

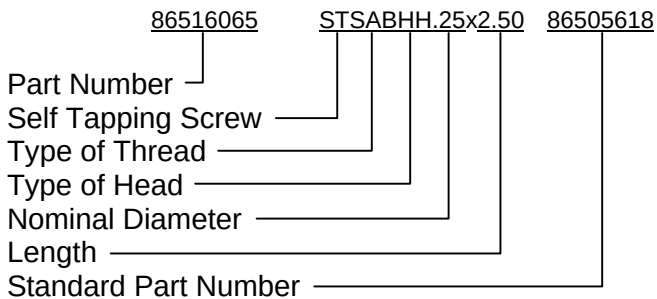
Self Tapping Screws—Thread Forming and Thread Cutting

1. SCOPE

The fasteners defined by this specification are thread forming and thread cutting self-tapping screws.

2. DESIGNATION

2.1 Typical call out on a drawing shall be:



NOTE: The above descriptions are required for used in all company wide computer generated documents. The descriptions on hand drawn assembly drawings should follow the same practice.

2.2 Table 19 lists all the available parts. Those parts that are highlighted are non-preferred. Table 20 list the sizes available through Case Corporation.

2.3 When requesting a new part number, refer to the instructions in standard 86505922 (FNHA-3-A-005.00).

3. RELATED SPECIFICATIONS

3.1 REFERENCE STANDARDS

86508305 (FNHA-2-H-500.00)—Zinc Electroplating on Ferrous Surfaces

86505922 (FNHA-3-A-005.00)—Assignment of Standard Parts Part Numbers

ASME B18.6.4—Thread Forming and Thread Cutting Tapping Screws and Metallic Drive Screws

SAE J123—Surface Discontinuities on Bolts, Screws, and Studs

3.2 This standard replaces the following company standards:

New Holland	NA2.02.15
Versatile	1-A-011

4. REQUIREMENTS

4.1 MATERIALS

High quality carbon steel, case hardened to meet performance requirements of the Drive Test, Torsional Strength Test, and Ductility Test per standard ASME B18.6.4.

4.2 PLATING

4.2.1 Preferred

Gold zinc chromate (ZnCr) electroplate 86508316 (FNHA-2-H-500.25) per standard 86508305 (FNHA-2-H-500.00). Baking (86512106) per standard 86508305 (FNHA-2-H-500.00) is required for hydrogen embrittlement relief.

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ALL	K	BJF	120060	04DEC02	THE INFORMATION HEREON IS THE CONFIDENTIAL AND PROPRIETARY PROPERTY OF NEW HOLLAND N. V. AND/OR ITS SUBSIDIARIES. ANY USE, EXCEPT THAT FOR WHICH IT MAY BE LOANED, IS PROHIBITED.	FRAME	OF	
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4.2.2 Non-Preferred

(a) Parts are not plated (Plain)

(b) Phosphate and oil coating (P+O) 86508340 (FNHA-2-H-501.02) per standard 86508306 (FNHA-2-H-501.00).

(c) Black zinc chromate (ZnCr/B) electroplate 86508320 (FNHA-2-H-500.35) per standard 86508305 (FNHA-2-H-500.00). Baking (86512106) per standard 86508305 (FNHA-2-H-500.00) is required for hydrogen embrittlement relief.

(d) Black teflon (Blk Teflon)

4.3 THREAD TYPES

Covered in Tables 1 through 6 are per ASME B18.6.4.

4.3.1 Preferred Types

AB, B, and F

4.3.2 Non-Preferred Types

BF, BP, BT, D, G, and T

4.3.3 Not recommended for new designs

A and C

4.4 HEAD STYLES

4.4.1 Head type dimensions

Covered in Tables 7 through 18 are per ASME B18.6.4.

4.4.2 Head Abbreviations

FH—Flat Countersunk head

OH—Oval head

PH—Pan head

RH—Round head

TH—Truss head

HH—Hex Head

HWH—Hex washer head

4.5 SCREW DRIVE (Recess) TYPES

4.5.1 Preferred Type

Type 1 cross recess (Cross) per ASME B18.6.4

4.5.2 Non-Preferred Types

(a) Slot (Slot) per ASME B18.6.4

(b) Torx drive

4.6 SURFACE DISCONTINUITIES

All products under this specification shall meet the Surface Discontinuities on Bolts, Screws, and Studs per standard SAE J123.

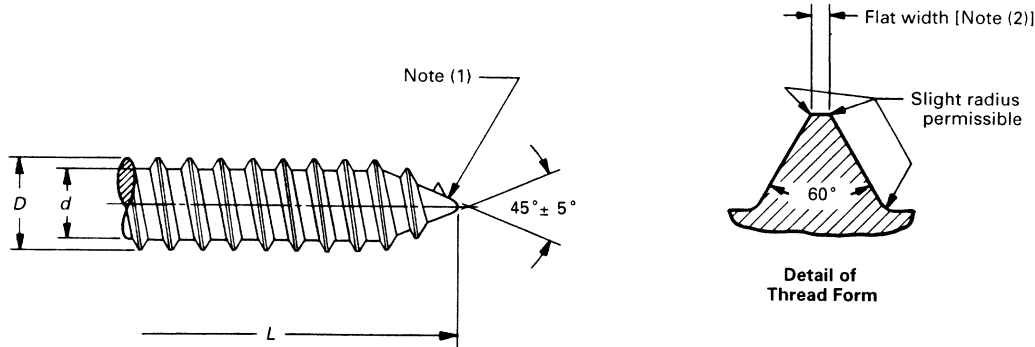
4.7 For approximate hole sizes for various materials, see ASME B18.6.4.

5. SUPPLIER RESPONSIBILITY

5.1 Suppliers shall perform the necessary tests for sample approval for initial lots. After this approval, Suppliers are not required to perform the specific test, but to ascertain that their product will conform to the specification limits. These specified requirements will be used to reconcile any disputed values.

5.2 All materials supplied to this specification shall be equivalent in all characteristics to the material upon which approval was originally granted. Prior to making of any changes in the properties, composition, construction, color, dimensions, processing, or labeling of the material originally approved under this specification, the Supplier shall notify Purchasing and the affected Materials/Standards Engineering activity of the proposed changes and obtain the written acknowledgement of the Materials/Standards Engineering activity. Test data, test samples, and a new identification code are to be submitted with the request.

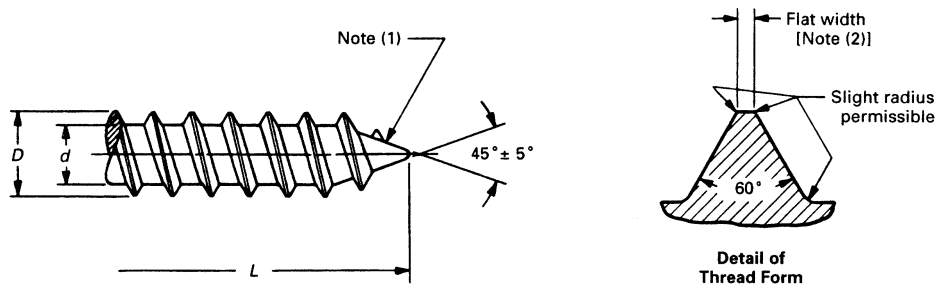
	NAME				PART NUMBER	
	STD STS FORM+CUT				86505618	
ENGINEERING SPECIFICATION				REV. L	FRAME 2	OF 31

Table 1: Type AB Thread Forming Screws

Nominal Size	Threads per Inch	Major Diameter (D)		Minor Diameter (d)		Min. Practical Nom. Screw Lengths (L)	
		Max	Min	Max	Min	90° Heads	Csk. Heads
#4 (.1120)	24	.114	.108	.086	.082	7/32	9/32
#6 (.1380)	20	.139	.132	.104	.099	9/32	11/32
#8 (.1640)	18	.166	.159	.122	.116	5/16	3/8
#10 (.1900)	16	.189	.182	.141	.135	3/8	7/16
#12 (.2160)	14	.215	.208	.164	.157	7/16	21/32
1/4 (.2500)	14	.246	.237	.192	.185	1/2	19/32
5/16 (.3125)	12	.315	.306	.244	.236	5/8	3/4
3/8 (.3750)	12	.380	.371	.309	.299	3/4	29/32

NOTES:

- (1) No extrusions of excess metal beyond apex of the point resulting from thread rolling shall be permissible. A slight rounding or truncation of the point is desirable.
- (2) The width of the flat at crest of thread shall not exceed 0.004 in. for sizes up to and including No. 8 and 0.006 in for larger sizes.

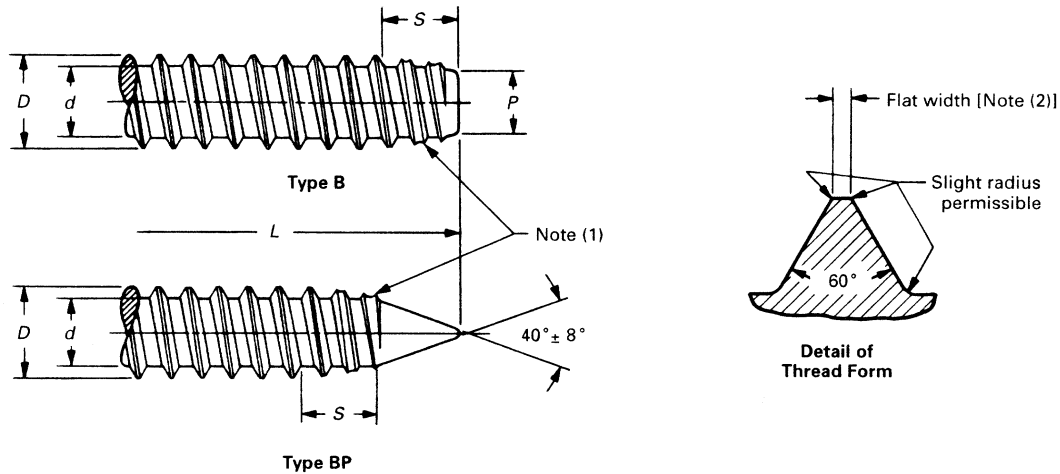
Table 2: Type A Thread Forming Screws (Not Recommended for New Designs—Use Type AB)

Nominal Size	Threads per Inch	Major Diameter (D)		Minor Diameter (d)		For These Lengths or Shorter, Use Type AB (L)	
		Max	Min	Max	Min	90° Heads	Csk. Heads
#4 (.1120)	24	.114	.110	.083	.078	3/16	1/4
#6 (.1380)	18	.141	.136	.102	.096	1/4	5/16
#8 (.1640)	15	.168	.162	.123	.116	3/8	7/16
#10 (.1900)	12	.194	.188	.133	.126	3/8	1/2
#12 (.2160)	11	.221	.215	.162	.155	7/16	9/16
#14 (.2420)	10	.254	.248	.185	.178	1/2	5/8
#16 (.2680)	10	.280	.274	.197	.189	9/16	3/4

NOTES:

- (1) No extrusions of excess metal beyond apex of the point resulting from thread rolling shall be permissible. A slight rounding or truncation of the point is desirable.
- (2) The width of the flat at crest of thread shall not exceed 0.004 in. for sizes up to and including No. 8 and 0.006 in for larger sizes.

 NEW HOLLAND	NAME				PART NUMBER	
	STD STS FORM+CUT				86505618	
ENGINEERING SPECIFICATION				REV. L	FRAME 4	OF 31

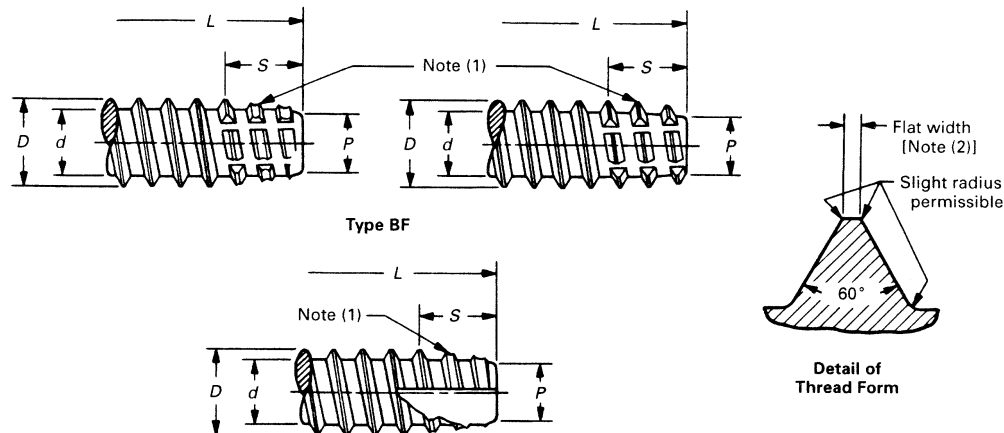
Table 3: Type B and BP Threading Forming Screws

Nominal Size	Threads per Inch	Major Diameter (D)		Minor Diameter (d)		Point Diameter Ref.	Point Taper Length (S)		Min. Practical Nom. Screw Lengths (L)			
		Max	Min	Max	Min		Max	Min	Type B		Type BP	
									90° Heads	Csk. Heads	90° Heads	Csk. Heads
#6 (.1380)	20	.139	.132	.104	.099	.095	.100	.075	1/4	9/32	3/8	7/16
#7 (.1510)	19	.154	.147	.115	.109	.105	.105	.079	1/4	5/16	13/32	12/32
#8 (.1640)	18	.166	.159	.122	.116	.112	.111	.083	9/32	11/32	7/16	1/2
#10 (.1900)	16	.189	.182	.141	.135	.130	.125	.094	5/16	3/8	1/2	19/32
1/4 (.2500)	14	.246	.237	.192	.185	.179	.143	.107	3/8	1/2	21/32	3/4
5/16 (.3125)	12	.315	.306	.244	.236	.230	.167	.125	15/32	19/32	27/32	31/32
3/8 (.3750)	12	.380	.371	.309	.299	.293	.167	.125	17/32	11/16	15/16	1 1/8

NOTES:

- (1) Threads within point taper length shall have unfinished crests.
- (2) The width of the flat at crest of thread shall not exceed .004 in. for sizes up to and including No. 8, and .006 for larger sizes.

	NAME				PART NUMBER	
	STD STS FORM+CUT				86505618	
ENGINEERING SPECIFICATION				REV. L	FRAME 5	OF 31

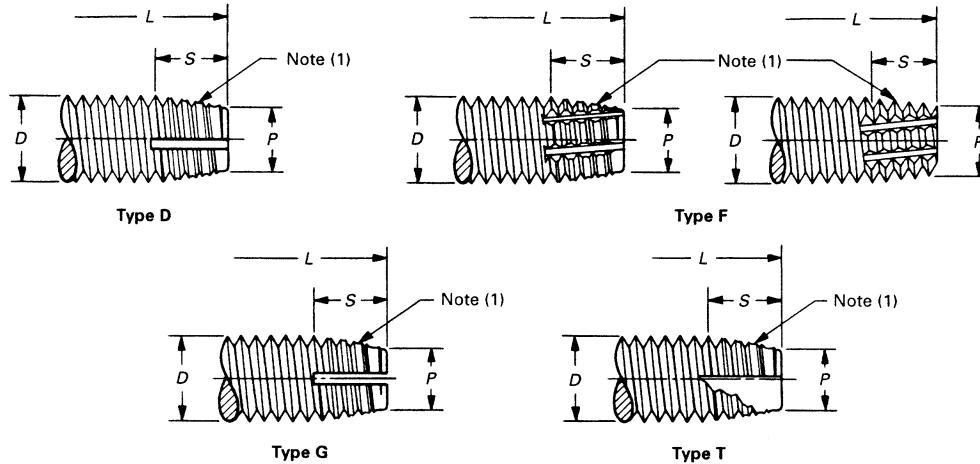
Table 4: Type BF and BT Thread Cutting Screws

Nominal Size	Threads per Inch	Major Diameter (D)		Minor Diameter (d)		Point Diameter (P)	Point Taper Length (S)		Min. Practical Nom. Screw Thread Lengths (L)	
		Max	Min	Max	Min	Ref.	Max	Min	90° Heads	Csk. Heads
#4 (.1120)	24	.114	.108	.086	.082	.079	.083	.063	3/16	1/4
#6 (.1380)	20	.139	.132	.104	.099	.095	.100	.075	1/4	9/32
#8 (.1640)	18	.166	.159	.122	.116	.112	.111	.083	9/32	11/32
#10 (.1900)	16	.189	.182	.141	.135	.130	.125	.094	5/16	3/8
1/4 (.2500)	14	.246	.237	.192	.185	.179	.143	.107	3/8	1/2
5/16 (.3125)	12	.315	.306	.244	.236	.230	.167	.125	15/32	19/32

NOTES:

- (1) Points of screws shall be tapered and fluted or slotted as illustrated above for the respective types. The flute on Type BT screws shall have an included angle of 90° to 95° and the thread cutting edge located above the axis of screw. Tapered threads shall have unfinished crests, and the flutes or slots shall extend through first full thread beyond taper except for type BF screws on which tapered threads may be complete at the manufacturer's option and flutes may be one pitch short of first full form thread. Other details of taper and flute design shall be optional with manufacturer provided the screws meet specified performance requirements.
- (2) The width of the flat at crest of thread shall not exceed .004 in. for sizes up to and including No. 8, and .006 for larger sizes.

	NAME				PART NUMBER	
	STD STS FORM+CUT				86505618	
ENGINEERING SPECIFICATION				REV. L	FRAME 6	OF 31

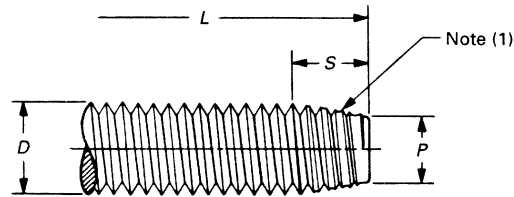
Table 5: Type D, F, G, and T Thread Cutting Screws

Nominal Size	Threads per Inch	Major Diameter (D)		Point Dia. (P)	Point Taper Length (S) (2)				Determinant Lengths for Point Taper (L)		Min. Practical Nom. Screw Lengths (L)	
					For Short Screws		For Long Screws					
		Max	Min	Ref	Max	Min	Max	Min	90° Heads	Csk. Heads	90° Heads	Csk. Heads
#4 (.112)	40	.1120	.1061	.087	.088	.062	.112	.088	7/32	1/4	3/16	1/4
#4 (.112)	48	.1120	.1068	.091	.073	.052	.094	.073	3/16	7/32	5/32	7/32
#6 (.1380)	32	.1380	.1312	.107	.109	.078	.141	.109	1/4	5/16	1/4	5/16
#6 (.1380)	40	.1380	.1321	.113	.088	.062	.112	.088	7/32	9/32	3/16	1/4
#8 (.1640)	32	.1640	.1571	.132	.109	.078	.141	.109	1/4	11/32	1/4	5/16
#8 (.1640)	36	.1640	.1577	.136	.097	.069	.125	.097	7/32	5/16	7/32	9/32
#10 (.1900)	24	.1900	.1818	.148	.146	.104	.188	.146	11/32	7/16	5/16	13/32
#10 (.1900)	32	.1900	.1831	.158	.109	.078	.141	.109	1/4	11/32	1/4	5/16
#12 (.2160)	24	.2160	.2078	.174	.146	.104	.188	.146	11/32	7/16	5/16	13/32
#12 (.2160)	28	.2160	.2085	.180	.125	.089	.161	.125	5/16	13/32	9/32	3/8
1/4 (.2500)	20	.2500	.2408	.200	.175	.125	.225	.175	13/32	17/32	3/8	1/2
1/4 (.2500)	28	.2500	.2425	.214	.125	.089	.161	.125	5/16	13/32	9/32	3/8
5/16 (.3125)	18	.3125	.3026	.257	.194	.139	.250	.194	15/32	19/32	7/16	9/16
5/16 (.3125)	24	.3125	.3042	.271	.146	.104	.188	.146	11/32	15/32	5/16	15/32
3/8 (.3750)	16	.3750	.3643	.312	.219	.156	.281	.219	1/2	11/16	15/32	5/6
3/8 (.3750)	24	.3750	.3667	.333	.146	.104	.188	.146	11/32	1/2	5/16	1/2

NOTES:

- (1) Points of screws shall be tapered and fluted or slotted as illustrated above for the respective types. The flute on Type T screws shall have an included angle of 90° to 95° and the thread cutting edge located above the axis of screw. Tapered threads shall have unfinished crests, and the flutes or slots shall extend through first full thread beyond taper except for type F screws on which tapered threads may be complete at the manufacturer's option and flutes may be one pitch short of first full form thread. Other details of taper and flute design shall be optional with manufacturer provided the screws meet specified performance requirements.
- (2) Screws of these nominal lengths and shorter shall have point taper lengths specified for short screws. Longer lengths shall have point taper lengths specified for long screws.

 NEW HOLLAND	NAME				PART NUMBER			
	STD STS FORM+CUT				86505618			
ENGINEERING SPECIFICATION				REV. L	FRAME 7	OF 31	 Documents Document Sharing Hub	

Table 6: Type C Thread Forming Screws (Not Recommended for New Designs)

Nominal Size	Threads per Inch	Major Diameter (D)		Point Dia. (P)	Point Taper Length (S)				Determinant Lengths for Point Taper (L)		Min. Practical Nominal Screw Lengths (L)	
					Short Screws		Long Screws					
		Max	Min	Ref	Max	Min	Max	Min	90° Heads	Csk Heads	90° Heads	Csk Heads
#4 (.1120)	40	.1120	.1061	.087	.088	.062	.112	.088	7/32	1/4	3/16	1/4
#4 (.1120)	48	.1120	.1068	.091	.073	.052	.094	.073	3/16	7/32	5/32	7/32
#6 (.1380)	32	.1380	.1312	.107	.109	.078	.141	.109	1/4	5/16	1/4	5/16
#6 (.1380)	40	.1380	.1321	.113	.088	.062	.112	.088	7/32	9/32	3/16	1/4
#8 (.1640)	32	.1640	.1571	.132	.109	.078	.141	.109	1/4	11/32	1/4	5/16
#8 (.1640)	36	.1640	.1577	.136	.097	.069	.125	.097	7/32	5/16	7/32	9/32
#10 (.1900)	24	.1900	.1818	.148	.146	.104	.188	.146	11/32	7/16	5/16	13/32
#10 (.1900)	32	.1900	.1831	.158	.109	.078	.141	.109	1/4	11/32	1/4	5/16
#12 (.2160)	24	.2160	.2078	.179	.146	.104	.188	.116	11/32	7/16	5/16	13/32
#12 (.2160)	28	.2160	.2085	.180	.125	.089	.161	.125	5/16	13/32	9/32	3/8
1/4 (.2500)	20	.2500	.2408	.200	.175	.125	.225	.175	13/32	17/32	3/8	1/2
1/4 (.2500)	28	.2500	.2425	.214	.125	.089	.161	.125	5/16	13/32	9/32	3/8
5/16 (.3125)	18	.3125	.3026	.257	.194	.139	.250	.194	15/32	19/32	7/16	9/16
5/16 (.3125)	24	.3125	.3042	.271	.146	.104	.188	.146	11/32	15/32	5/16	15/32
3/8 (.3750)	16	.3750	.3643	.312	.219	.156	.281	.219	1/2	11/16	15/32	5/8
3/8 (.3750)	24	.3750	.3667	.333	.146	.104	.188	.146	11/32	1/2	5/16	1/2



NAME

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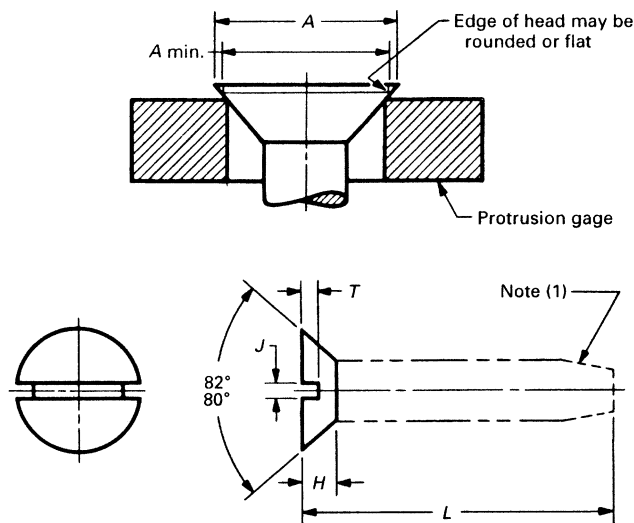
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31

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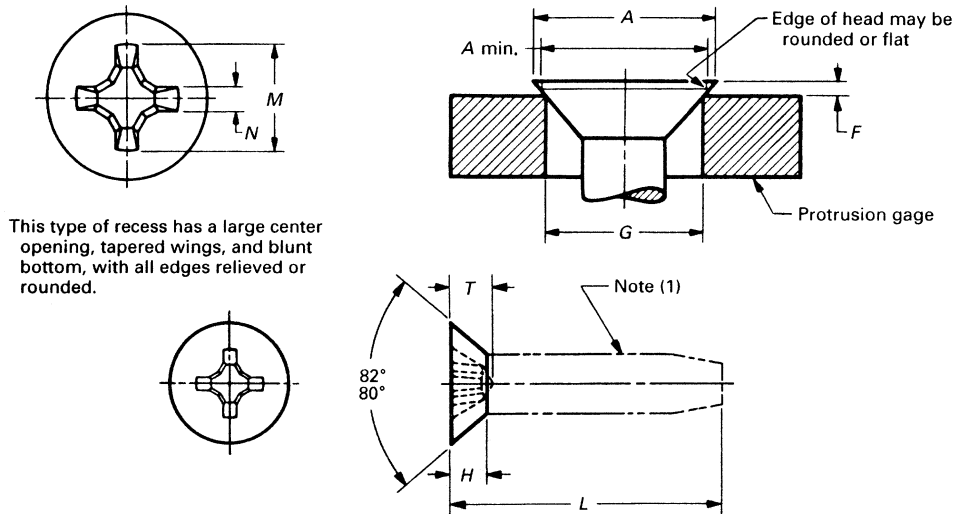
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Table 7: Slotted Flat Countersunk Head (Not Preferred)

Nominal Size	Applicable to Screw Types (1)	These Lengths or Shorter Are Undercut (L)		Head Diameter (A)		Head Height (H)	Slot Width (J)		Slot Depth (T)	
		Types AB & A	Other Types	Max	Min	Ref	Max	Min	Max	Min
#4 (.1120)	● ♦ ▲ ■	1/4	1/4	.212	.191	.067	.039	.031	.030	.020
#6 (.1380)	● ♦ ▲ ■	5/16	5/16	.262	.238	.083	.048	.039	.038	.024
#8 (.1640)	● ♦ ▲ ■	7/16	7/16	.312	.285	.100	.054	.045	.045	.029
#10 (.1900)	● ♦ ▲ ■	1/2	1/2	.362	.333	.116	.060	.050	.053	.034
#12 (.2160)	● ♦ ▲ ■	9/16	9/16	.412	.380	.132	.067	.067	.060	.039
1/4 (.2500)	● ▲ ■	5/8	5/8	.477	.442	.153	.075	.064	.070	.046
5/16 (.3125)	● ▲ ■	13/16	5/8	.597	.556	.191	.084	.072	.088	.058
3/8 (.3750)	▲ ■	—	5/8	.717	.670	.230	.094	.081	.106	.070
7/16 (.4375)	▲	—	3/4	.760	.715	.223	.094	.081	.103	.066

NOTES:

- (1) Applicable to screw types as indicated by code symbols below.
- Type AB thread forming
 - ♦ Type A thread forming, except short lengths
 - ▲ Types B and BP thread forming and BF and BT thread cutting
 - Type C thread forming and Types D, F, G, and T thread cutting

Table 8: Cross Recessed Flat Countersunk Head

Nominal Size	Applicable to Screw Types (1)	These Lengths or Shorter Are Undercut (L)		Head Diameter (A)		Head Height (H)	Recess Diameter (M)	Recess Depth (T)	Recess Width (N)	Drive Size	Recess Penetration Gaging Depth	
		Types AB & A	Other Types	Max	Min	Ref	Ref	Ref	Ref		Max	Min
#4 (.1120)	● ♦ ▲ ■	1/4	1/4	.212	.191	.067	.122	.081	.018	1	.082	.066
#6 (.1380)	● ♦ ▲ ■	5/16	5/16	.262	.238	.083	.168	.094	.029	3	.095	.072
#8 (.1640)	● ♦ ▲ ■	7/16	7/16	.312	.285	.100	.182	.110	.030	2	.110	.087
#10 (.1900)	● ♦ ▲ ■	1/2	1/2	.362	.333	.116	.198	.124	.032	2	.125	.102
#12 (.2160)	● ♦ ▲ ■	9/16	9/16	.412	.380	.132	.262	.144	.035	3	.139	.116
1/4 (.2500)	● ▲ ■	5/8	5/8	.477	.442	.153	.276	.160	.036	3	.154	.131
5/16 (.3125)	● ▲ ■	13/16	5/8	.597	.556	.191	.358	.205	.061	4	.196	.174
3/8 (.3750)	▲ ■	—	5/8	.717	.670	.230	.386	.234	.065	4	.225	.203
7/16 (.4375)	▲	—	3/4	.760	.715	.223	.402	.250	.068	4	.241	.219

NOTES:

- (1) Applicable to screw types as indicated by code symbols below.
- Type AB thread forming
 - ♦ Type A thread forming, except short lengths
 - ▲ Types B and BP thread forming and BF and BT thread cutting
 - Type C thread forming and Types D, F, G, and T thread cutting