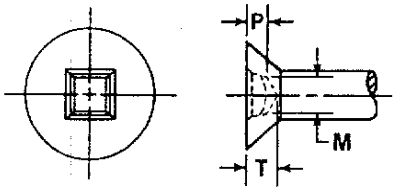
SQUARE RECESSED HEAD SCREWS

IFI Note:

1. ***Presented on pages I-36 thru I-39 are dimensional standards for square recessed head tapping, machine and wood screws. The square recess drive system (designated Type III) is very popular in Canada and has gained broad acceptance by industry in the United States. As yet, the Type III recess has not been recognized in American National Standards.***

TYPE III



This type of recess has a square center opening, slightly tapered side walls and a conical bottom.

Table 1 Dimensions of Square Recessed Flat Countersunk Head Tapping and Machine Screws

Nominal Size or Basic Screw Diameter		M		T		Driver Size	P	
		Recess Square		Recess Depth			Penetration Gaging Depth	
		Max	Min	Max	Min		Max	Min
3	0.0990	0.071	0.0696	0.073	0.063	0	0.038	0.032
4	0.1120	0.071	0.0696	0.073	0.063	0	0.038	0.032
5	0.1250	0.091	0.090	0.113	0.105	1	0.065	0.057
6	0.1380	0.091	0.090	0.113	0.105	1	0.065	0.057
7	0.1510	0.091	0.090	0.113	0.105	1	0.065	0.057
8	0.1640	0.1126	0.111	0.140	0.119	2	0.075	0.065
10	0.1900	0.1126	0.111	0.140	0.119	2	0.075	0.065
12	0.2160	0.133	0.1315	0.165	0.155	3	0.095	0.085
1/4	0.2500	0.133	0.1315	0.165	0.155	3	0.095	0.085
5/16	0.3125	0.191	0.1895	0.201	0.191	4	0.100	0.090
3/8	0.3750	0.191	0.1895	0.201	0.191	4	0.100	0.090
See Note 1, 2							3	

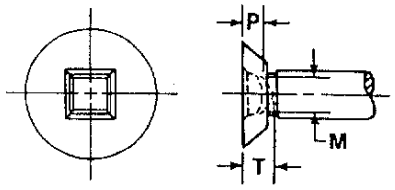
NOTES:

1. Where specifying nominal size in decimals, zeros preceding decimal and in the fourth decimal place shall be omitted.
2. Tapping screw head dimensions not shown are the same as those of slotted tapping screws, Table 9, page H-24. Machine screw head dimensions not shown are the same as those of slotted machine screws, Table 1, page I-6.
3. For penetration gaging, see Appdx. I, page I-39.
4. For additional requirements for tapping screws, see Introductory Notes and General Data, page H-11, and for machine screws, see page I-1.

Table 2 Dimensions of Square Recessed Undercut Flat Countersunk Head Tapping and Machine Screws

Nominal Size or Basic Screw Diameter		M		T		Driver Size	P	
		Recess Square		Recess Depth			Penetration Gaging Depth	
		Max	Min	Max	Min		Max	Min
6	0.1380	0.091	0.090	0.074	0.066	1	0.026	0.018
7	0.1510	0.091	0.090	0.074	0.066	1	0.026	0.018
8	0.1640	0.1126	0.111	0.096	0.086	2	0.037	0.027
10	0.1900	0.1126	0.111	0.096	0.086	2	0.037	0.027
12	0.2160	0.133	0.1315	0.142	0.132	3	0.072	0.062
1/4	0.2500	0.133	0.1315	0.142	0.132	3	0.072	0.062
5/16	0.3125	0.191	0.1895	0.201	0.191	4	0.100	0.090
3/8	0.3750	0.191	0.1895	0.201	0.191	4	0.100	0.090
See Note 1, 2							3	

TYPE III



This type of recess has a square center opening, slightly tapered side walls and a conical bottom.

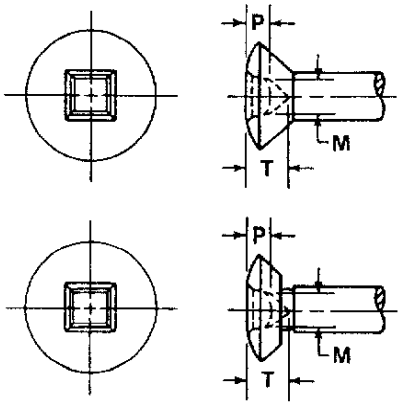
NOTES:

1. Where specifying nominal size in decimals, zeros preceding decimal and in the fourth decimal place shall be omitted.
2. Tapping screw head dimensions not shown are the same as those of slotted tapping screws, Table 11, page H-26. Machine screw head dimensions not shown are the same as those of slotted machine screws, Table 3, page I-8.
3. For penetration gaging, see Appdx. I, page I-39.
4. For additional requirements for tapping screws, see Introductory Notes and General Data, page H-11, and for machine screws, see page I-1.

Table 3 Dimensions of Square Recessed Oval Countersunk and Undercut Oval Countersunk Head Tapping and Machine Screws

Nominal Size or Basic Screw Diameter		M		T		Driver Size	P	
		Recess Square		Recess Depth			Penetration Gaging Depth	
		Max	Min	Max	Min		Max	Min
3	0.0990	0.071	0.0696	0.073	0.063	0	0.038	0.032
4	0.1120	0.071	0.0696	0.073	0.063	0	0.038	0.032
5	0.1250	0.091	0.090	0.113	0.105	1	0.065	0.057
6	0.1380	0.091	0.090	0.113	0.105	1	0.065	0.057
7	0.1510	0.091	0.090	0.113	0.105	1	0.065	0.057
8	0.1640	0.1126	0.111	0.140	0.119	2	0.075	0.065
10	0.1900	0.1126	0.111	0.140	0.119	2	0.075	0.065
12	0.2160	0.133	0.1315	0.165	0.155	3	0.095	0.085
1/4	0.2500	0.133	0.1315	0.165	0.155	3	0.095	0.085
5/16	0.3125	0.191	0.1895	0.201	0.191	4	0.100	0.090
3/8	0.3750	0.191	0.1895	0.201	0.191	4	0.100	0.090
See Note 1, 2							3	

TYPE III

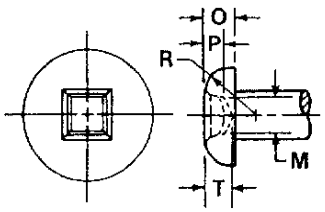


This type of recess has a square center opening, slightly tapered side walls and a conical bottom.

NOTES:

1. Where specifying nominal size in decimals, zeros preceding decimal and in the fourth decimal place shall be omitted.
2. Head dimensions of oval countersunk tapping screws not shown are the same as those of slotted tapping screws, Table 17, page H-32, and those of undercut oval countersunk tapping screws are the same as those of slotted tapping screws, Table 19, page H-34. Head dimensions of oval countersunk machine screws not shown are the same as those of slotted machine screws, Table 11, page I-16, and those of undercut oval countersunk machine screws are the same as those of slotted machine screws, Table 13, page I-18.
3. For penetration gaging, see Appdx. I, page I-39.
4. For additional requirements for tapping screws, see Introductory Notes and General Data, page H-11, and for machine screws, see page I-1.

TYPE III



This type of recess has a square center opening, slightly tapered side walls and a conical bottom.

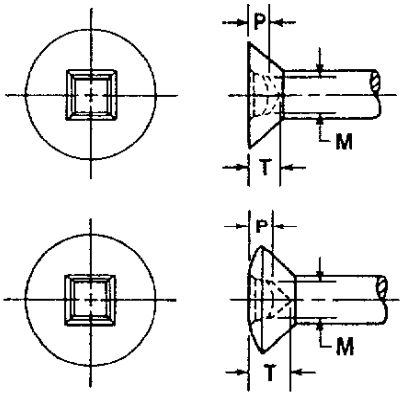
Table 4 Dimensions of Square Recessed Pan Head Tapping and Machine Screws

Nominal Size or Basic Screw Diameter		O		R	M		T		Driver Size	P	
		Head Height		Head Radius	Recess Square		Recess Depth			Penetration Gaging Depth	
		Max	Min	Min	Max	Min	Max	Min		Max	Min
3	0.0990	0.078	0.067	0.010	0.071	0.0696	0.073	0.063	0	0.038	0.032
4	0.1120	0.086	0.075	0.010	0.071	0.0696	0.073	0.063	0	0.038	0.032
5	0.1250	0.095	0.083	0.015	0.091	0.090	0.113	0.105	1	0.065	0.057
6	0.1380	0.103	0.091	0.015	0.091	0.090	0.113	0.105	1	0.065	0.057
7	0.1510	0.111	0.099	0.015	0.091	0.090	0.113	0.105	1	0.065	0.057
8	0.1640	0.120	0.107	0.015	0.1126	0.111	0.140	0.119	2	0.075	0.065
10	0.1900	0.137	0.123	0.020	0.1126	0.111	0.140	0.119	2	0.075	0.065
12	0.2160	0.153	0.139	0.025	0.133	0.1315	0.165	0.155	3	0.095	0.085
1/4	0.2500	0.175	0.160	0.035	0.133	0.1315	0.165	0.155	3	0.095	0.085
5/16	0.3125	0.216	0.198	0.040	0.191	0.1895	0.201	0.191	4	0.100	0.090
3/8	0.3750	0.256	0.237	0.040	0.191	0.1895	0.201	0.191	4	0.100	0.090
See Note 1, 2										3	

NOTES:

1. Where specifying nominal size in decimals, zeros preceding decimal and in the fourth decimal place shall be omitted.
2. Tapping screw head dimensions not shown are the same as those of slotted tapping screws, Table 23, page H-38. Machine screw head dimensions not shown are the same as those of slotted machine screws, Table 17, page I-22.
3. For penetration gaging, see Appdx. I, page I-39.
4. For additional requirements for tapping screws, see Introductory Notes and General Data, page H-11, and for machine screws, see page I-1.

TYPE III



This type of recess has a square center opening, slightly tapered side walls and a conical bottom.

Table 5 Dimensions of Square Recessed Flat Countersunk and Oval Countersunk Head Wood Screws

Nominal Size or Basic Screw Diameter		M		T		Driver Size	P	
		Recess Square		Recess Depth			Penetration Gaging Depth	
		Max	Min	Max	Min		Max	Min
3	0.099	0.071	0.0696	0.073	0.063	0	0.038	0.032
4	0.112	0.071	0.0696	0.073	0.063	0	0.038	0.032
5	0.125	0.091	0.090	0.113	0.105	1	0.065	0.057
6	0.138	0.091	0.090	0.113	0.105	1	0.065	0.057
7	0.151	0.091	0.090	0.113	0.105	1	0.065	0.057
8	0.164	0.1126	0.111	0.140	0.119	2	0.075	0.065
9	0.177	0.1126	0.111	0.140	0.119	2	0.075	0.065
10	0.190	0.1126	0.111	0.140	0.119	2	0.075	0.065
12	0.216	0.133	0.1315	0.165	0.155	3	0.095	0.085
14	0.242	0.133	0.1315	0.165	0.155	3	0.095	0.085
16	0.268	0.191	0.1895	0.201	0.191	4	0.100	0.090
18	0.294	0.191	0.1895	0.201	0.191	4	0.100	0.090
20	0.320	0.191	0.1895	0.201	0.191	4	0.100	0.090
24	0.372	0.191	0.1895	0.201	0.191	4	0.100	0.090
See Note 1							2	

NOTES:

1. Head dimensions of flat countersunk wood screws not shown are the same as those of slotted wood screws, Table 2, page J-36, and those of oval countersunk wood screws are the same as those of slotted wood screws, Table 4, page J-36.
2. For penetration gaging, see Appdx. I, page I-39.
3. For additional requirements see Introductory Notes and General Data, page J-32.

APPENDIX I
PENETRATION GAGING OF SQUARE RECESSED HEADS

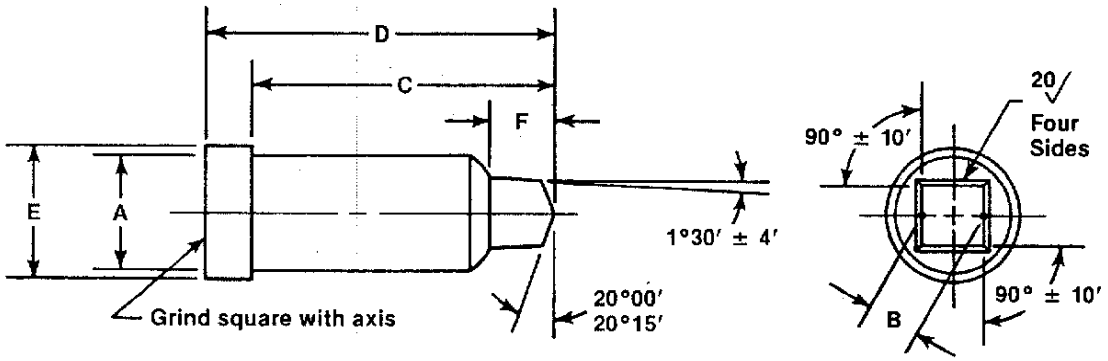
Penetration gaging is a test to determine the suitability of recesses in the heads of tapping, machine and wood screws and may be used to indicate deficiencies in the dimensions of the recesses specified in the dimensional tables. Penetrations which are too deep indicate the possibility of a thin section between head and shank of screw, a weakness which might result in twisting-off screw heads during tightening of the screws. Use of screws having shallow penetrations might result in production problems such as reaming of recesses or excessive wear on driver bits.

Penetration gaging depth values for square recessed heads (Type III) 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 III recess penetration depths with tabulated minimum limit reduced by up to 0.005 in., to be suitable for the gaging of screws having coating thickness of up to and including 0.0003 in. on significant surfaces.

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

Specified herein are dimensions of gage points to be used for penetration gaging Type III recesses. Gage points approach as nearly as possible the perfect driver form. Also specified are gage heads which adapt the gage points to standard dial gages. The same heads are used when gaging all types of recesses. (Gage heads for Type III recesses are the same as those for Types I and IA as given in Appdx. III, page H-48.)

Penetration is 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 of a flat head screw but is somewhat below the topmost portion of heads which have rounded top surfaces. Knife edges or tapered ridges on the gage head are used to establish the reference plane. A reverse reading dial gage is used to indicate the penetration of the gage point into the recess. The gage may be zeroed on any flat surface.



Dimensions of Gage Points for Type III Recess

Size of Recess Gage	A	B		C	D	E	F
	Point Dia	Width of Square		Length	Length	Dia	Point Length
	±0.0002	Max	Min	±0.008	±0.008	±0.005	+0.020 −0.000
0	0.1410	0.0688	0.0686	0.750	0.875	0.219	0.098
1	0.1410	0.0893	0.0891	0.750	0.875	0.219	0.098
2	0.2090	0.1103	0.1101	0.781	0.906	0.250	0.138
3	0.2090	0.1305	0.1303	0.781	0.906	0.250	0.138
4	0.3120	0.1879	0.1877	0.844	0.969	0.359	0.177