250	0.236	0.217	0.095	0.083	0.147	0.079	0.032	. . .	0.062	0.050
6 0.1380	0.260	0.240	0.103	0.091	0.162	0.089	0.034	. . .	0.072	0.060
8 0.1640	0.309	0.287	0.120	0.107	0.194	0.110	0.039	. . .	0.093	0.080
10 0.1900	0.359	0.334	0.137	0.123	0.225	0.125	0.043	. . .	0.114	0.099
12 0.2160	0.408	0.382	0.153	0.139	0.256	0.146	0.048	. . .	0.135	0.120
1/4 0.2500	0.472	0.443	0.175	0.160	0.297	0.172	0.054	. . .	0.162	0.146
5/16 0.3125	0.590	0.557	0.216	0.198	0.372	0.213	0.065	. . .	0.212	0.194
3/8 0.3750	0.708	0.670	0.256	0.237	0.447	0.262	0.076	. . .	0.262	0.242
7/16 0.4375	0.750	0.707	0.328	0.307	0.473	0.279	0.080	. . .	0.279	0.258
1/2 0.5000	0.813	0.766	0.355	0.332	0.513	0.304	0.086	. . .	0.306	0.282
9/16 0.5625	0.938	0.887	0.410	0.385	0.593	0.357	0.098	. . .	0.359	0.334
5/8 0.6250	1.000	0.944	0.438	0.411	0.632	0.382	0.103	. . .	0.386	0.358
3/4 0.7500	1.250	1.185	0.547	0.516	0.632	0.382	0.103	. . .	0.386	0.358

GENERAL NOTES:

(a) Use of round head screws is not recommended; use pan head screws. See para. 1.2.11 and Table 9F.

(b) For additional requirements, refer to para. 2.

NOTES:

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

(2) Point same on all drivers.

(3) Not practical to gage.

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This type of recess has a square center opening, slightly tapered side walls, and a conical bottom with top edges relieved or rounded.

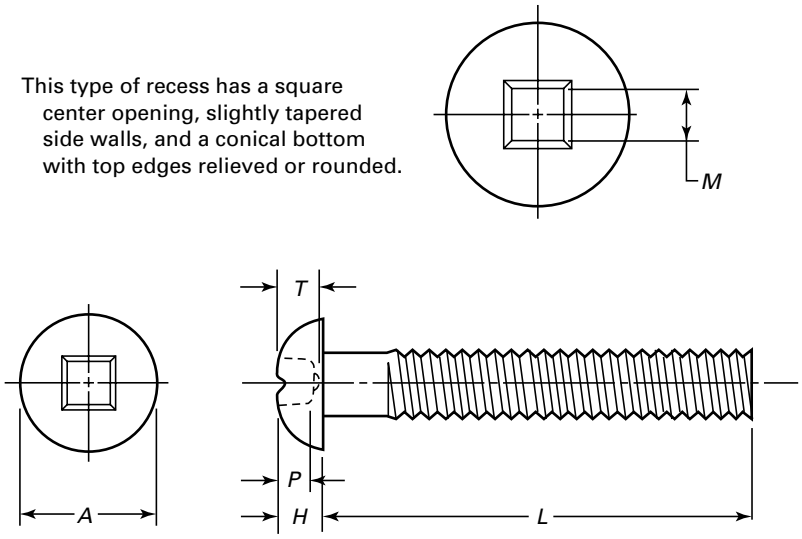


Table 16G Dimensions of Type III Square Recessed Round Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]		Head Diameter, *A*		Head Height, *O*		Recess Across Flats, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Size [Note (2)]	Recess Penetration Gaging Depth [Note (3)]	
		Max.	Min.	Max.	Min.				Max.	Min.
3	0.0990	0.187	0.169	0.078	0.067	0.070	0.066	0	0.038	0.028
4	0.1120	0.211	0.193	0.086	0.075	0.070	0.066	0	0.038	0.028
5	0.1250	0.236	0.217	0.095	0.083	0.091	0.106	1R	0.065	0.050
6	0.1380	0.260	0.240	0.103	0.091	0.091	0.096	1R	0.065	0.050
8	0.1640	0.309	0.287	0.120	0.107	0.112	0.115	2R	0.075	0.060
10	0.1900	0.359	0.334	0.137	0.123	0.112	0.115	2R	0.075	0.060
12	0.2160	0.408	0.382	0.153	0.139	0.133	0.143	3R	0.095	0.080
1/4	0.2500	0.472	0.443	0.175	0.160	0.133	0.143	3R	0.095	0.080
5/16	0.3125	0.590	0.557	0.216	0.198	0.191	0.194	4R	0.100	0.085
3/8	0.3750	0.708	0.670	0.256	0.237	0.191	0.194	4R	0.100	0.085

GENERAL NOTES:

(a) Use of round head screws is not recommended; use pan head screws. See para. 1.2.11 and Table 9G.

(b) For additional requirements, refer to para. 2.

NOTES:

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

(2) "R" in the recess size tabulation means regular depth recess.

(3) Square recesses incorporate a slight taper on the sides of the recess. This taper can result in loss of penetration gaging depth on finished fasteners due to the build up of plating in the recesses. The recess penetration dimensions specified here are for finished (plated) product. Manufacturers should be advised that they should not use all of this tolerance in the heading process, or an out of tolerance condition could exist after plating.

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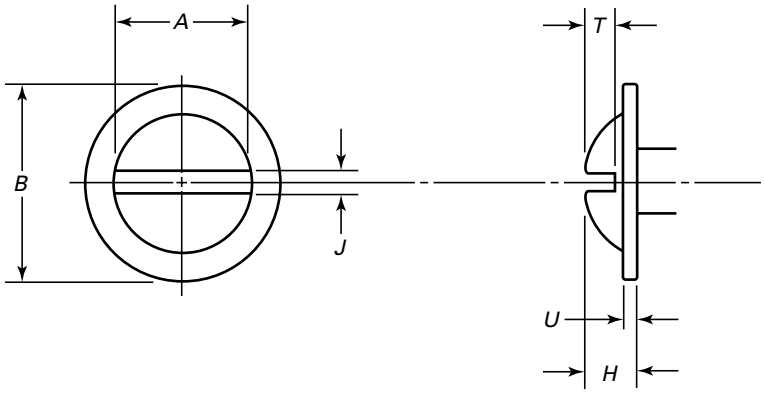


Table 17A Dimensions of Slotted Round Washer Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]	Crown Diameter, *A*, Ref.	Washer Diameter, *B*		Head Height, *H*		Washer Thickness, *U*, Ref.	Slot Width, *J*		Slot Depth, *T*	
		Max.	Min.	Max.	Min.		Max.	Min.	Max.	Min.
4 0.1120	0.177	0.261	0.243	0.079	0.067	0.030	0.039	0.031	0.048	0.038
5 0.1250	0.198	0.291	0.272	0.088	0.075	0.040	0.043	0.035	0.053	0.041
6 0.1380	0.218	0.321	0.301	0.096	0.084	0.040	0.048	0.039	0.058	0.043
8 0.1640	0.259	0.380	0.358	0.113	0.101	0.040	0.054	0.045	0.067	0.051
10 0.1900	0.300	0.439	0.416	0.130	0.118	0.050	0.060	0.050	0.071	0.055
12 0.2160	0.341	0.498	0.473	0.148	0.134	0.050	0.067	0.056	0.085	0.067
1/4 0.2500	0.395	0.576	0.548	0.170	0.157	0.050	0.075	0.064	0.098	0.083

GENERAL NOTE: For additional requirements, refer to para. 2.

NOTE:

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

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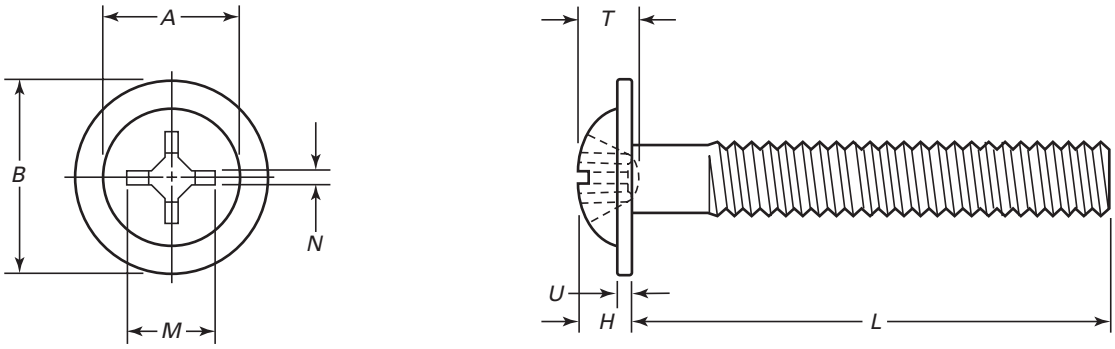


Table 17B Dimensions of Type I Cross Recessed Round Washer Head Machine Screws

Nominal Size or Basic Screw Diameter [Note (1)]	Crown Diameter, *A*, Ref.	Head Height, *H*		Washer Diameter, *B*		Washer Thickness, *U*, Ref.	Recess Diameter, *M*, Ref.	Recess Depth, *T*, Ref.	Recess Width, *N*, Ref.	Driver Size	Recess Penetration Gaging Depth	
		Max.	Min.	Max.	Min.						Max.	Min.
2 0.0860	0.136	0.062	0.050	0.202	0.186	0.030	0.099	0.041	0.018	1	0.046	0.021
3 0.0990	0.156	0.070	0.058	0.232	0.215	0.030	0.107	0.052	0.019	1	0.056	0.033
4 0.1120	0.177	0.079	0.067	0.261	0.243	0.030	0.116	0.062	0.019	1	0.065	0.044
5 0.1250	0.198	0.088	0.075	0.291	0.272	0.040	0.139	0.052	0.026	2	0.054	0.026
6 0.1380	0.218	0.096	0.084	0.321	0.301	0.040	0.147	0.058	0.026	2	0.061	0.033
8 0.1640	0.259	0.113	0.101	0.380	0.358	0.040	0.161	0.073	0.028	2	0.076	0.048
10 0.1900	0.300	0.130	0.118	0.439	0.416	0.050	0.177	0.091	0.029	2	0.093	0.066
12 0.2160	0.341	0.148	0.134	0.498	0.473	0.050	0.228	0.097	0.030	3	0.094	0.066
1/4 0.2500	0.396	0.170	0.157	0.576	0.548	0.050	0.244	0.110	0.032	3	0.107	0.080
5/16 0.3125	0.494	0.211	0.197	0.719	0.687	0.060	0.292	0.160	0.038	3	0.156	0.129
3/8 0.3750	0.593	0.253	0.238	0.861	0.825	0.060	0.348	0.177	0.058	4	0.170	0.144
7/16 0.4375	0.691	0.294	0.278	1.004	0.963	0.070	0.366	0.198	0.061	4	0.190	0.165
1/2 0.5000	0.790	0.335	0.319	1.146	1.101	0.090	0.383	0.217	0.063	4	0.210	0.184

GENERAL NOTE: For additional requirements, refer to para. 2.

NOTE:

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

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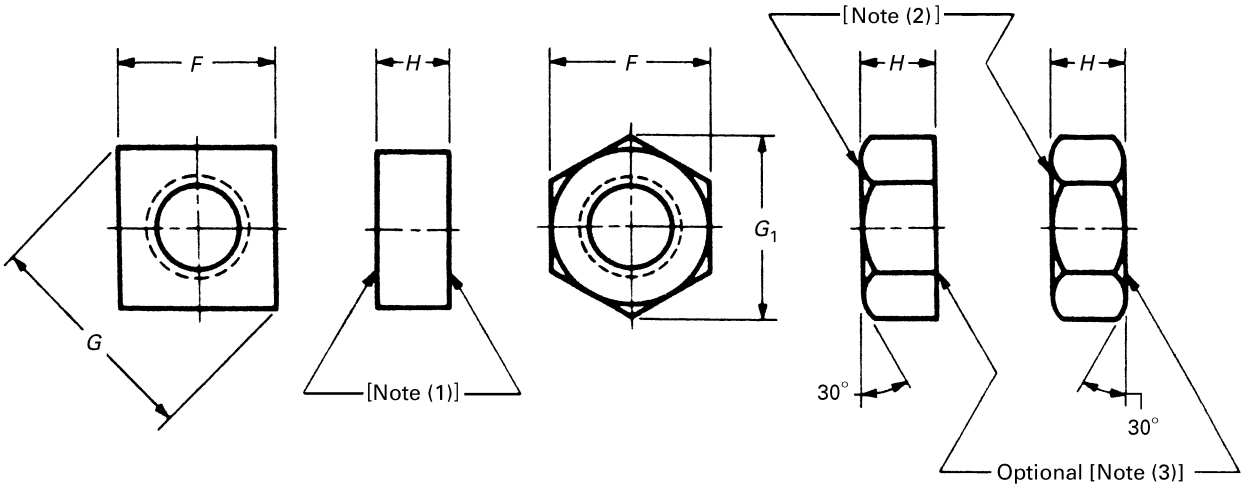


Table 18 Dimensions of Square and Hex Machine Screw Nuts

Nominal Size or Basic Thread Diameter [Note (4)]		Width Across Flats, *F*			Width Across Corners				Thickness, *H*	
					Square, *G*		Hex, G_1			
		Basic	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
0	0.0600	5/32	0.156	0.150	0.221	0.206	0.180	0.171	0.050	0.043
1	0.0730	5/32	0.156	0.150	0.221	0.206	0.180	0.171	0.050	0.043
2	0.0860	3/16	0.188	0.180	0.265	0.247	0.217	0.205	0.066	0.057
3	0.0990	3/16	0.188	0.180	0.265	0.247	0.217	0.205	0.066	0.057
4	0.1120	1/4	0.250	0.241	0.354	0.331	0.289	0.275	0.098	0.087
5	0.1250	5/16	0.312	0.302	0.442	0.415	0.361	0.344	0.114	0.102
6	0.1380	5/16	0.312	0.302	0.442	0.415	0.361	0.344	0.114	0.102
8	0.1640	11/32	0.344	0.332	0.486	0.456	0.397	0.378	0.130	0.117
10	0.1900	3/8	0.375	0.362	0.530	0.497	0.433	0.413	0.130	0.117
12	0.2160	7/16	0.438	0.423	0.619	0.581	0.505	0.482	0.161	0.148
1/4	0.2500	7/16	0.438	0.423	0.619	0.581	0.505	0.482	0.193	0.178
5/16	0.3125	9/16	0.562	0.545	0.795	0.748	0.650	0.621	0.225	0.208
3/8	0.3750	5/8	0.625	0.607	0.884	0.833	0.722	0.692	0.257	0.239

GENERAL NOTE: For additional requirements, refer to para. 2.

NOTES:

(1) Square machine screw nuts shall have tops and bottoms flat, and un-chamfered. The flat surfaces shall be perpendicular to the axis of the threaded hole pitch cylinder within a tolerance of 4 deg.

(2) Hexagon machine screw nuts shall have top and bottom surfaces flat, with chamfered corners. The flat surface diameters shall be equal to the maximum width across flats, with a tolerance of minus 15%. The bearing surface shall be perpendicular to the axis of the threaded hole pitch cylinder within a tolerance of 4 deg.

(3) Bottoms of hexagon machine screw nuts may be supplied with flat, but un-chamfered surfaces at the option of the manufacturer.

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

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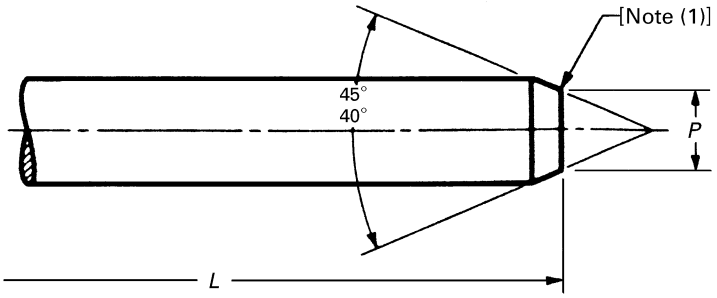


Table 19 Dimensions of Header Points for Machine Screws Before Threading

Nominal Size or Basic Screw Diameter [Note (2)]		Threads per Inch	Point Diameter, *P*		Nominal Screw Length, *L*, Max. [Note (3)]
			Max.	Min.	
2	0.0860	56	0.057	0.050	1/2
		64	0.060	0.053	1/2
4	0.1120	40	0.074	0.065	1/2
		48	0.079	0.070	1/2
5	0.1250	40	0.086	0.076	1/2
		44	0.088	0.079	1/2
6	0.1380	32	0.090	0.080	3/4
		40	0.098	0.087	3/4
8	0.1640	32	0.114	0.102	1
		36	0.118	0.106	1
10	0.1900	24	0.125	0.112	1 1/4
		32	0.138	0.124	1 1/4
12	0.2160	24	0.149	0.134	1 3/8
		28	0.156	0.141	1 3/8
1/4	0.2500	20	0.170	0.153	1 1/2
		28	0.187	0.169	1 1/2
5/16	0.3125	18	0.221	0.200	1 1/2
		24	0.237	0.215	1 1/2
3/8	0.3750	16	0.270	0.244	1 1/2
		24	0.295	0.267	1 1/2
7/16	0.4375	14	0.316	0.287	1 1/2
		20	0.342	0.310	1 1/2
1/2	0.5000	13	0.367	0.333	1 1/2
		20	0.399	0.362	1 1/2

GENERAL NOTE: For aditional requirements, refer to para. 2.

NOTES:

(1) Edges of point may be rounded and end of point need not be flat nor perpendicular to axis of shank.

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

(3) Header points apply to these nominal lengths or shorter. The pointing of longer lengths may require machining to the dimensions specified.

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MANDATORY APPENDIX I
PROTRUSION GAGING OF FLAT COUNTERSUNK HEADS

Suitability of flat countersunk head screws, except the No. 0000, No. 000, and No. 00 sizes, and undercut flat countersunk head screws, except the No. 0 and No. 1 sizes, for application in countersinks designed to the principal dimensions of the screws may be determined by the use of a protrusion gage as illustrated in Fig. I-1.

The gaging dimensions and the gage diameters are specified in the dimensional tables for flat countersunk head and undercut flat countersunk head screws. The protrusion limits shown in the tables shall apply only when the gaging diameter is exactly as indicated with the gaging edge of a sharpness obtained by lapping the hole and the top surface of the gage. Any variation in the gaging diameter will require recalculation of protrusion values by the original formulas given below:

Maximum protrusion:[1,2]

$$\text{Max. } F = \frac{\text{Max. sharp head diameter} - \text{gage hole diameter}}{2} \times \tan\left(90^\circ - \frac{\text{Min. head angle}}{2}\right)$$

[1] Protrusion values shown in dimensional tables were calculated from these formulas and rounded to the nearest 0.001 in., upward for the maximum and downward for the minimum.

[2] See formulas for maximum and minimum sharp head diameters in Appendix V.

Minimum protrusion:[1,2]

$$\text{Min. } F = \frac{\text{Min. sharp head diameter} - \text{gage hole diamter}}{2} \times \tan\left(90^\circ - \frac{\text{Max. head angle}}{2}\right)$$

or correction of protrusion in accordance with the following formula:

$$F' = F\,\frac{A - G'}{A - G}$$

where

F = tabulated protrusion value
F' = corrected protrusion value
A = head diameter (maximum or minimum for maximum or minimum protrusion, respectively)
G = tabulated gage diameter
G' = measured gage diameter

To ensure adequate service life, the protrusion gage should be made of tool steel having a hardness of not less than 60 Rockwell C (60 HRC).

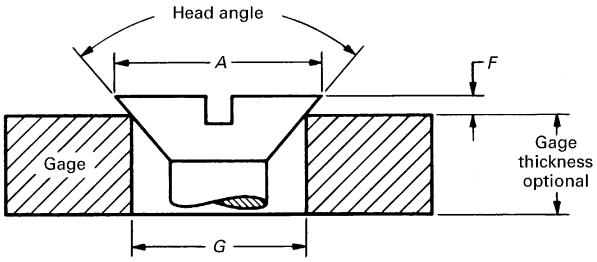


Fig. I-1 Protusion Gage

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MANDATORY APPENDIX II
ACROSS-CORNERS GAGING OF HEX HEADS

Suitability of across-corners dimensions of hex head and hex washer head screws may be determined by the use of gaging rings as described below.

When the gaging ring is placed on the top of a hex or hex washer head screw, and also the bottom of a hex head screw, at right angles to the axis of the screw, the head (hex portion of washer head) must protrude beyond the ring by an amount equal to 60% of the minimum head height *H*. For convenience, the minimum protrusion values are given in the dimensional tables for hex and hex washer head screws.

The gaging ring shall have an inside diameter equal to the tabulated minimum width across-corners, within a tolerance of plus 0.0003 in. The gaging edges of the ring shall be sharp and opposite faces shall be parallel. To insure adequate service life, the ring should be made of tool steel and have a hardness of not less than 60 Rockwell C.

A typical gaging fixture is shown in Fig. II-1 with an explanation of its application; however, any equivalent means may be used.

To check hex head screws from the top, an initial reading shall be taken with the gaging ring placed on the indexing plate. Then, with the screw placed in the fixture, the gaging ring shall be placed on top of the screw head and a second reading taken. The difference between the two readings is equal to the protrusion *F* of the head beyond the gaging ring.

To check hex washer head screws, the gaging procedure shall be exactly the same as that for checking hex head screws from the top. However, in this case the difference *X* between the two readings includes the washer thickness and it is necessary to deduct the actual (measured) thickness of the washer portion from the difference *X* to obtain the protrusion *F* of the hex beyond the gaging ring.

Gaging the bottom of the head on hex head screws may be accomplished in the same manner as gaging the top, except the ring is placed below the head. The same protrusion values shall apply.

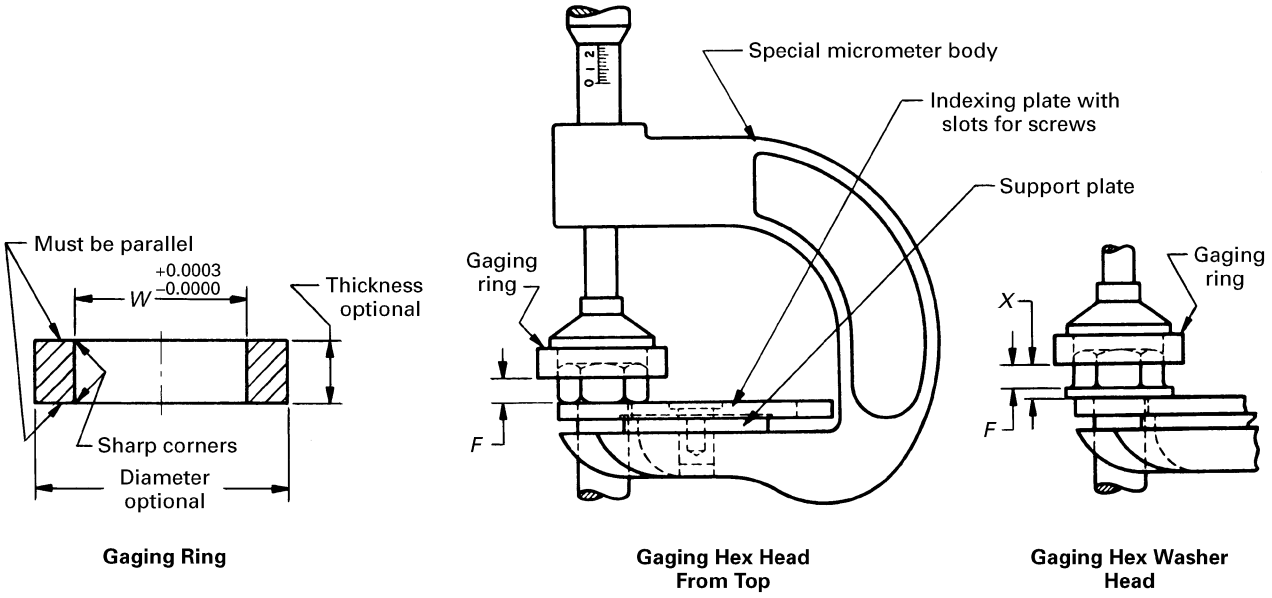


Fig. II-1 Typical Gaging Fixture

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MANDATORY APPENDIX III
GAGING OF RECESSED HEADS

III-I PENETRATION GAGING

Penetration gaging is a test to determine the suitability of recesses in the heads of screws and may be used to indicate deficiencies in the dimensional aspects of the recesses specified in the dimensional tables. (Refer to Figs. III-1, III-2, III-3, and III-4 for illustrations of penetration gages for Types I, IA, II, and III recesses, respectively.) Penetrations that are too deep indicate the possibility of a thin section between head and shank of screw, a weakness that might result in twisting-off screw heads during tightening of the screws. Screws with shallow penetration might result in production problems such as reaming of recess or excessive wear on driver bits.

Penetration gaging depth values for the various styles of recessed heads are included in the dimensional tables for the respective heads. These values were predicated originally on the gaging of plain finish (unplated or uncoated) screws. However, subsequent experience has shown that the Type I and Type II recess penetration limits as tabulated, and the Type IA and Type III recess penetration depths with the tabulated minimum limit reduced by up to 0.005 in., are suitable for the gaging of screws having coating thickness of up to and including 0.0003 in., on significant surfaces.

This allowance makes up for the loss of depth brought about by the plating buildup on the sides of the recess.

Screws having heavier coatings, which fail to meet minimum penetration, must be stripped of finish and gaged for acceptance or rejection in the plain condition.

Specified in Tables III-1 through III-4 are dimensions of gage points to be used for penetration gaging the Type I, Type IA, Type II, and Type III recesses. These gage points approach as nearly as possible the perfect driver form. Also specified are gage heads and bushings, which adapt the gage points to standard dial gages.

Penetration depths for Types I, IA, and II recesses are gaged relative to a reference plane defined by the intersection of the edge of the recess wings with the top surface of the screw head. This plane is the same as the top surface on flat head screws, but is somewhat below the topmost point on heads with rounded top surfaces. Knife edges or tapered ridges on the gage head are used to establish the reference plane.

Penetration depths for Type III recesses are gaged relative to a reference plane defined by the intersection of the edge of the recess square with the top surface of the screw head. This plane is the same as the top surface on flat head screws, but may be somewhat below the topmost point on heads with rounded top surfaces.

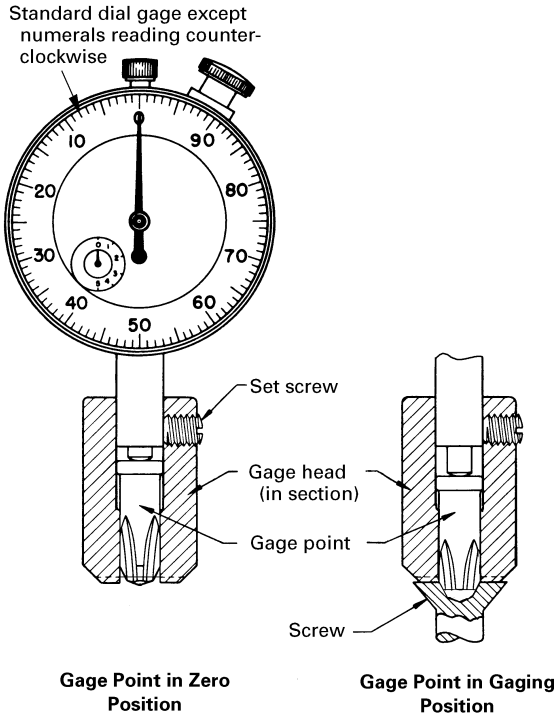


Fig. III-1 Penetration Gage for Type I Recess

A reverse reading indicator is used to determine the penetration of the gage point into the recess. The gage may be zeroed on any flat surface.

III-2 FIT GAGING ON TYPE III RECESSES

In addition to the penetration gage, a "Fit" gage is also required for Type III recesses. Fit gage points are dimensioned in Table III-8. Fit is gaged by the insertion of the gage point into the recess, and a determination made as to how well the gage seats into the recess. The gage should produce a very tight fit with the recess. This is sometimes referred to a "stick fit." A lack of this tight fit may indicate a problem with the shape of the recess.

the fit gage and the penetration gage combine to effectively determine the suitability of the Type III recess.

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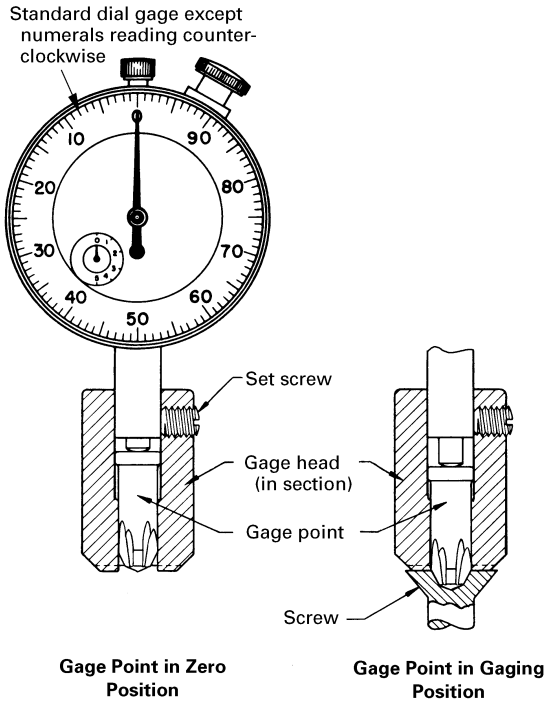


Fig. III-2 Penetration Gage for Type IA Recess

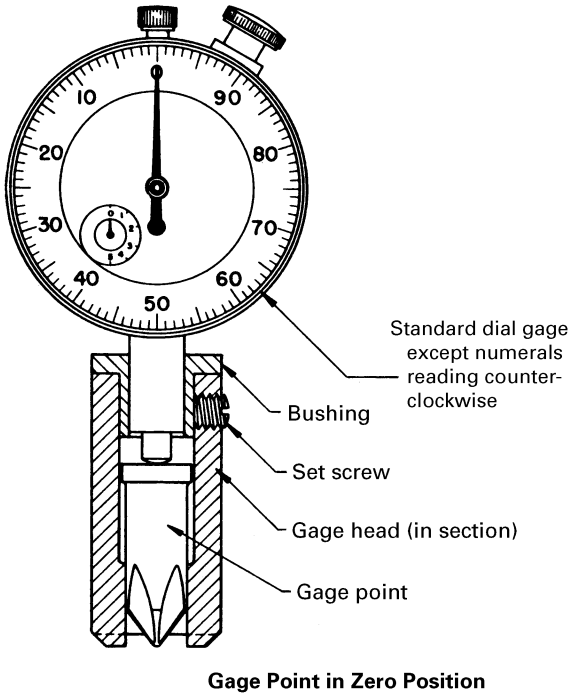


Fig. III-3 Penetration Gage for Type II Recess

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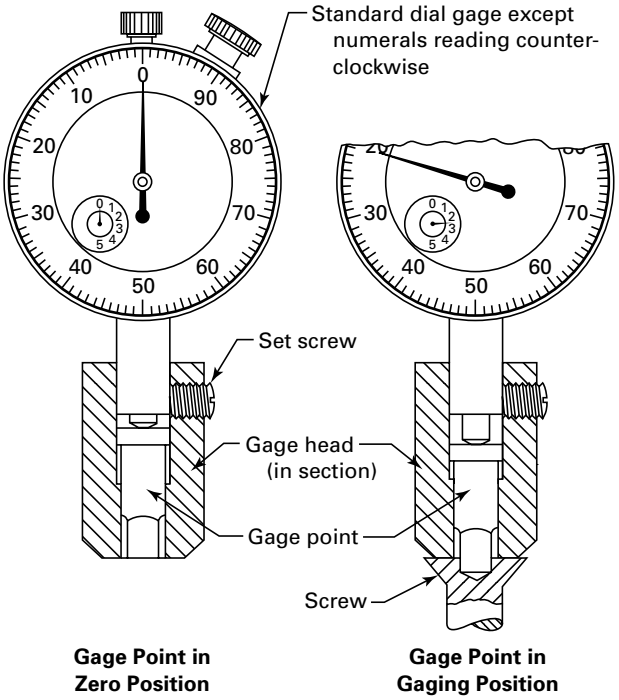


Fig. III-4 Penetration Gage for Type III Recess

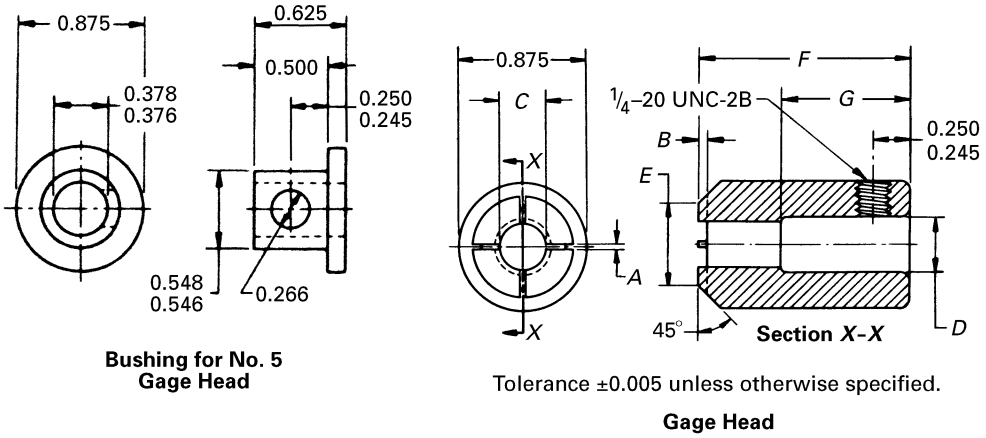
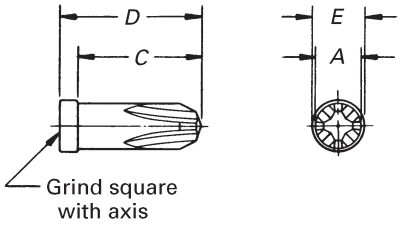


Table III-1 Dimensions of Gage Heads for Type I and IA Recesses

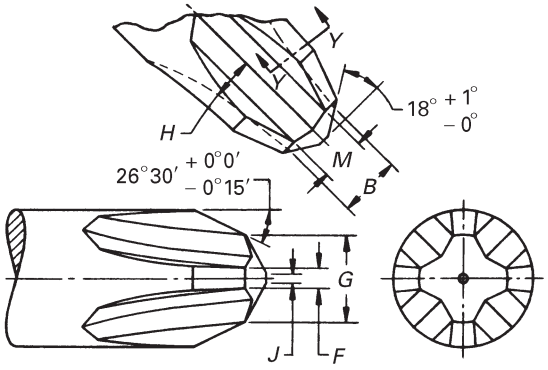
Size of Recess Gage	*A*, (±0.002)	*B*, (±0.003)	*C*, (±0.0002)	*D*, (±0.001)	*E*, (±0.005)	*F*, (±0.005)	*G*, (±0.005)
No. 0	0.008	0.015	0.0460	0.377	0.562	1.688	1.126
No. 1	0.012	0.020	0.0880	0.377	0.562	1.688	1.126
No. 2	0.018	0.031	0.1420	0.377	0.562	1.688	1.126
No. 3	0.022	0.037	0.2100	0.377	0.562	1.688	1.126
No. 4	0.031	0.062	0.3130	0.377	0.562	1.688	1.126
No. 5	0.041	0.094	0.5010	0.550	0.750	1.896	1.134

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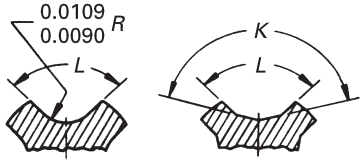
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Gage Point



Enlarged Point Detail



Half Section *Y-Y*

Table III-2 Dimensions of Gage Points for Type I Recess

Size of Recess Gage	Point Diameter, *A*, (±0.0002)	Point, Width *B*, (+0.0000 −0.0010)	Length, *C*, (±0.005)	Length, *D*, (±0.005)	Diameter, *E*, (±0.005)	Wing Thickness, *F*		Point Width, *G*, (+0.0010 −0.0000)	Milling Angle, *H*, (0° +00′ 0° −15′)	Flat on End, *J*		Base Flute Angle, *K*, (0° +15′ 0° −00′)	Side Flute Angle, *L*, (0° +15′ 0° −00′)	Flute Width at Bottom, *M*, (+0.0000 −0.0010)
						Max.	Min.			Max.	Min.			
No. 0	0.0450	0.0240	0.656	0.781	0.094	0.012	0.010	0.0320	7° 00′	0.015	0.010	[Note (1)]	92° 00′	0.0151 [Note (2)]
No. 1	0.0870	0.0394	0.688	0.812	0.156	0.020	0.018	0.0500	7° 00′	0.020	0.015	138° 00′	92° 00′	0.0202
No. 2	0.1410	0.0606	0.750	0.875	0.219	0.025	0.023	0.0900	5° 45′	0.020	0.015	140° 00′	92° 00′	0.0434
No. 3	0.2090	0.0983	0.781	0.906	0.250	0.031	0.029	0.1500	5° 45′	0.020	0.015	146° 00′	92° 00′	0.0826
No. 4	0.3120	0.1407	0.844	0.969	0.359	0.044	0.042	0.2000	7° 00′	0.020	0.015	153° 00′	92° 00′	0.1078
No. 5	0.5000	0.2310	1.031	1.156	0.531	0.063	0.061	0.3110	7° 00′	0.025	0.020	162° 46′	92° 00′	0.1730

GENERAL NOTE: For additional reference, see Table III-1 Illustration on previous page.

NOTES:

(1) Base of flute on size No. 0 has 0.0090 to 0.0109 in. radius.

(2) Tolerance on size No. 0 is plus 0.0000 and minus 0.0026 in.

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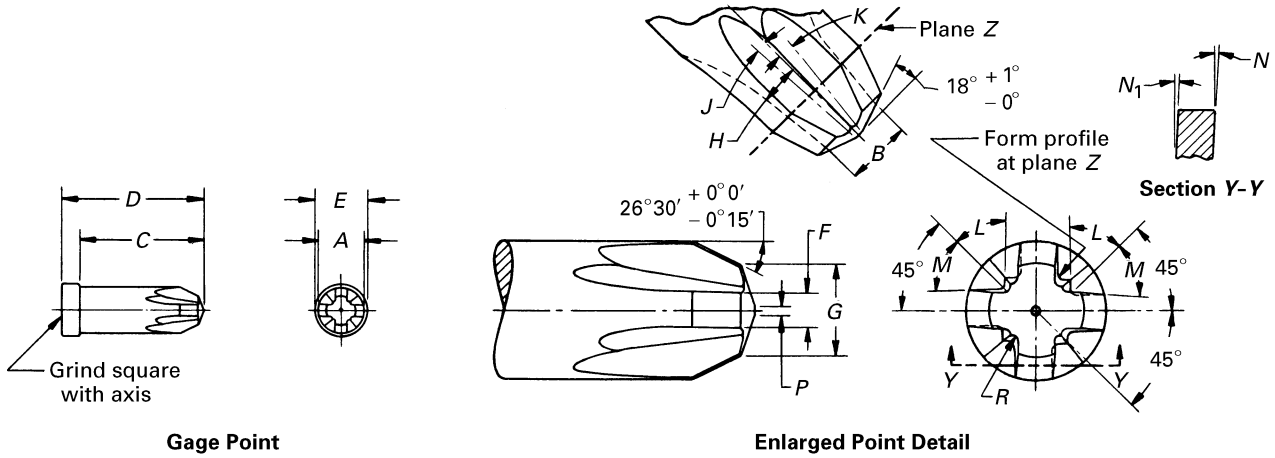


Table III-3 Dimensions of Gage Points for Type IA Recess

Size of Recess Gage	Point Diameter, *A*, (±0.0002)	Point Width, *B* (at Base of Radius, *R*) Max.	Point Width, *B* (at Base of Radius, *R*) Min.	Length, *C*, (±0.005)	Length, *D*, (±0.005)	Diameter, *E*, (±0.005)	Wing Thickness, *F*, (+0.0010 −0.0000)	Point Width *G*, (+0.001 −0.000)
No. 0	0.0450	0.0280	0.0265	0.656	0.781	0.094	0.0165	0.035
No. 1	0.0870	0.0438	0.0423	0.688	0.812	0.156	0.0265	0.054
No. 2	0.1410	0.0670	0.0655	0.750	0.875	0.219	0.0380	0.095
No. 3	0.2090	0.1020	0.1005	0.781	0.906	0.250	0.0530	0.155
No. 4	0.3120	0.1520	0.1505	0.844	0.969	0.359	0.0810	0.203
No. 5	0.5000	0.2420	0.2400	1.031	1.156	0.531	0.0910	0.315

Size of Recess Gage	Milling Angle, *H*, (0° +00′ 0° −06′)	Milling Offset Angle, *J*, (0° +06′ 0° −00′)	Milling Offset Angle, *K*, (0° +06′ 0° −00′)	Rib Form Angle, *L*, (0° +07′ 0° −00′) [Note (1)]	Wing Form Angle, *M*, (0° +07′ 0° −00′) [Note (1)]	Wing Offset Angle, *N*	Wing Offset Angle, N_1	Flat on End, *P*, (+0.005 −0.000)	Radius, *R* Max.	Radius, *R* Min.
No. 0	7° 00′	4° 23′	7° 45′	46° 00′	46° 00′	22′	2° 00′	0.010	0.004	0.003
No. 1	7° 00′	4° 23′	7° 45′	46° 00′	46° 00′	22′	2° 00′	0.015	0.005	0.004
No. 2	5° 45′	3° 00′	6° 20′	46° 00′	46° 00′	17′	2° 04′	0.015	0.008	0.006
No. 3	5° 45′	3° 00′	6° 20′	56° 15′	46° 00′	17′	2° 04′	0.015	0.012	0.008
No. 4	7° 00′	4° 23′	7° 45′	56° 15′	46° 00′	22′	2° 00′	0.015	0.020	0.014
No. 5	7° 00′	4° 23′	7° 45′	56° 15′	46° 00′	22′	2° 00′	0.020	0.040	0.035

NOTE:
(1) These dimensions are measured normal to the milling cut.

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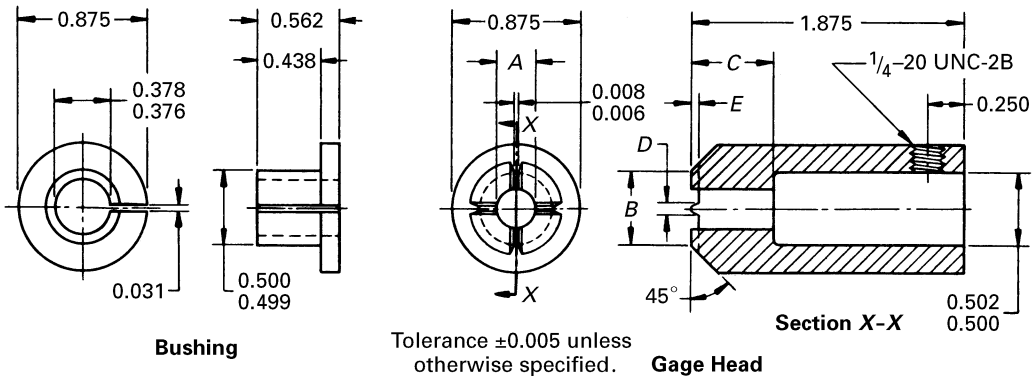


Table III-4 Dimensions of Gage Heads for Type II Recess

Gage Diameter	*A*, (±0.0001)	*B*, (±0.005)	*C*, (±0.005)	*D*, (+0.002 −0.000)	*E*, (+0.002 −0.000)
0.093	0.0930	0.344	0.375	0.030	0.024
0.141	0.1410	0.375	0.438	0.046	0.036
0.246	0.2460	0.500	0.500	0.062	0.051
0.436	0.4360	0.688	0.562	0.094	0.078

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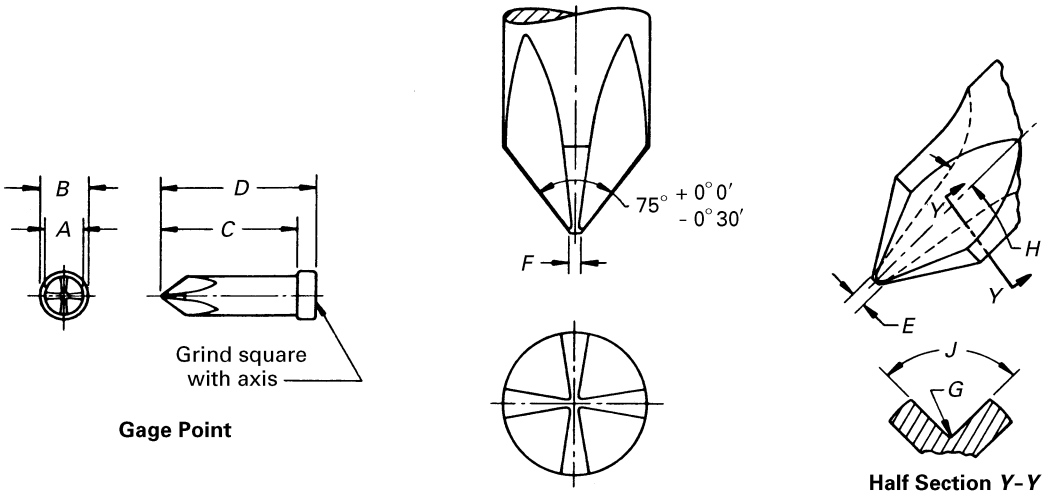


Table III-5 Dimensions of Gage Points for Type II Recess

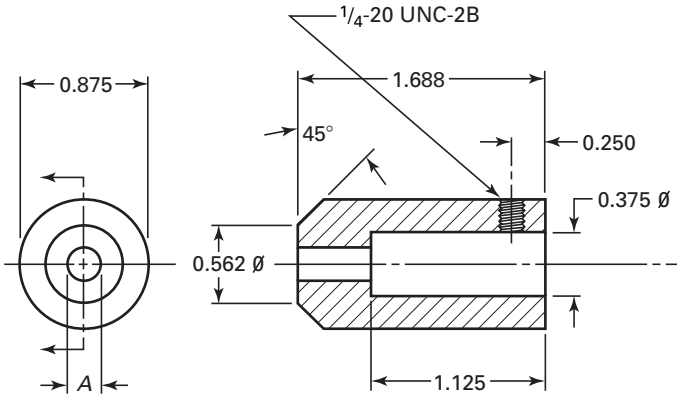
Gage Diameter	Point Diameter, *A*, (±0.0001)	Diameter, *B*, (±0.005)	Length, *C*, (±0.005)	Length, *D*, (±0.005)	Point Width, *E*, (+0.001 −0.000)	Flat on End, *F*, (±0.002)	Radius, *G*, (+0.000 −0.001)	Milling Angle, *H*, (0° +05′ 0° −00′)	Side Flute Angle, *J*, (0° +15′ 0° −00′)
0.093	0.0926	0.188	0.750	0.875	0.027	0.062	0.005	8° 45′	90° 00′
0.141	0.1406	0.250	0.875	1.000	0.027	0.062	0.005	8° 45′	90° 00′
0.246	0.2456	0.312	0.938	1.062	0.027	0.062	0.005	8° 45′	90° 00′
0.436	0.4356	0.469	1.125	1.250	0.027	0.062	0.005	8° 45′	90° 00′

GENERAL NOTES:

(a) Although these gages may be used interchangeably, showing identical readings on those sizes of screws where dimension *B* of gage head is greater than the recess diameter, the following recommendations may be applied: use 0.093 gage for recess diameters up to 0.150 in. (it is not practical to gage screw sizes No. 0 and No. 1 having recess diameters of less than 0.102 in. maximum); use 0.141 gage for recess diameters of 0.150 and up to 0.270 in.; use 0.246 gage for recess diameters of 0.270 and up to 0.460 in.; and use 0.436 gage for recess diameters of 0.460 and up to 0.700 in.

(b) For additional reference, see Table III-4 Illustration on previous page.

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Gage Head

Table III-6 Dimensions for Penetration Gage Heads for Type III Recess

Size of Recess Gage		00	0	1	2	3	4
A	(+0.0002 −0.0002)	0.1015	0.1015	0.1420	0.1615	0.2100	0.2715

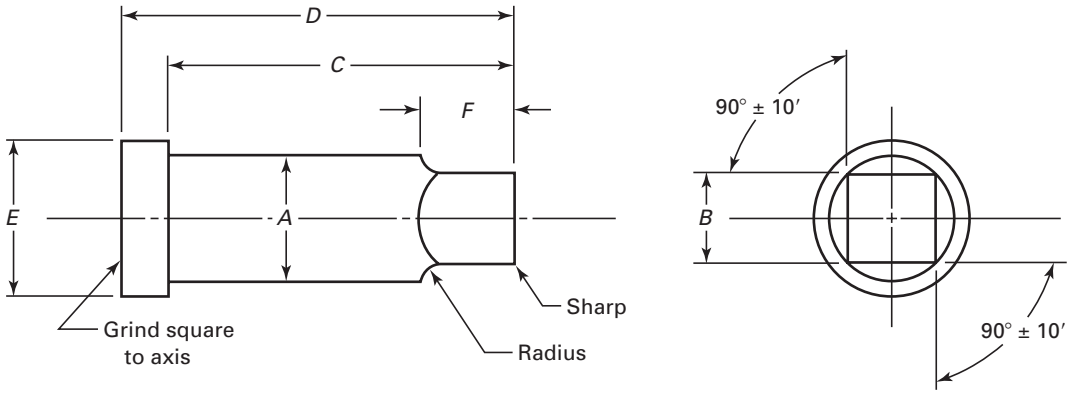


Table III-7 Dimensions of Type III Square Penetration Gage Points

Size of Recess Gage	Gage Point Diameter, *A*, (+0.0005 −0.0000)	Width Across Flats, *B*, (+0.0005 −0.0000)	Stem Length, *C*, (+0.005 −0.005)	Overall Length, *D*, (+0.005 −0.005)	Head Diameter, *E*, (+0.000 −0.015)	Point Length, *F*, (+0.030 −0.000)
00	0.1005	0.0490	0.785	0.875	0.187	0.075
0	0.1005	0.0690	0.785	0.875	0.187	0.125
1	0.1405	0.0900	0.785	0.875	0.187	0.187
2	0.1605	0.1110	0.785	0.875	0.250	0.187
3	0.2085	0.1315	0.785	0.875	0.250	0.187
4	0.2705	0.1895	0.785	0.875	0.312	0.212

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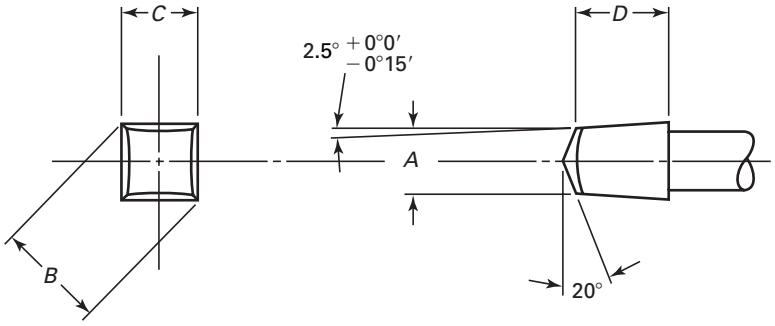


Table III-8 Dimensions of Type III Square Fit Gage Points

Size of Recess Gage	Across Flats at Point, *A*		Across Corners, *B*, Ref.	Across Flats at Top, *C*, Ref.	Length, *D*	
	Max.	Min.			Max.	Min.
00	0.0500	0.0495	0.0861	0.0609	0.125	0.105
0	0.0700	0.0695	0.1153	0.0815	0.145	0.125
1	0.0908	0.0903	0.1447	0.1023	0.145	0.125
2	0.1121	0.1116	0.1787	0.1263	0.176	0.156
3	0.1327	0.1322	0.2117	0.1497	0.207	0.187
4	0.1905	0.1900	0.3012	0.2130	0.270	0.250

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MANDATORY APPENDIX IV
WOBBLE GAGING OF RECESSED HEADS

Wobble gaging provides a means for determining the compatibility of recesses in the heads of screws with companion screw drivers, and will indicate the point where deviations in the recess contours affect satisfactory driver engagement. Recesses that exhibit excessive wobble characteristics will result in poor screw driveability because of driver camout prior to attaining normal torque level, damage to recesses, and/or accelerated driver wear.

The allowable total wobble gaging limits for the various types of recesses included herein were predicated originally on the gaging of plain finish (unplated or uncoated) screws. However, subsequent experience has shown these limits to be suitable for the gaging of screws having coating thickness up to and including 0.0003 in., on significant surfaces. Screws having heavier coatings that fail to meet the wobble gaging requirements must be stripped of finish and gaged for acceptance or rejection in the plain condition.

Wobble gaging fixtures, as illustrated in Table IV-1, and appropriate recess master plug gages with handles and position indicators punch for the respective recess types are available through the screw suppliers. Dimensions of the points on master plug gages are, except for the body diameters tabulated herein, the same as those specified for the respective gage points in Appendix III.

The screw to be gaged shall be placed into the screw-holding chuck and oriented such that one set of recess wings or one side is parallel to the upright back plate. The screw shall be so positioned and the chuck shall be tightened sufficiently to prevent any tilting of the screw in the chuck when taking wobble readings.

The position gage pointer and handle with the proper master plug gage for the recess size being checked shall be positioned in the slot of the degree scale on the top plate and the point of the plug gage inserted into the screw recess. It is essential that registry between the cross lines of pointer and the recess wings or side be maintained. To correct any misalignment, the chuck position lock screw is loosened, the chuck is rotated until registry is obtained, and the chuck is raised or lowered until the gage pointer is flush with the top of the degree scale. The chuck position lock screw is then tightened and the readings taken. The gage handle, with downward pressure applied, is moved from side to side until resistance is encountered and the total reading between points of travel of the gage pointer is recorded. The allowable angular wobble limits shall not exceed the values tabulated in Tables IV-2, IV-3, and IV-4. Cross lines on the gage pointer should be rechecked with plug gage wings or flats to make certain cross lines and gage wings or flats are registered on identical radials.

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Table IV-1 Gage Body Diameters

Size of Recess Gage	Type I Recess Ground Gage		Type IA Recess			
			Ground Gage		Pressed Gage	
	Max.	Min.	Max.	Min.	Max.	Min.
No. 0	0.135	0.115	0.135	0.115	. . .	. . .
No. 1	0.198	0.178	0.198	0.178	0.275	0.255
No. 2	0.260	0.240	0.260	0.240	0.275	0.255
No. 3	0.323	0.303	0.323	0.303	0.370	0.350
No. 4	0.385	0.365	0.385	0.365	0.475	0.455
No. 5	0.760	0.740	0.760	0.740	. . .	. . .

GENERAL NOTE: Diameters of Type II recess gages are same as penetration gage points in Appendix III.

Table IV-2 Gaging Limits for Type I and Type IA Recesses

Size of Recess Gage	Maximum Allowable Total Wobble, deg	
	Type I	Type IA
No. 0	. . .	. . .
No. 1	15	12
No. 2	12	10
No. 3	10	8
No. 4	10	8
No. 5	10	8

Table IV-3 Gaging Limits for Type II Recess

Recess Gage Diameter	Maximum Allowable Total Wobble, deg
0.093	12
0.141	10
0.246	8
0.436	6

Table IV-4 Gaging Limits for Type III Recesses

Recess Size	Maximum Allowable Total Wobble, deg
00	6
0	6
1	5
2	4
3	4
4	3

GENERAL NOTE: Since Type III Square Drives are meant to be slight "stick" fit on the driver, therefore any wobble may be considered excessive by some users. The values shown here are what is felt to be the maximum allowable without affecting drivability. "No Wobble" may be specified and agreed to by the manufacturer and the purchaser prior to the start of production.

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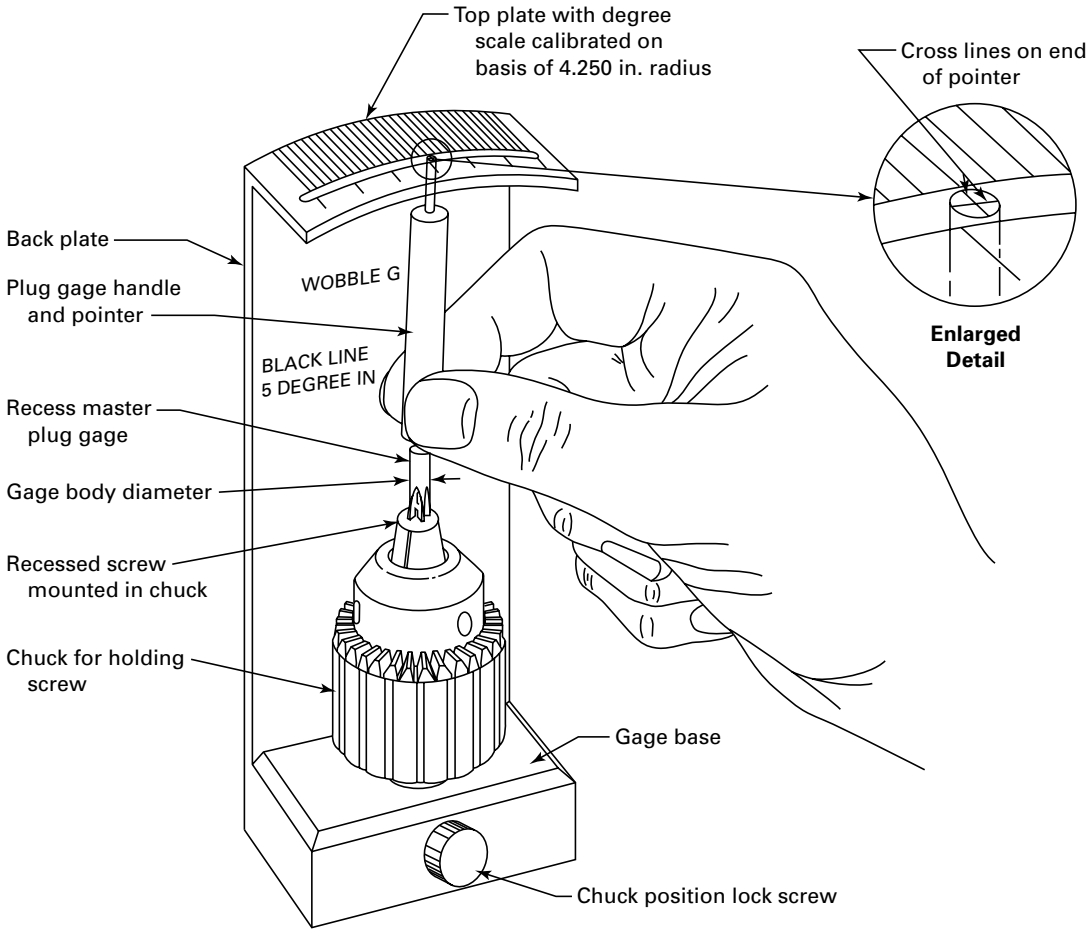


Fig. IV-1 Wobble Gaging Fixture

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MANDATORY APPENDIX V
DIMENSIONS FOR NO. 0000, NO. 000, AND NO. 00 THREAD SIZES

The following dimensional data for the No. 0000, No. 000, and No. 00 thread sizes is provided in Table V-1 for convenient reference until such time as these thread sizes may be adequately documented in an appropriate standard relating specifically to screw threads.

Table V-1 Dimensions for No. 0000, No. 000, and No. 00 Thread Sizes

Nominal Size and Threads per Inch [Note (1)]	Series Designation	External							
				Major Diameter		Pitch Diameter			Minor Diameter
		Class	Allowance	Max.	Min.	Max.	Min.	Tol.	
0000–160 or 0.0210–160	NS	2	0.0000	0.0210	0.0195	0.0169	0.0158	0.0011	0.0128
000–120 or 0.0340–120	NS	2	0.0000	0.0340	0.0325	0.0286	0.0272	0.0014	0.0232
00–90 or 0.0470–90	NS	2	0.0000	0.0470	0.0450	0.0398	0.0382	0.0016	0.0326
00–96 or 0.0470–96	NS	2	0.0000	0.0470	0.0450	0.0402	0.0386	0.0016	0.0334

Nominal Size and Threads per Inch [Note (1)]	Series Designation	Internal						
			Minor Diameter [Note (2)]		Pitch Diameter			Major Diameter, Min.
		Class	Min.	Max.	Min.	Max.	Tol.	
0000–160 or 0.0210–160	NS	2	...	...	0.0169	0.0181	0.0012	0.0210
000–120 or 0.0340–120	NS	2	...	...	0.0286	0.0300	0.0014	0.0340
00–90 or 0.0470–90	NS	2	...	...	0.0398	0.0414	0.0016	0.0470
00–96 or 0.0470–96	NS	2	...	...	0.0402	0.0418	0.0016	0.0470

NOTES:
(1) Where specifying nominal size in decimals, zeros preceding the decimal and in the fourth decimal place shall be omitted.
(2) The minor diameter limits for internal threads are not specified; they are determined by the amount of thread engagement necessary to satisfy the strength requirements and tapping performance in the intended application.

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NONMANDATORY APPENDIX A
FORMULAS FOR DIMENSIONS

Formulas for the dimensions of head diameter, head height, and slot depth for various types of head crews are provided in Tables A-1 through A-14.

Formulas for dimensions of square and hex nuts are provided in Table A-15.

Table A-1 Flat Countersunk Head Screws

Screw Size	Head Diameter	Head Height	Slot Depth
0000 thru 00	No formulas; see tables	No formulas; see tables	No formulas; see tables
0 thru 3/8	Max. A (sharp) = 2.040 D − 0.003 ref. [Note (1)] Min. A (sharp) = 1.960 D − 0.013 ref. [Note (1)] Max. A (rounded or flat) = 1.920 D − 0.003 [Note (2)] Min. A (rounded or flat) = 1.820 D − 0.013 [Note (2)] Gaging diameter G = 1.830 D − 0.033	Max. H = 0.619 D − 0.002 Min. H = 0.552 D − 0.007 ref. [Note (1)]	Max. T = 0.288 D − 0.002 Min. T = 0.192 D − 0.002
7/16	Max. A (sharp) = 2.000 D − 0.063 ref. [Note (1)] Min. A (sharp) = 1.920 D − 0.073 ref. [Note (1)] Max. A (rounded or flat) = 1.880 D − 0.063 [Note (2)] Min. A (rounded or flat) = 1.800 D − 0.073 [Note (2)] Gaging diameter G = 1.790 D − 0.093	Max. H = 0.596 D − 0.038 Min. H = 0.529 D − 0.042 ref. [Note (1)]	Max. T = 0.274 D − 0.017 Min. T = 0.184 D − 0.015
1/2 thru 3/4	Max. A (sharp) = 2.000 D − 0.125 ref. [Note (1)] Min. A (sharp) = 1.920 D − 0.135 ref. [Note (1)] Max. A (rounded or flat) = 1.880 D − 0.125 [Note (2)] Min. A (rounded or flat) = 1.800 D − 0.135 [Note (2)] Gaging diameter G = 1.790 D − 0.155	Max. H = 0.596 D − 0.075 Min. H = 0.529 D − 0.078 ref. [Note (1)]	Max. T = 0.274 D − 0.034 Min. T = 0.184 D − 0.027

GENERAL NOTE: D is the basic diameter of the screw.

NOTES:

(1) Values no longer tabulated; formulas are retained here for reference purposes only.

(2) Values based on a sidewall of approximately 2 1/2% of the head diameter.

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Table A-2 Undercut Flat Countersunk Head Screws

Screw Size	Head Diameter		
0 thru 3/8	Max. A (sharp) = 2.040 D − 0.003 ref. [Note (1)] Min. A (sharp) = 1.960 D − 0.013 ref. [Note (1)] Max. A (rounded or flat) = 1.920 D − 0.003 [Note (2)] Min. A (rounded or flat) = 1.820 D − 0.013 [Note (2)] Gaging diameter G = 1.830 D − 0.033		
7/16	Max. A (sharp) = 2.000 D − 0.063 ref. [Note (1)] Min. A (sharp) = 1.920 D − 0.073 ref. [Note (1)] Max. A (rounded or flat) = 1.880 D − 0.063 [Note (2)] Min. A (rounded or flat) = 1.800 D − 0.073 [Note (2)] Gaging diameter G = 1.790 D − 0.093		
1/2	Max. A (sharp) = 2.000 D − 0.125 ref. [Note (1)] Min. A (sharp) = 1.920 D − 0.135 ref. [Note (1)] Max. A (rounded or flat) = 1.880 D − 0.125 [Note (2)] Min. A (rounded or flat) = 1.800 D − 0.135 [Note (2)] Gaging diameter G = 1.790 D − 0.155		
Screw Size	**Head Height**		**Slot Depth**
0 thru 3/8	Max. H = 0.432 D − 0.001 Min. H = 0.386 D − 0.005		Max. T = 0.202 D − 0.001 Min. T = 0.134 D − 0.001
7/18	Max. H = 0.417 D − 0.026 Min. H = 0.370 D − 0.029		Max. T = 0.192 D − 0.012 Min. T = 0.129 D − 0.011
1/2	Max. H = 0.417 D − 0.052 Min. H = 0.370 D − 0.055		Max. T = 0.192 D − 0.024 Min. T = 0.129 D − 0.019

GENERAL NOTE: D is the basic diameter of the screw.

NOTES:

(1) Values no longer tabulated; formulas are retained here for reference purposes only.

(2) Values based on a sidewall of approximately 2 1/2% of the head diameter.

Table A-3 100 deg Flat Countersunk Head Screws

Screw Size	Head Diameter	Head Height	Slot Depth
0000 thru 00	No formulas; see tables	No formulas; see tables	No formulas; see tables
0 thru 3/8	Max. A (sharp) = 2.040 D − 0.003 ref. [Note (1)] Min. A (sharp) = 1.960 D − 0.013 ref. [Note (1)] Max. A (rounded or flat) = 1.920 D − 0.003 [Note (2)] Min. A (rounded or flat) = 1.800 D − 0.013 [Note (2)] Gaging diameter G = 1.790 D − 0.033	Max. H = 0.444 D − 0.001 Min. H = 0.396 D − 0.005 ref. [Note (1)]	Max. T = 0.222 D − 0.0005 Min. T = 0.184 D − 0.004

GENERAL NOTE: D is the basic diameter of the screw.

NOTES:

(1) Values no longer tabulated; formulas are retained here for reference purposes only.

(2) Values based on a sidewall of approximately 2 1/2% of the head diameter.

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Table A-4 Close Tolerance 100 deg Flat Countersunk Head Screws

Screw Size	Head Diameter	Head Height	Slot Depth
0 thru $\frac{5}{8}$	Max. A (sharp) = 2.040 D − 0.003 ref. [Note (1)] Min. A (sharp) = 2.000 D − 0.009 ref. [Note (1)] Max. A (rounded or flat) = 1.920 D − 0.003 [Note (2)] Min. A (rounded or flat) = 1.800 D − 0.013 [Note (2)] Gaging diameter G = 1.790 D − 0.033	Max. H = 0.444 D − 0.001 Min. H = 0.396 D − 0.005 ref. [Note (1)]	Max. T = 0.222 D − 0.0005 Min. T = 0.184 D − 0.004

GENERAL NOTE: D is the basic diameter of the screw.

NOTES:

(1) Values no longer tabulated; formulas are retained here for reference purposes only.

(2) Values based on a sidewall of approximately $2\frac{1}{2}$% of the head diameter.

Table A-5 Oval Countersunk Head Screws

Screw Size	Head Diameter	Total Head Height
00	No formulas; see tables	No formulas; see tables
0 thru $\frac{3}{8}$	Max. A (sharp) = 2.040 D − 0.003 ref. [Note (1)] Min. A (sharp) = 1.960 D − 0.013 ref. [Note (1)] Max. A (rounded or flat) = 1.920 D − 0.003 [Note (2)] Min. A (rounded or flat) = 1.820 D − 0.013 [Note (2)] Gaging diameter G = 1.830 D − 0.033	Max. O = 0.923 D + 0.001 Min. O = 0.820 D − 0.008
$\frac{7}{16}$	Max. A (sharp) = 2.000 D − 0.063 ref. [Note (1)] Min. A (sharp) = 1.920 D − 0.073 ref. [Note (1)] Max. A (rounded or flat) = 1.880 D − 0.063 [Note (2)] Min. A (rounded or flat) = 1.800 D − 0.073 [Note (2)] Gaging diameter G = 1.790 D − 0.093	Max. O = 0.896 D − 0.047 Min. O = 0.789 D − 0.050
$\frac{1}{2}$ thru $\frac{3}{4}$	Max. A (sharp) = 2.000 D − 0.125 ref. Min. A (sharp) = 1.920 D − 0.135 ref. Max. A (rounded or flat) = 1.880 D − 0.125 [Note (2)] Min. A (rounded or flat) = 1.800 D − 0.135 [Note (2)] Gaging diameter G = 1.790 D − 0.155	Max. O = 0.896 D − 0.094 Min. O = 0.789 D − 0.094

Screw Size	Head Side Height	Slot Depth
00	No formulas; see tables	No formulas; see tables
0 thru $\frac{3}{8}$	Max. H = 0.619 D − 0.002 Min. H = 0.552 D − 0.007 ref. [Note (1)]	Max. T = 0.556 D − 0.003 Min. T = 0.460 D − 0.003
$\frac{7}{16}$	Max. H = 0.596 D − 0.038 Min. H = 0.529 D − 0.042 ref. [Note (1)]	Max. T = 0.547 D − 0.029 Min. T = 0.466 D − 0.030
$\frac{1}{2}$ thru $\frac{3}{4}$	Max. H = 0.596 D − 0.075 Min. H = 0.529 D − 0.078 ref. [Note (1)]	Max. T = 0.547 D − 0.057 Min. T = 0.466 D − 0.055

GENERAL NOTE: D is the basic diameter of the screw.

NOTES:

(1) Values no longer tabulated; formulas are retained here for reference purposes only.

(2) Values based on a sidewall of approximately $2\frac{1}{2}$% of the head diameter.

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Table A-6 Undercut Oval Countersunk Head Screws (Same as Oval Countersunk Head Except as Shown Below)

Screw Size	Total Head Height	Head Side Height	Slot Depth
0 thru $\frac{3}{8}$	Max. $O = 0.736\ D + 0.002$ Min. $O = 0.654\ D - 0.006$	Max. $H = 0.432\ D - 0.001$ Min. $H = 0.386\ D - 0.005$ ref. [Note (1)]	Max. $T = 0.480\ D - 0.001$ Min. $T = 0.402\ D - 0.002$
$\frac{7}{16}$	Max. $O = 0.717\ D - 0.035$ Min. $O = 0.630\ D - 0.037$	Max. $H = 0.417\ D - 0.026$ Min. $H = 0.370\ D - 0.029$ ref. [Note (1)]	Max. $T = 0.473\ D - 0.023$ Min. $T = 0.404\ D - 0.023$
$\frac{1}{2}$	Max. $O = 0.717\ D - 0.071$ Min. $O = 0.630\ D - 0.071$	Max. $H = 0.417\ D - 0.052$ Min. $H = 0.370\ D - 0.055$ ref. [Note (1)]	Max. $T = 0.473\ D - 0.033$ Min. $T = 0.404\ D - 0.033$

GENERAL NOTES:
(a) Formulas same as for oval countersunk head except as shown above.
(b) D is the basic diameter of the screw.

NOTE:
(1) Values no longer tabulated; formulas are retained here for reference purposes only.

Table A-7 Pan Head Screws

Screw Size	Head Diameter	Head Height		Slot Depth
		Slotted	Recessed	
0000 thru 00	No formulas; see tables	No formulas; see tables	. . .	No formulas; see tables
0 thru 12	Max. $A = 1.980\ D - 0.003$ Min. $A = 1.940\ D - 0.012$	Max. $H = 0.550\ D + 0.006$ Min. $H = 0.520\ D$	Max. $H = 0.692\ D + 0.002$ Min. $H = 0.652\ D - 0.003$	Max. $T = 0.350\ D + 0.001$ Min. $T = 0.300\ D - 0.004$
$\frac{1}{4}$ thru $\frac{1}{2}$	Max. $A = 1.980\ D - 0.003$ Min. $A = 1.940\ D - 0.012$	Max. $H = 0.550\ D + 0.006$ Min. $H = 0.520\ D$	Max. $H = 0.692\ D + 0.002$ Min. $H = 0.652\ D - 0.001$	Max. $T = 0.293\ D + 0.014$ Min. $T = 0.246\ D + 0.008$
$\frac{9}{16}$ thru $\frac{3}{4}$	Max. $A = 2.100\ D - 0.140$ Min. $A = 2.000\ D - 0.125$	Max. $H = 0.550\ D + 0.006$ Min. $H = 0.520\ D$	Max. $H = 0.692\ D + 0.002$ Min. $H = 0.652\ D - 0.001$	Max. $T = 0.293\ D + 0.014$ Min. $T = 0.246\ D + 0.008$

GENERAL NOTE: D is the basic diameter of the screw.

Table A-8 Truss Head Screws

Screw Size	Head Diameter	Head Height	Slot Depth
0000 thru 00	No formulas; see tables	No formulas; see tables	No formulas; see tables
0 thru 12	Max. $A = 2.440\ D - 0.015$ Min. $A = 2.360\ D - 0.023$	Max. $H = 0.620\ D$ Min. $H = 0.570\ D - 0.005$	Max. $T = 0.350\ D + 0.001$ Min. $T = 0.300\ D - 0.004$
$\frac{1}{4}$ thru $\frac{3}{4}$	Max. $A = 2.000\ D + 0.073$ Min. $A = 1.930\ D + 0.063$	Max. $H = 0.520\ D + 0.020$ Min. $H = 0.470\ D + 0.015$	Max. $T = 0.293\ D + 0.014$ Min. $T = 0.246\ D + 0.008$

GENERAL NOTE: D is the basic diameter of the screw.

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Table A-9 Fillister Head Screws

Screw Size	Head Diameter	Total Head Height	Slot Depth
0000 thru 1	No formulas; see tables	No formulas; see tables	No formulas; see tables
2 thru $\frac{3}{8}$	Max. $A = 1.670\ D - 0.004$ Min. $A = 1.610\ D - 0.014$	Max. $O =$ max. $H +$ max. F Min. $O =$ min. $H +$ min. F	Max. $T = 0.440\ D - 0.001$ Min. $T = 0.374\ D - 0.007$
$\frac{7}{16}$	Max. $A = 1.000\ D + 0.188$ Min. $A = 0.940\ D + 0.178$	Max. $O =$ max. $H +$ max. F Min. $O =$ min. $H +$ min. F	Max. $T = 0.500$ (min. O) $+ 0.010$ Min. $T =$ max. $T - 0.066\ D - 0.005$
$\frac{1}{2}$ thru $\frac{3}{4}$	Max. $A = 1.000\ D + 0.250$ Min. $A = 0.940\ D + 0.240$	Max. $O =$ max. $H +$ max. F Min. $O =$ min. $H +$ min. F	Max. $T = 0.500$ (min. O) $+ 0.010$ Min. $T =$ max. $T - 0.066\ D - 0.005$

Screw Size	Head Side Height	Oval Height
0000 thru 1	No formulas; see tables	No formulas; see tables
2 thru $\frac{3}{8}$	Max. $H = 0.660\ D + 0.005$ Min. $H = 0.622\ D$	Max. $F = 0.280\ D - 0.003$ Min. $F = 0.240\ D - 0.008$
$\frac{7}{16}$	Max. $H = 0.550\ D + 0.022$ Min. $H = 0.510\ D + 0.017$	Max. $F = 0.220\ D + 0.006$ Min. $F = 0.180\ D + 0.001$
$\frac{1}{2}$ thru $\frac{3}{4}$	Max. $H = 0.550\ D + 0.027$ Min. $H = 0.510\ D + 0.022$	Max. $F = 0.220\ D + 0.008$ Min. $F = 0.180\ D + 0.003$

GENERAL NOTE: D is the basic diameter of the screw.

Table A-10 Drilled Fillister Head Screws

Screw Size	Head Diameter	Total Head Height	Head Side Height	Oval Height
0 thru $\frac{3}{8}$	Max. $A = 1.670\ D - 0.004$ Min. $A = 1.610\ D - 0.014$	Max. $O =$ max. $H +$ max. F Min. $O =$ min. $H +$ min. F	Max. $H = 0.660\ D + 0.005$ Min. $H = 0.645\ D$	Max. $F = 0.280\ D - 0.003$ Min. $F = 0.265\ D - 0.008$

GENERAL NOTE: D is the basic diameter of the screw.

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Table A-11 Binding Head Screws

Screw Size	Head Diameter	Total Head Height	Oval Height
0000 thru 00	No formulas; see tables	No formulas; see tables	No formulas; see tables
0 thru $\frac{3}{8}$	Max. $A = 2.100\ D$ Min. $A = 1.990\ D$	Max. $O = 0.700\ D - 0.010$ Min. $O = 0.665\ D - 0.014$	Max. $F = 0.260\ D - 0.004$ Min. $F = 0.200\ D - 0.004$

Screw Size	Slot Depth	Undercut Diameter	Undercut Depth
0000 thru 00	No formulas; see tables	No formulas; see tables	No formulas; see tables
0 thru $\frac{3}{8}$	Max. $T = 0.460\ D - 0.010$ Min. $T = 0.390\ D - 0.014$	Max. $U = 1.640\ D$ Min. $U = 1.440\ D$	Max. $X = 0.100\ D + 0.001$ Min. $X = 0.100\ D - 0.004$

GENERAL NOTE: D is the basic diameter of the screw.

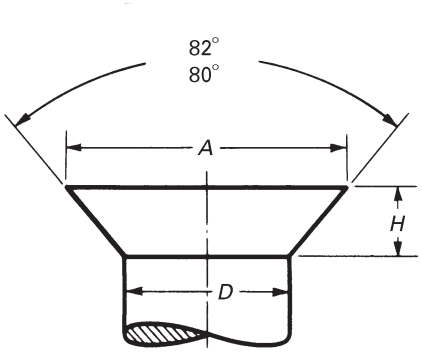
Table A-12 Round Head Screws

Screw Size	Head Diameter	Head Height	Slot Depth
0000 thru 00	No formulas; see tables	No formulas; see tables	No formulas; see tables
0 thru $\frac{3}{8}$	Max. $A = 1.887\ D$ Min. $A = 1.813\ D - 0.010$	Max. $H = 0.645\ D + 0.014$ Min. $H = 0.615\ D + 0.006$	Max. $T = 0.367\ D + 0.017$ Min. $T = 0.277\ D + 0.013$
$\frac{7}{16}$	Max. $A = 2.000\ D - 0.125$ Min. $A = 1.926\ D - 0.135$	Max. $H = 0.875\ D - 0.055$ Min. $H = 0.845\ D - 0.063$	Max. $T = 0.498\ D - 0.023$ Min. $T = 0.380\ D - 0.018$
$\frac{1}{2}$ and $\frac{9}{16}$	Max. $A = 2.000\ D - 0.188$ Min. $A = 1.926\ D - 0.198$	Max. $H = 0.875\ D - 0.082$ Min. $H = 0.845\ D - 0.090$	Max. $T = 0.498\ D - 0.038$ Min. $T = 0.380\ D - 0.031$
$\frac{5}{8}$ and $\frac{3}{4}$	Max. $A = 2.000\ D - 0.250$ Min. $A = 1.926\ D - 0.260$	Max. $H = 0.875\ D - 0.109$ Min. $H = 0.845\ D - 0.117$	Max. $T = 0.498\ D - 0.053$ Min. $T = 0.380\ D - 0.043$

GENERAL NOTE: D is the basic diameter of the screw.

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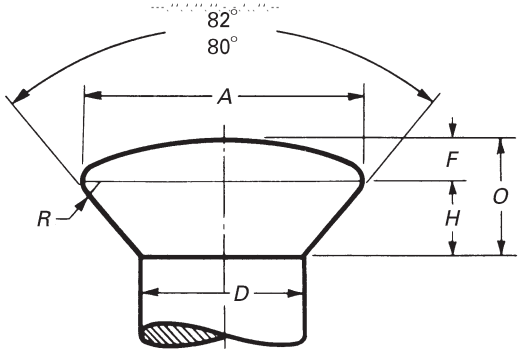


Table A-13 Flat and Oval Countersunk Trim Head Screws

Oval Head			Flat Head						
Head Height *H* for All Screw Sizes [Note (1)]	Total Head Height for All Screw Sizes	Head Radius Ref. for All Screw Sizes	Head Height *H* for All Screw Sizes	Screw Size	Head Size	Shank Diameter, *D*, Max.	Head Diameter Max.	Head Diameter Min.	Oval Height, *F*, Ref.
For max. *H*, use max. shank diameter *D*, min. angle 80° max. head diameter *A*, and nominal radius *R*.	Max. *O* = max. *H* + *F*	Nom. *R* = 0.08 min. *A*	Max. $H = \frac{\text{max. } A - D}{2(\tan 40°)}$	4	3	0.112	0.187	0.167	0.033
				5	4	0.125	0.212	0.191	0.037
				6	4	0.138	0.212	0.191	0.037
				6	5	0.138	0.237	0.215	0.041
For min. *H*, use max. shank diameter *D*, max. angle 82° min. head diameter *A*, and nominal radius *R*	Min. *O* = min. *H* + *F*		Min. $H = \frac{\text{min. } A - D}{2(\tan 41°)}$ ref. [Note (2)]	8	5	0.164	0.237	0.215	0.041
				8	6	0.164	0.262	0.238	0.045
				10	8	0.190	0.312	0.285	0.076
				12	8	0.216	0.312	0.285	0.076
				12	10	0.216	0.362	0.333	0.060
				1/4	10	0.250	0.362	0.333	0.060
				1/4	12	0.250	0.412	0.380	0.068
				5/16	12	0.3125	0.412	0.380	0.068
				5/16	1/4	0.3125	0.477	0.442	0.079
				3/8	5/16	0.375	0.597	0.556	0.099

GENERAL NOTES:

(a) *D* is the basic diameter of the screw.

(b) Head diameters for head sizes indicated are derived from formulas for flat and oval countersunk head screws shown in Tables A1–A5.Requirements for new head and body combinations should be referred to the subcommittee for development of proper dimensions.

NOTES:

(1) Dimensions have been determined on large scale layouts using the dimensions specified in the accompanying table in the following manner.

(2) Values no longer tabulated; formulas are retained here for reference purposes only.

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Table A-14 Slot Width in Slotted Head Screws

Screw Size	Basic Width	Tolerance		
		Screw Size	Plus	Minus
0000 thru 00	No formula; see tables	. . .	. . .	. . .
0 thru 10	Basic slot width = 0.280 D + 0.004 adjusted to standard cutter size	0 and 1	0.003	0.004
		2, 3, 4, and 5	0.003	0.005
		6 and 8	0.004	0.005
		10	0.005	0.006
12 thru $\frac{3}{4}$	Basic slot width = 0.160 D + 0.024 adjusted to standard cutter size	12 and $\frac{1}{4}$	0.005	0.006
		$\frac{5}{16}$	0.005	0.007
		$\frac{3}{8}$ and $\frac{7}{16}$	0.005	0.008
		$\frac{1}{2}$, $\frac{9}{16}$, and $\frac{5}{8}$	0.006	0.009
		$\frac{3}{4}$	0.007	0.009

GENERAL NOTE: D is the basic diameter of the screw.

Table A-15 Machine Screw Nuts

Nut Size	Width Across Flats, Square and Hex	Width Across Corners		Thickness, Square and Hex
		Square	Hex	
0 thru 12	No formulas; see table	Max. G = 1.4142 max. F Min. G = 1.373 min. F	Max. G = 1.1547 max. F Min. G = 1.14 min. F	No formulas; see table
$\frac{1}{4}$ thru $\frac{3}{8}$	Basic F = 1.500 D + 0.062 [Note (1)] Max. *F:* see table Min. *F:* see table	Max. G = 1.4142 max. F Min. G = 1.373 min. F	Max. G = 1.1547 max. F Min. G = 1.14 min. F	No formulas; see table

GENERAL NOTE: D is the basic diameter of the thread.

NOTE:

(1) Adjusted to sixteenths of an inch.

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NONMANDATORY APPENDIX B
WRENCH OPENINGS FOR HEX HEAD SCREWS, AND SQUARE AND HEX NUTS

Dimensions for wrench openings for hex head screws, hex and square machine screw nuts are provided below in Table B-1.

Table B-1 Wrench Openings for Hex Head Screws, Square, and Hex Nuts

Nominal Size of Wrench; Also Basic (Maximum) Width Across Flats of Screw Head or Nut [Note (1)]	Allowance Between Product Flats and Jaws of Wrench [Note (2)]	Wrench Openings			Nominal Product Sizes			
					Hex Head Screws		Hex Washer Head Screws	Hex and Square Machine Screw Nuts
		Min.	Tolerance [Note (2)]	Max.	Regular Hex	Large Hex		
1/8 0.1250	0.002	0.127	0.005	0.132	1 & 2	...	2 & 3	...
5/32 0.1562	0.002	0.158	0.005	0.163	...	...	...	0 & 1
3/16 0.1875	0.002	0.190	0.005	0.195	3, 4, & 5	...	4 & 5	2 & 3
7/32 0.2187	0.002	0.220	0.005	0.225	...	4	...	...
1/4 0.2500	0.002	0.252	0.005	0.257	6 & 8	5	6 & 8	4
5/16 0.3125	0.003	0.316	0.006	0.322	10 & 12	8	10 & 12	5 & 6
11/32 0.3438	0.003	0.347	0.006	0.353	...	...	...	8
3/8 0.3750	0.003	0.378	0.006	0.384	1/4	12	1/4	10
7/16 0.4375	0.003	0.440	0.006	0.446	...	1/4	...	12 & 1/4
1/2 0.5000	0.004	0.504	0.006	0.510	5/16	...	5/16	...
9/16 0.5625	0.004	0.566	0.007	0.573	3/8	...	3/8	5/16
5/8 0.6250	0.004	0.629	0.007	0.636	...	...	...	3/8

NOTES:

(1) Wrenches shall be marked with the nominal size of wrench, which is equal to the basic (maximum) width across flats of the corresponding screw head or nut.

(2) The allowance (minimum clearance) between maximum width across flats of screw head or nut and jaws of wrench equals (0.005 *W* + 0.001). The tolerance on wrench opening equals plus (0.005 *W* + 0.004 from minimum). *W* equals the nominal size of the wrench.

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Large Rivets B18.1.2-1972 (R2001)
Metric Small Solid Rivets B18.1.3M-1983 (R2001)
Square and Hex Bolts and Screws (Inch Series) B18.2.1-1996
Square and Hex Nuts (Inch Series) B18.2.2-1987 (R1999)
Metric Hex Cap Screws B18.2.3.1M-1999
Metric Formed Hex Screws B18.2.3.2M-1979 (R1995)
Metric Heavy Hex Screws B18.2.3.3M-1979 (R2001)
Metric Hex Flange Screws B18.2.3.4M-2001
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