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U S A S T A N D A R D

Punches - Basic Head Type

USAS B94.14-1968

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Collaborator

National Association of Punch Manufacturers

Published by

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USA STANDARD

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UDC 621.952/957

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FOREWORD

This standard is the first of a series of interchangeable Punches and Accessories for Precision Stamping Dies.

This group of Punches is primarily intended for press fit mounting in precision stamping dies (also called permanent dies); that is, the dies built by die makers, within die sets, for long run production of specific and individual metal parts in many different kinds of punch presses.

In 1958, under the stimulus of a survey questioning from Dayton Chapter No. 18 of ASTME, several major punch manufacturers met for the first time during the ASTME Exposition in Philadelphia to discuss development of standards for the industry. Organized as a subcommittee of the Dayton Chapter Standards Committee, this group of manufacturers developed the predecessor of this standard. The proposed standard was submitted to the American Standards Association (now USA Standards Institute) for approval as an American Standard under the Existing Standards Method. Comments received, as a result of industry review, indicated that the proposed standard should be submitted by the Sectional Committee Method. Upon the request of the National Association of Punch Manufacturers, USA Standards Committee B94 on Cutting Tools, Holders, Drivers and Bushings accepted the project, and assigned it to Technical Committee No. 16 on Punches and Dies. The first meeting of Technical Committee 16 was held on April 23, 1964.

The members of NAPM have been the major contributors to the development of these standards in their committee work, their individual concessions to the general good, their intimate knowledge of the items standardized and their active efforts in promotion of adoption of the standards. User representatives on the committee have been uniquely effective in their concise presentation of application problems that so greatly contributed to the rapid progress of the committee.

NAPM standards referred to herein are a temporary device to coordinate industry conversion to the proposed standards without costly delays. References to the NAPM standards can eventually be discontinued.

The Basic Head Type Punches as submitted by the National Association of Punch Manufacturers was reviewed and revised by the committee; after its approval it was submitted to industry for review and comment.

Following approval by the USA Standards Committee B94 and the sponsor, the proposed was approved by the USA Standards Institute on January 12, 1968.

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PUNCHES, BASIC HEAD TYPE

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Table No.	NAPM Ref. No.	Type or Style of Punch	
1	11.000	Perforating, Round Solid	4
2	11.001	Punch Blank, Solid	5
3	11.002	Straight Punch, Solid	6
4	11.003	Pilot Punch	7
5	11.010	Perforating, Round Ejector	8
6	11.011	Punch Blank, Ejector	9
7	11.100	Perforating, Oblong, Solid	10
8	11.101	Perforating, Square Solid	11
9	11.102	Perforating, Rect., Solid	12
10	11.110	Perforating, Oblong, Ejector	13
11	11.111	Perforating, Square, Ejector	14
12	11.112	Perforating, Rect., Ejector	15

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USA STANDARD

Punches, Basic Head Type

1. Scope

This standard covers the USA Standard Practice for Basic Head Type Punches including dimensions, tolerances, nomenclature, sizes and shapes.

2. Nomenclature

2.1 Punch – The male force element of a stamping die that contacts the stock to perforate, bend, draw or shape the desired work piece. It generally consists of a working end and a retaining end.

2.1.1 Working End (Point) – The working end produces the desired hole, form or shape in the part. In the case of a perforating punch, the point shape is constant for a length to provide for passage thru the stock and for sharpening. The point shape is blended into the shank by a smooth radius (radii) tangent to the point shape to resist fatigue in transmitting the punching forces to the shank.

2.1.2 Retaining End (Shank) – The shank is generally cylindrical to fit a round hole in the punch retainer. The fit of the shank to the retainer hole provides location of the punch (relative to other punches, etc., in the stamping die). The forces applied to the punch are transmitted by the shank to the punch retainer and the retainer backing plate or punch holder. Several alternate devices are used to retain the punch in the punch retainer.

2.1.2.1 Head – This standard utilizes a cylindrical section, larger than the shank, which, by shoulder action, opposes the stripping force (opposite of punching force) and increases bearing area.

2.2 Types of Punches Included in this Standard

2.2.1 Perforating (Piercing) Punch – A punch to produce a hole. The point end is forced through the stock simultaneously producing a hole in the work piece and a waste slug. The hole will be the same shape as the end of the point.

2.2.2 Punch Blank – A punch with a single diameter for both shank and point with standard shank diameters and tolerances. They are intended for alteration for special diameters or point shapes.

2.2.3 Straight Punch – A perforating punch with a single diameter for both shank and point, with point diameter tolerance.

2.2.4 Pilot Punch – A punch, like a perforating punch, but with a bullet nose point end which enters a previously made hole to pick up and accurately locate the stock within the die.

2.2.5 Ejector Punch – A punch intended for mechanical or pneumatic separating of the waste slug from the end of the punch point to prevent slug being pulled back out of the die cavity. Ejector components to be manufacturer's option.

2.3 Punch Feature Nomenclature

2.3.1 Point Diameter (P) – The diameter of the working end of a round perforating punch or pilot punch or the distance across the flats of a square perforating punch.

2.3.2 Point Dimensions – The dimensions required to define the end shape of a punch point other than round or square.
"P" – the larger dimension of a point shape.
"W" – the smaller dimension of a point shape.

2.3.3 Point Length (B) – The length of the working end of a punch point including allowances for:

1. Penetration into the work piece
2. Grind or wear length (life) – extra length to be reduced by sharpening grinds (0.003 – 0.025 each)

2.3.4 Radius Blend (R) – A smooth radius, tangent to point shape, to blend the point (round or other shape) to the cylindrical shank (generally larger than the point).

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2.3.5 *Shank Diameter (D)* – The cylindrical portion of the retaining end that fits to a hole in the punch retainer as either:

2.3.5.1 *Press Fit* – The shank is larger than the retainer hole to produce a rigid joint. Installation and replacement requires pressure or impact to remove the punch.

2.3.5.2 *Slip Fit* – The shank is smaller than the retainer hole. Replacement should not require pressure or impact to remove the punch.

2.3.6 *Head Diameter (H)* – The diameter of a cylindrical head or the largest diameter of a conical head.

2.3.7 *Head Thickness (T)* – The thickness (length) of a head.

2.3.8 *Overall Length (L)* – The total length of a punch.

2.3.9 *Lead Diameter* – (Press-in Lead, Pilot Lead) – the portion of a press fit shank diameter (adjacent to the radius blend) which is smaller than the retainer hole to allow primary entry and piloting during assembly.

2.3.10 *Fillet* – The blend of shank diameter to head diameter to avoid stress concentration of a sharp corner.

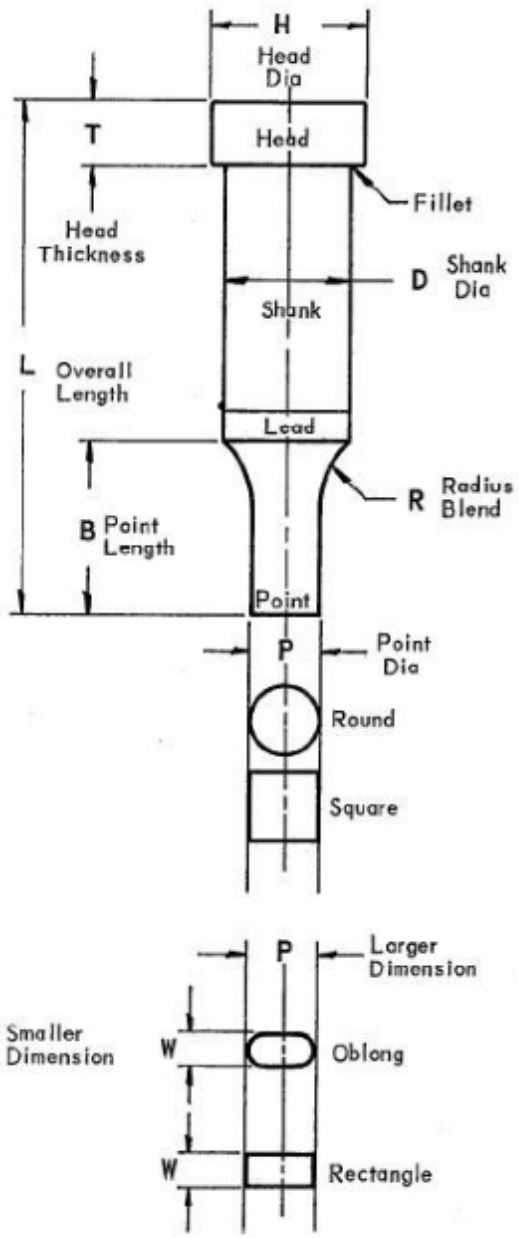
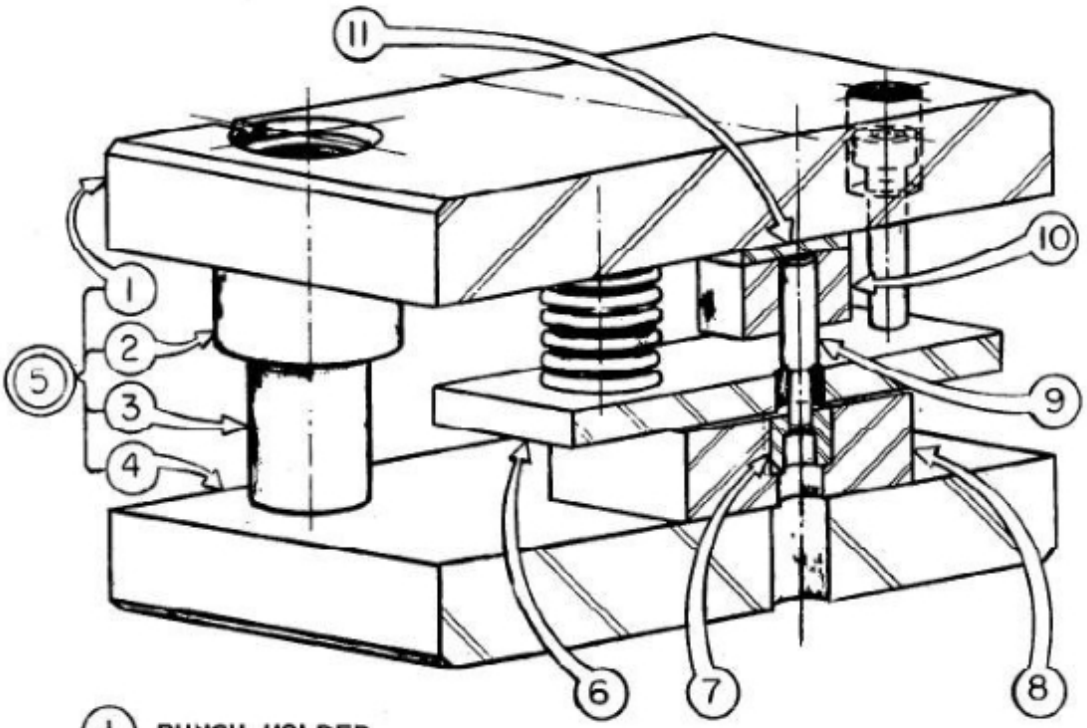


Fig. 1 Illustration of Basic Head Type Punch

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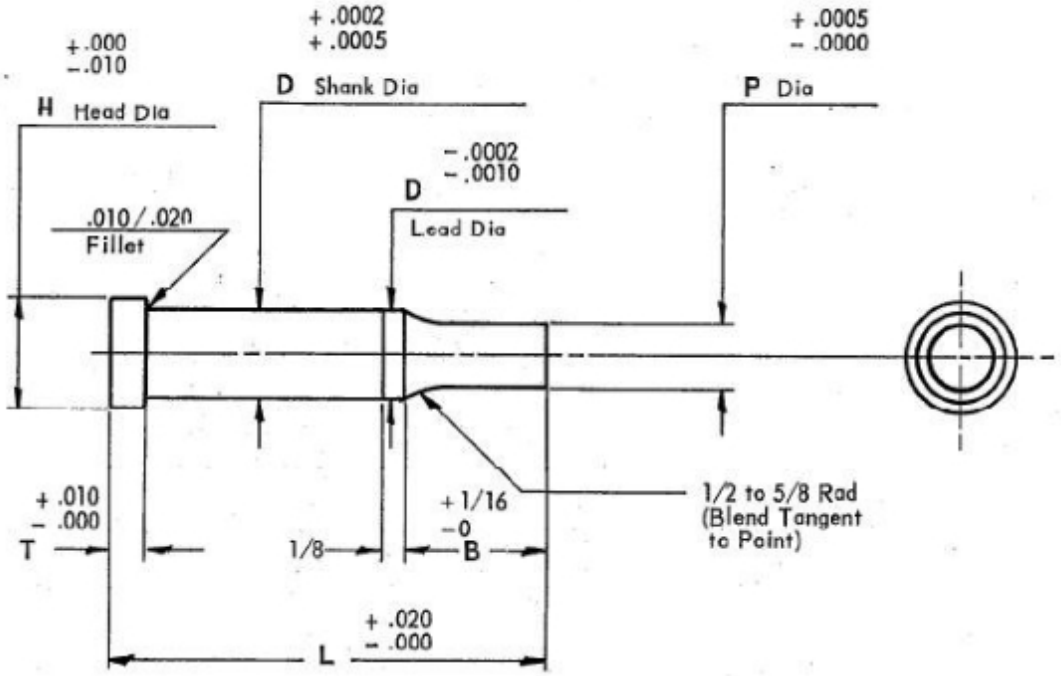
1. PUNCH HOLDER
2. GUIDE POST BUSHING
3. GUIDE POST
4. DIE HOLDER
5. DIE SET
6. STRIPPER PAD
7. DIE BUTTON
8. DIE BLOCK OR RETAINER
9. PERFORATING (PIERCING) PUNCH
10. PUNCH RETAINER
11. RETAINER BACKING PLATE

Fig. 2

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USA STANDARD

Table No. 1 BASIC HEAD TYPE PERFORATING PUNCH, ROUND NAPM 11.000 (Ref.)



Material: Tool Steel

Hardness: Point and Shank Rc 60–63
Head Rc 40–55

Concentricity: Point–Shank (P:D) 0.0005 T.I.R. (Max)

Taper: (Point *P*) 0.001/inch Max Backtaper Only (Point End Large)

Shank: Foretaper Only (Head End Large) – Both Ends to be within Dia Tolerances

Nominal Shank Dia *D*	Range of Point Dia *P*	Point Lg *B*	Head Dia *H*	Head Thk *T*	Overall Lengths *L*								
3/16 (0.1875)	0.062-0.186	7/16	5/16	1/8	1½	1¾	2	2¼	2½				
¼ (0.250)	0.062-0.249	½	⅜	⅛	1½	1¾	2	2¼	2½				
5/16 (0.3125)	0.093-0.311	9/16	7/16	⅛	1½	1¾	2	2¼	2½	2¾	3		
⅜ (0.375)	0.125-0.374	⅝	½	3/16		1¾	2	2¼	2½	2¾	3		
½ (0.500)	0.187-0.499	13/16	⅝	3/16			2	2¼	2½	2¾	3	3½	
⅝ (0.625)	0.375-0.624	15/16	¾	¼			2	2¼	2½	2¾	3	3½	
¾ (0.750)	0.500-0.749	1 1/16	⅞	¼				2¼	2½	2¾	3	3½	4
1 (1.000)	0.750-0.999	1¼	1⅛	¼					2½	2¾	3	3½	4

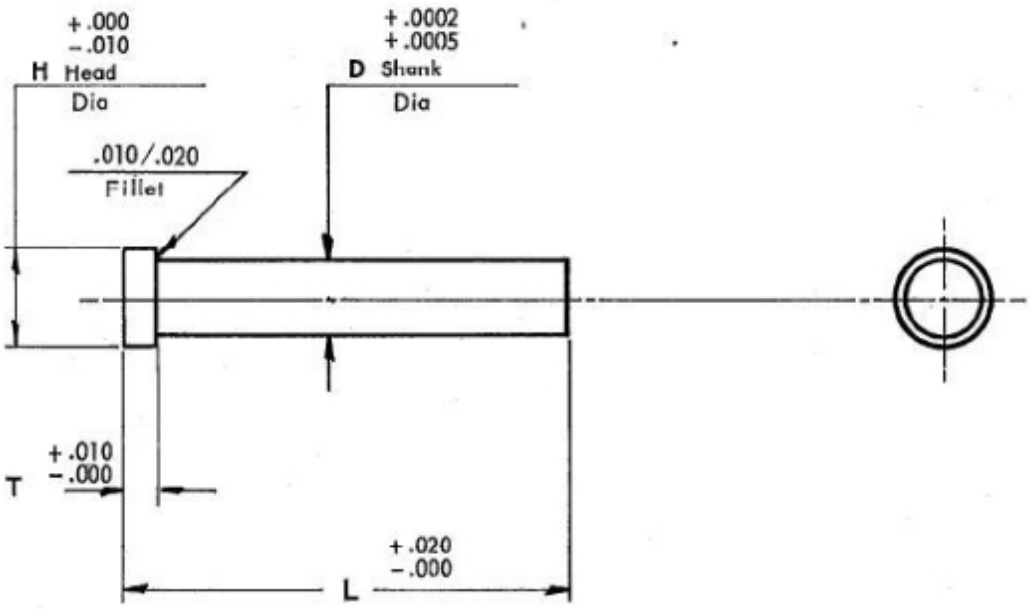
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PUNCHES – BASIC HEAD TYPE

Table No. 2 **BASIC HEAD TYPE PUNCH BLANK, ROUND** NAPM 11.001 (Ref.)

POINT EQUALS SHANK



Material: Tool Steel

Hardness: Shank Rc 60–63
Head Rc 40–55

Shank: Foretaper Only (Head End Large)
Both Ends to be within Dia Tolerances

Nominal Shank Dia *D*	Head		Overall Lengths *L*								
	Dia *H*	Thk *T*									
3/16 (0.1875)	5/16	1/8	1 1/2	1 3/4	2	2 1/4	2 1/2				
1/4 (0.250)	3/8	1/8	1 1/2	1 3/4	2	2 1/4	2 1/2				
5/16 (0.3125)	7/16	1/8	1 1/2	1 3/4	2	2 1/4	2 1/2	2 3/4	3		
3/8 (0.375)	1/2	5/16		1 3/4	2	2 1/4	2 1/2	2 3/4	3		
1/2 (0.500)	5/8	5/16			2	2 1/4	2 1/2	2 3/4	3	3 1/2	
5/8 (0.625)	3/4	1/4			2	2 1/4	2 1/2	2 3/4	3	3 1/2	
3/4 (0.750)	7/8	1/4				2 1/4	2 1/2	2 3/4	3	3 1/2	4
1 (1.000)	1 1/8	1/4					2 1/2	2 3/4	3	3 1/2	4

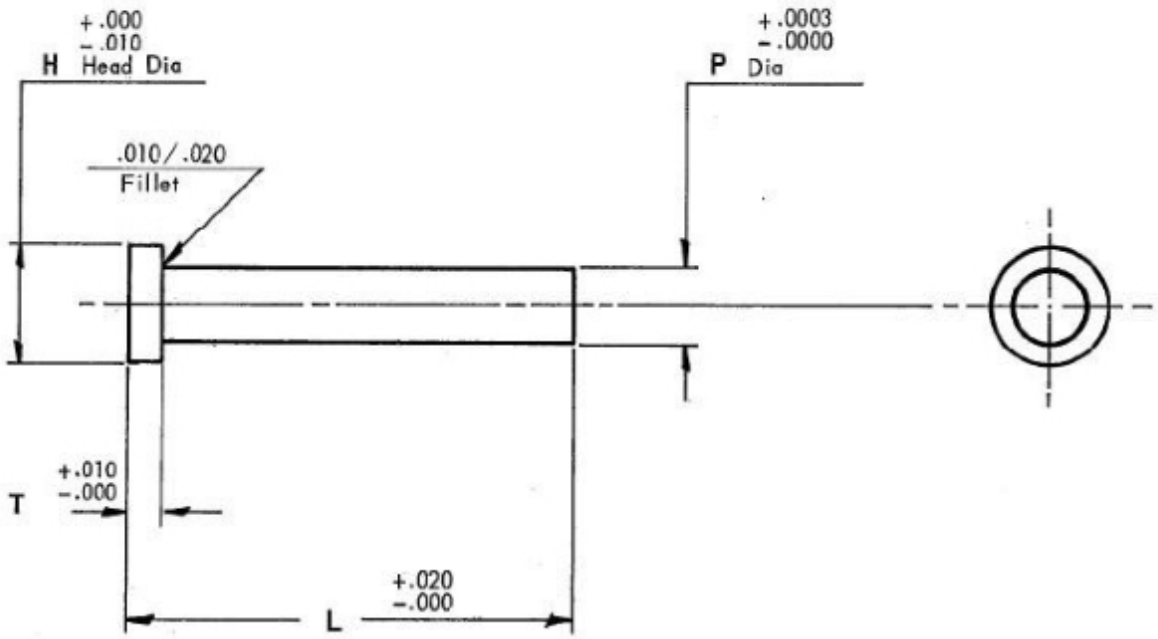
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USA STANDARD

Table No. 3 BASIC HEAD TYPE PERFORATING PUNCH, ROUND STRAIGHT NAPM 11.002 (Ref.)

SHANK EQUALS POINT



Material: Tool Steel

Hardness: Body Rc 60–63
Head Rc 40–55

Body: Foretaper Only (Head End Large)
Both Ends to be within Dia Tolerances

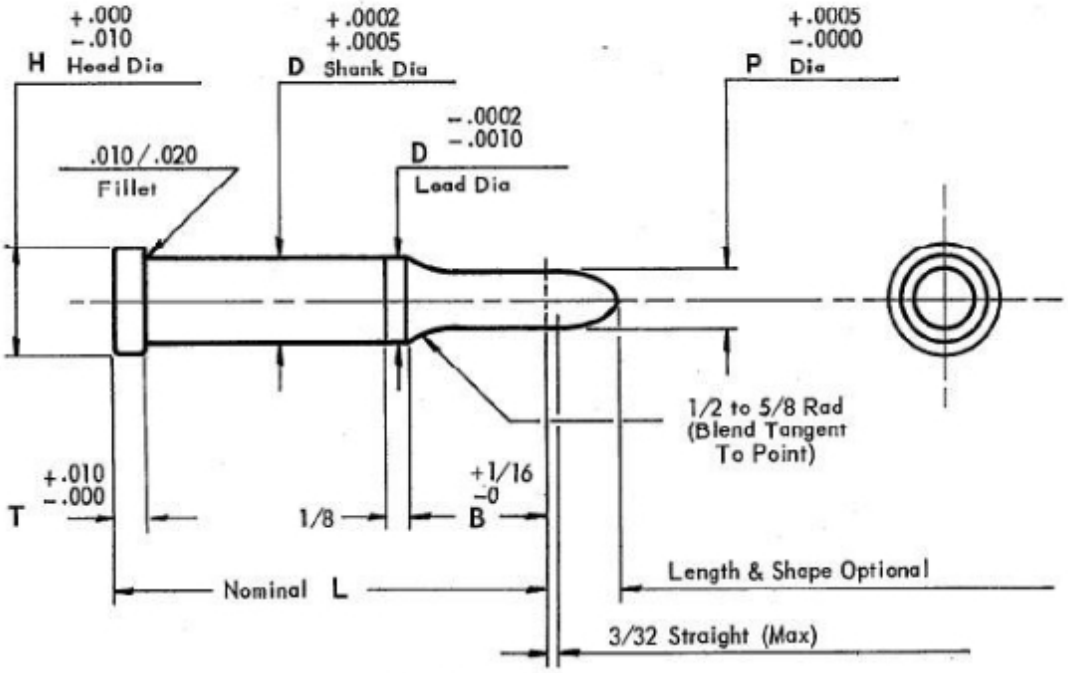
Range of Body Dia *P*	Head		Overall Lengths *L*								
	Dia *H*	Thk *T*									
0.125 – 0.187	5/16	1/8	1 1/2	1 3/4	2	2 1/4	2 1/2				
0.188 – 0.249	3/8	1/4	1 1/2	1 3/4	2	2 1/4	2 1/2				
0.251 – 0.312	7/16	1/4	1 1/2	1 3/4	2	2 1/4	2 1/2	2 3/4	3		
0.313 – 0.374	1/2	5/16		1 3/4	2	2 1/4	2 1/2	2 3/4	3		
0.376 – 0.499	5/8	5/16			2	2 1/4	2 1/2	2 3/4	3	3 1/2	
0.501 – 0.624	3/4	1/4			2	2 1/4	2 1/2	2 3/4	3	3 1/2	

All dimensions are given in inches.

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PUNCHES – BASIC HEAD TYPE

Table No. 4 **BASIC HEAD TYPE PILOT PUNCH, ROUND** NAPM 11.003 (Ref.)



Nominal L Same as Overall Punch Lengths

Material: Tool Steel

Hardness: Point and Shank Rc 60–63
Head Rc 40–55

Concentricity: Point–Shank (P:D) 0.0005 T.I.R. (Max)

Taper: (Point *P*) 0.0005/inch Max
Backtaper Only
(Point End Large)

Shank: Foretaper Only (Head End Large) – Both Ends to be within Dia Tolerances

Nominal Shank Dia *D*	Range of Point Dia *P*	Point Lg *B*	Head		Nominal L *L*								
			Dia *H*	Thk *T*									
3/16 (0.1875)	0.092-0.186	7/16	5/16	1/8	1½	1¾	2	2¼	2½				
1/4 (0.250)	0.092-0.249	1/2	3/8	1/8	1½	1¾	2	2¼	2½				
5/16 (0.3125)	0.092-0.311	9/16	7/16	1/8	1½	1¾	2	2¼	2½	2¾	3		
3/8 (0.375)	0.124-0.374	5/8	1/2	3/16		1¾	2	2¼	2½	2¾	3		
1/2 (0.500)	0.186-0.499	13/16	5/8	3/16			2	2¼	2½	2¾	3	3½	
5/8 (0.625)	0.374-0.624	15/16	3/4	1/4			2	2¼	2½	2¾	3	3½	
3/4 (0.750)	0.499-0.749	1 1/16	7/8	1/4				2¼	2½	2¾	3	3½	4
1 (1.000)	0.749-0.999	1 1/4	1 1/8	1/4					2½	2¾	3	3½	4

All dimensions are given in inches.

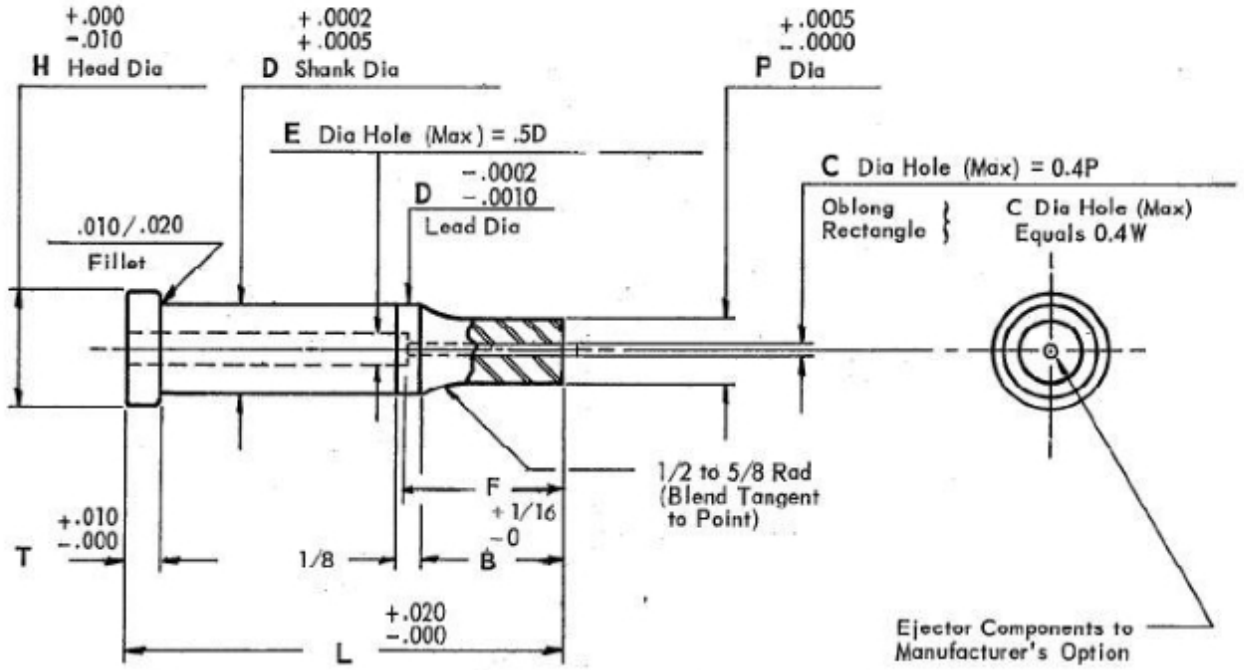
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USA STANDARD

BASIC HEAD TYPE PERFORATING EJECTOR PUNCH, ROUND

Table No. 5

NAPM 11.010 (Ref.)



Material: Tool Steel

Hardness: Point and Shank Rc 60–63
Head Rc 40–55

Concentricity: Point–Shank (P:D) 0.0005 T.I.R. (Max)

Taper: (Point *P*) 0.001/inch Max. Backtaper Only (Point End Large)

Shank: Foretaper Only (Head End Large) – Both Ends to be within Dia Tolerances

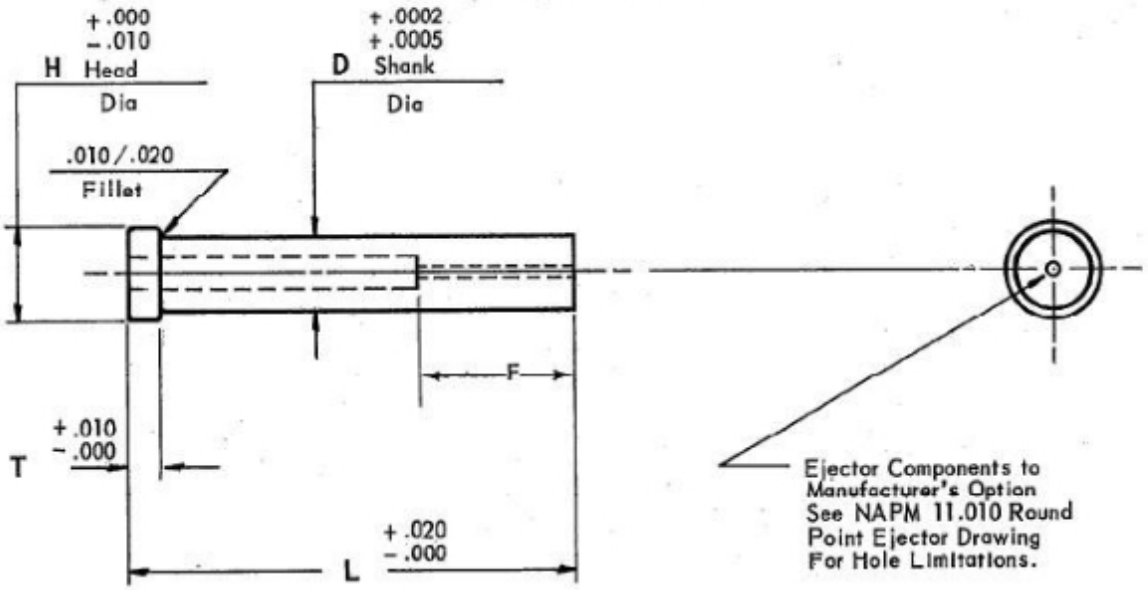
Nominal Shank Dia *D*	Range of Point Dia *P*	Point Lg *B*	C bore Dim *F* (Min)	Head		Overall Lengths *L*							
				Dia *H*	Thk *T*								
3/16 (0.1875)	0.062-0.186	7/16	15/32	5/16	1/8	1½	1¾	2	2¼	2½			
1/4 (0.250)	0.093-0.249	1/2	17/32	3/8	1/8	1½	1¾	2	2¼	2½			
5/16 (0.3125)	0.125-0.311	9/16	19/32	7/16	1/8	1½	1¾	2	2¼	2½	2¾	3	
3/8 (0.375)	0.187-0.374	5/8	21/32	1/2	3/16		1¾	2	2¼	2½	2¾	3	
1/2 (0.500)	0.250-0.499	13/16	27/32	5/8	1/4			2	2¼	2½	2¾	3	3½
5/8 (0.625)	0.375-0.624	15/16	31/32	3/4	1/4			2	2¼	2½	2¾	3	3½
3/4 (0.750)	0.500-0.749	1 1/16	1 3/32	7/8	1/4				2¼	2½	2¾	3	3½	4
1 (1.000)	0.750-0.999	1 1/2	1 9/32	1 1/8	1/4					2½	2¾	3	3½	4

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Table No. 6 BASIC HEAD TYPE EJECTOR PUNCH BLANK, ROUND NAPM 11.011 (Ref.)

POINT EQUALS SHANK



Material: Tool Steel

Hardness: Shank Rc 60–63
Head Rc 40–55

Shank: Foretaper Only (Head End Large)
Both Ends to be within Dia Tolerances

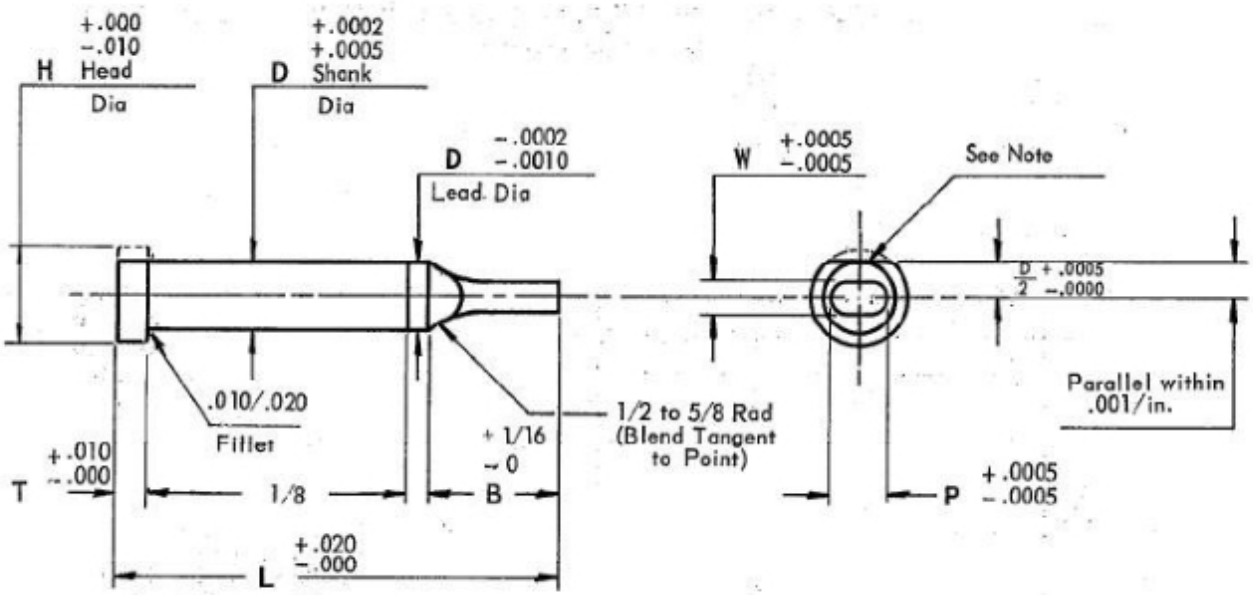
Nominal Shank Dia *D*	C bore Dim *F* (Min)	Head		Overall Lengths *L*								
		Dia *H*	Thk *T*									
5/16 (0.1875)	15/32	5/16	1/8	1 1/2	1 3/4	2	2 1/4	2 1/2				
1/4 (0.250)	17/32	3/8	1/8	1 1/2	1 3/4	2	2 1/4	2 1/2				
5/16 (0.3125)	19/32	7/16	1/8	1 1/2	1 3/4	2	2 1/4	2 1/2	2 3/4	3		
3/8 (0.375)	21/32	1/2	3/16		1 3/4	2	2 1/4	2 1/2	2 3/4	3		
1/2 (0.500)	27/32	5/8	3/16			2	2 1/4	2 1/2	2 3/4	3	3 1/2	
5/8 (0.625)	1 3/32	3/4	1/4			2	2 1/4	2 1/2	2 3/4	3	3 1/2	
3/4 (0.750)	1 3/32	7/8	1/4				2 1/4	2 1/2	2 3/4	3	3 1/2	4
1 (1.000)	1 9/32	1 1/8	1/4					2 1/2	2 3/4	3	3 1/2	4

All dimensions are given in inches.

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USA STANDARD

Table No. 7 BASIC HEAD TYPE PERFORATING PUNCH, OBLONG NAPM 11.100 (Ref.)



Material: Tool Steel

Hardness: Point and Shank Rc 60–63
Head Rc 40–55

Concentricity: Point–Shank (P:D) 0.001 T.I.R. (Max)

Taper: (Point $P \times W$)
0.001/inch Max. Backtaper Only
(Point End Large)

Shank: Foretaper Only (Head End Large) – Both Ends to be within Dia Tolerances

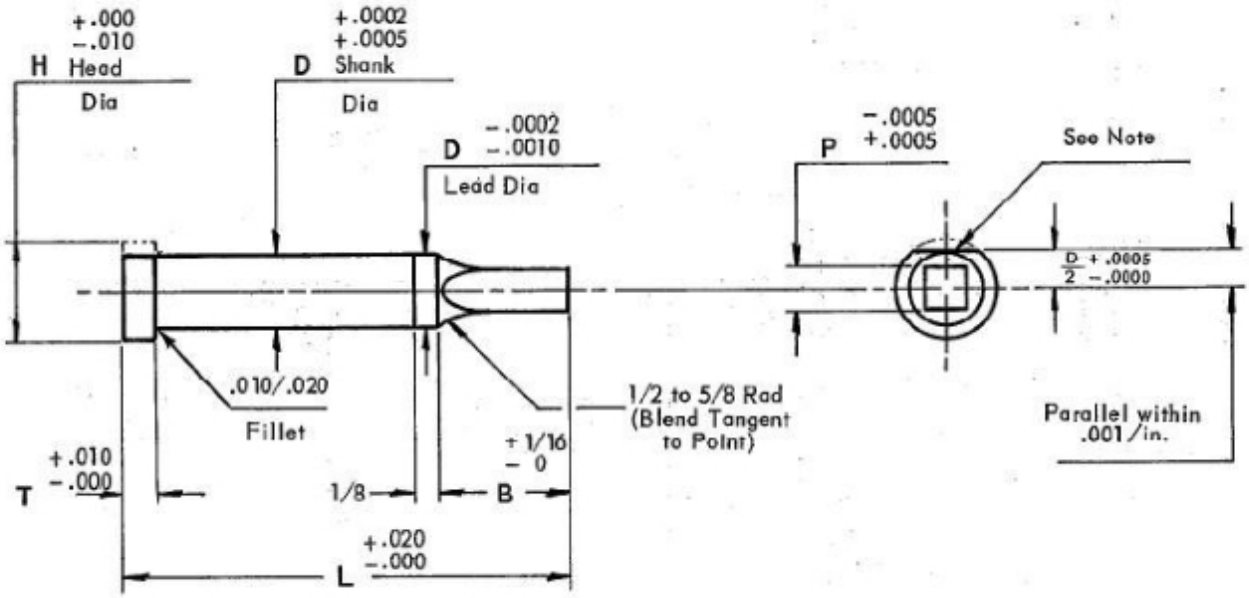
Nominal Shank Dia D	Range of Point Sizes P	Range of Point Sizes W	Point Lg B	Head Dia H	Head Thk T	Overall Lengths L								
3/16 (0.1875)	0.078-0.186	0.062-0.171	7/16	5/16	1/8	1 1/2	1 3/4	2	2 1/4	2 1/2				
1/4 (0.250)	0.078-0.249	0.062-0.234	1/2	3/8	1/8	1 1/2	1 3/4	2	2 1/4	2 1/2				
5/16 (0.3125)	0.109-0.311	0.093-0.296	9/16	7/16	1/4	1 1/2	1 3/4	2	2 1/4	2 1/2	2 3/4	3		
3/8 (0.375)	0.141-0.374	0.125-0.359	5/8	1/2	3/16		1 3/4	2	2 1/4	2 1/2	2 3/4	3		
1/2 (0.500)	0.203-0.499	0.187-0.484	13/16	5/8	3/16			2	2 1/4	2 1/2	2 3/4	3	3 1/2	
5/8 (0.625)	0.266-0.624	0.250-0.609	15/16	3/4	1/4			2	2 1/4	2 1/2	2 3/4	3	3 1/2	
3/4 (0.750)	0.328-0.749	0.312-0.734	1 1/16	7/8	1/4				2 1/4	2 1/2	2 3/4	3	3 1/2	4
1 (1.000)	0.390-0.999	0.375-0.984	1 1/4	1 1/8	1/4					2 1/2	2 3/4	3	3 1/2	4

All dimensions are given in inches.

NOTE: Keying Flat to be optional with user and/or manufacturer. If "Standard Key Flat" is specified, it is to be as shown.

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Table No. 8 BASIC HEAD TYPE PERFORATING PUNCH, SQUARE NAPM 11.101 (Ref.)



Material: Tool Steel

Hardness: Point and Shank Rc 60–63
Head Rc 40–55

Concentricity: Point–Shank (P:D) 0.001 T.I.R. (Max)

Taper: (Point *P*)
0.001/inch Max Backtaper Only
(Point End Large)

Shank: Foretaper Only (Head End Large) – Both Ends to be within Dia Tolerances

Nominal Shank Dia *D*	Range of Point Size *P*	Point Lg *B*	Head		Overall Lengths *L*								
			Dia *H*	Thk *T*									
3/16 (0.1875)	0.062-0.131	7/16	5/16	1/8	1½	1¾	2	2¼	2½				
1/4 (0.250)	0.078-0.176	1/2	3/8	1/8	1½	1¾	2	2¼	2½				
5/16 (0.3125)	0.093-0.220	7/16	7/16	1/8	1½	1¾	2	2¼	2½	2¾	3		
3/8 (0.375)	0.125-0.265	3/4	1/2	3/16		1¾	2	2¼	2½	2¾	3		
1/2 (0.500)	0.187-0.353	11/16	5/8	3/16			2	2¼	2½	2¾	3	3½	
5/8 (0.625)	0.250-0.441	15/16	3/4	1/4			2	2¼	2½	2¾	3	3½	
3/4 (0.750)	0.312-0.530	1 1/16	7/8	1/4				2¼	2½	2¾	3	3½	4
1 (1.000)	0.437-0.706	1 1/4	1 1/8	1/4					2½	2¾	3	3½	4

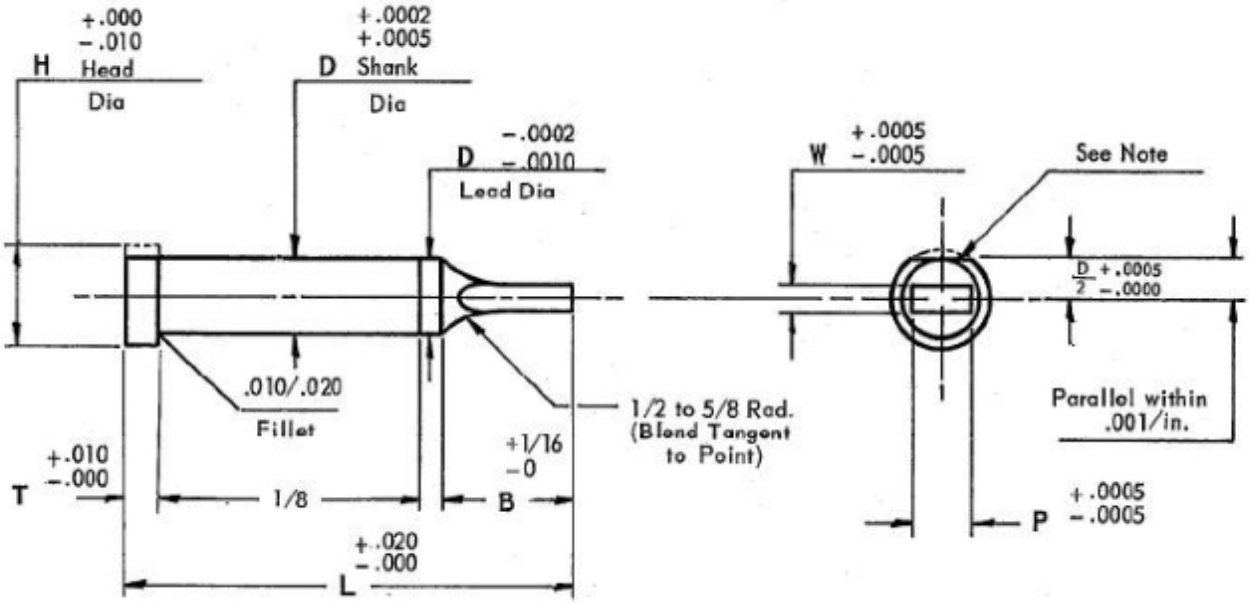
All dimensions are given in inches.

NOTE: Keying Flat to be optional with user and/or manufacturer. If "Standard Key Flat" is specified, it is to be as shown.

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USA STANDARD

Table No. 9 **BASIC HEAD TYPE PERFORATING PUNCH, RECTANGLE** NAPM 11.102 (Ref.)



Material: Tool Steel

Hardness: Point and Shank Rc 60–63
Head Rc 40–55

Concentricity: Point–Shank (PtD) 0.001 T.I.R. (Max)

Taper: (Point $P \times W$)
0.001/inch Max Backtaper Only
(Point End Large)

Shank: Foretaper Only (Head End Large) – Both Ends to be within Dia Tolerances

Nominal Shank Dia	Range of Point Sizes		Point Lg	Head		Overall Lengths L							
D	P	W	B	Dia H	Thk T								
3/16 (0.1875)	0.078-0.141	0.062-0.119	7/16	5/16	1/8	1 1/2	1 3/4	2	2 1/4	2 1/2			
1/4 (0.250)	0.078-0.208	0.062-0.130	1/2	3/8	1/8	1 1/2	1 3/4	2	2 1/4	2 1/2			
5/16 (0.3125)	0.109-0.250	0.093-0.175	9/16	7/16	1/8	1 1/2	1 3/4	2	2 1/4	2 1/2	2 3/4	3	
3/8 (0.375)	0.141-0.282	0.125-0.242	5/8	1/2	3/16		1 3/4	2	2 1/4	2 1/2	2 3/4	3	
1/2 (0.500)	0.203-0.375	0.187-0.324	13/16	5/8	3/16			2	2 1/4	2 1/2	2 3/4	3	3 1/2
5/8 (0.625)	0.266-0.500	0.250-0.367	15/16	3/4	1/4			2	2 1/4	2 1/2	2 3/4	3	3 1/2
3/4 (0.750)	0.328-0.625	0.312-0.411	1 1/16	7/8	1/4				2 1/4	2 1/2	2 3/4	3	3 1/2	4
1 (1.000)	0.390-0.875	0.375-0.480	1 1/4	1 1/8	1/4					2 1/2	2 3/4	3	3 1/2	4

All dimensions are given in inches.

NOTE: Keying Flat to be optional with user and/or manufacturer. If "Standard Key Flat" is specified, it is to be as shown.

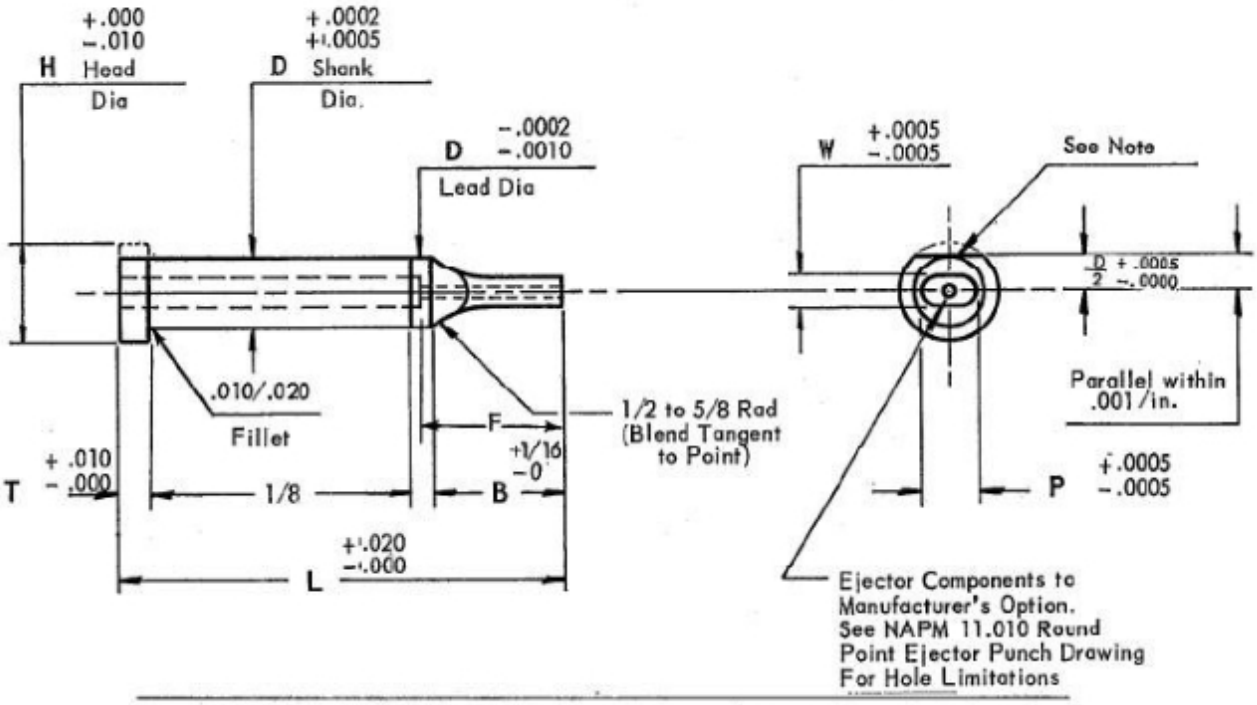
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PUNCHES – BASIC HEAD TYPE

Table No. 10

BASIC HEAD TYPE PERFORATING EJECTOR PUNCH, OBLONG

NAPM 11.110 (Ref.)



Material: Tool Steel

Hardness: Point and Shank Rc 60–63
Head Rc 40–55

Concentricity: Point–Shank (P:D) 0.001 T.I.R. (Max)

Taper: (Point $P \times W$)
0.001/inch Max Backtaper Only
(Point End Large)

Shank: Foretaper Only (Head End Large) – Both Ends to be within Dia Tolerances

Nominal Shank Dia D	Range of Point Sizes P	W	Point Lg B	C'bore Dim F (Min)	Head Dia H	Head Thk T	Overall Lengths L								
3/16 (0.1875)	0.078-0.186	0.062-0.171	7/16	15/32	5/16	1/8	1½	1¾	2	2¼	2½				
1/4 (0.250)	0.109-0.249	0.093-0.234	1/2	17/32	3/8	1/8	1½	1¾	2	2¼	2½				
5/16 (0.3125)	0.141-0.311	0.125-0.296	9/16	19/32	7/16	1/4	1½	1¾	2	2¼	2½	2¾	3		
3/8 (0.375)	0.203-0.374	0.187-0.359	5/8	21/32	1/2	3/16		1¾	2	2¼	2½	2¾	3		
1/2 (0.500)	0.203-0.499	0.187-0.484	13/16	27/32	5/8	3/16			2	2¼	2½	2¾	3	3½	
5/8 (0.625)	0.266-0.624	0.250-0.609	15/16	31/32	3/4	1/4			2	2¼	2½	2¾	3	3½	
3/4 (0.750)	0.328-0.749	0.312-0.734	1 1/16	1 3/32	7/8	1/4				2¼	2½	2¾	3	3½	4
1 (1.000)	0.390-0.999	0.375-0.984	1 1/4	1 9/32	1 1/8	1/4					2½	2¾	3	3½	4

All dimensions are given in inches.

NOTE: Keying Flat to be optional with user and/or manufacturer. If "Standard Key Flat" is specified, it is to be as shown.

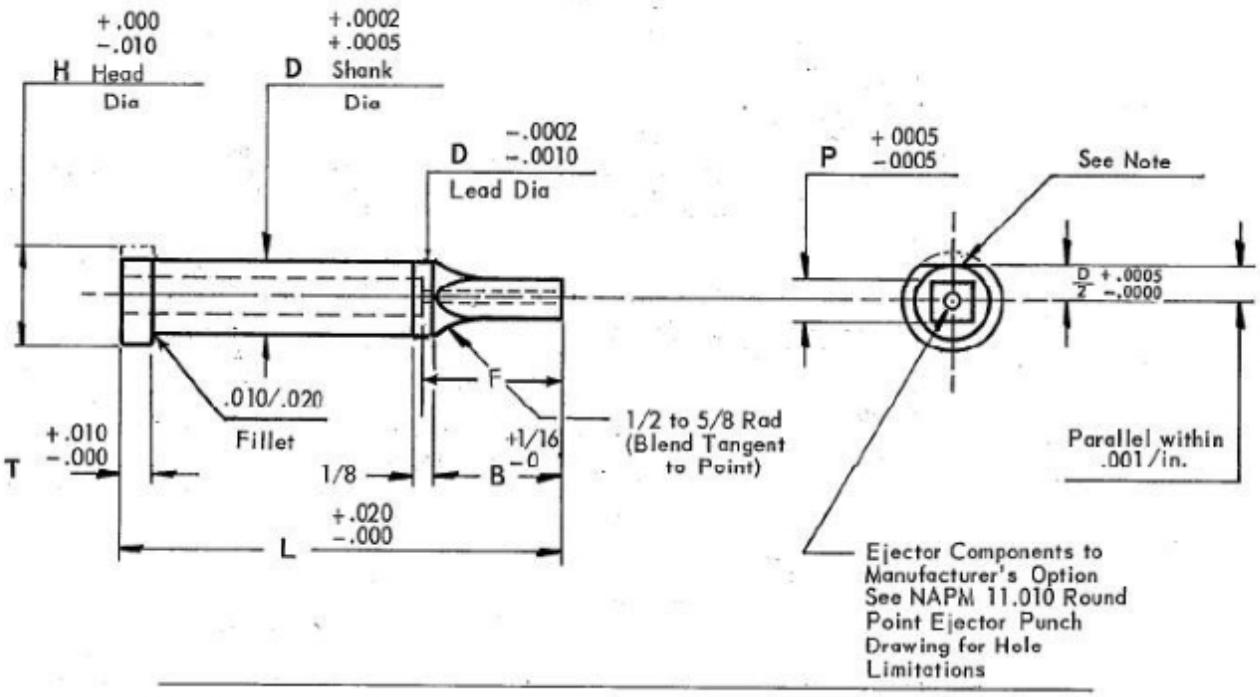
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USA STANDARD

Table No. 11

BASIC HEAD TYPE PERFORATING EJECTOR PUNCH, SQUARE

NAPM 11.111 (Ref.)



Material: Tool Steel

Hardness: Point and Shank Rc 60–63
Head Rc 40–55

Concentricity: Point–Shank (P:D) 0.001 T.I.R. (Max)

Taper: (Point *P*)
0.001/inch Max Backtaper Only
(Point End Large)

Shank: Foretaper Only (Head End Large) – Both Ends to be within Dia Tolerances

Nominal Shank Dia *D*	Range of Point Size *P*	Point Lg *B*	C bore Dim *F* (Min)	Head Dia *H*	Head Thk *T*	Overall Lengths *L*								
3/16 (0.1875)	0.062-0.131	7/16	15/32	5/16	1/8	1½	1¾	2	2¼	2½				
¼ (0.250)	0.093-0.176	½	17/32	⅜	⅛	1½	1¾	2	2¼	2½				
5/16 (0.3125)	0.125-0.220	9/16	19/32	7/16	⅛	1½	1¾	2	2¼	2½	2¾	3		
⅜ (0.375)	0.187-0.265	⅝	21/32	½	3/16		1¾	2	2¼	2½	2¾	3		
½ (0.500)	0.187-0.353	13/16	27/32	⅝	3/16			2	2¼	2½	2¾	3	3½	
⅝ (0.625)	0.250-0.441	15/16	31/32	¾	¼			2	2¼	2½	2¾	3	3½	
¾ (0.750)	0.312-0.530	1 1/16	1 3/32	⅞	¼				2¼	2½	2¾	3	3½	4
1 (1.000)	0.437-0.706	1¼	1 9/32	1⅛	¼					2½	2¾	3	3½	4

All dimensions are given in inches.

NOTE: Keying Flat to be optional with user and/or manufacturer. If "Standard Key Flat" is specified, it is to be as shown.

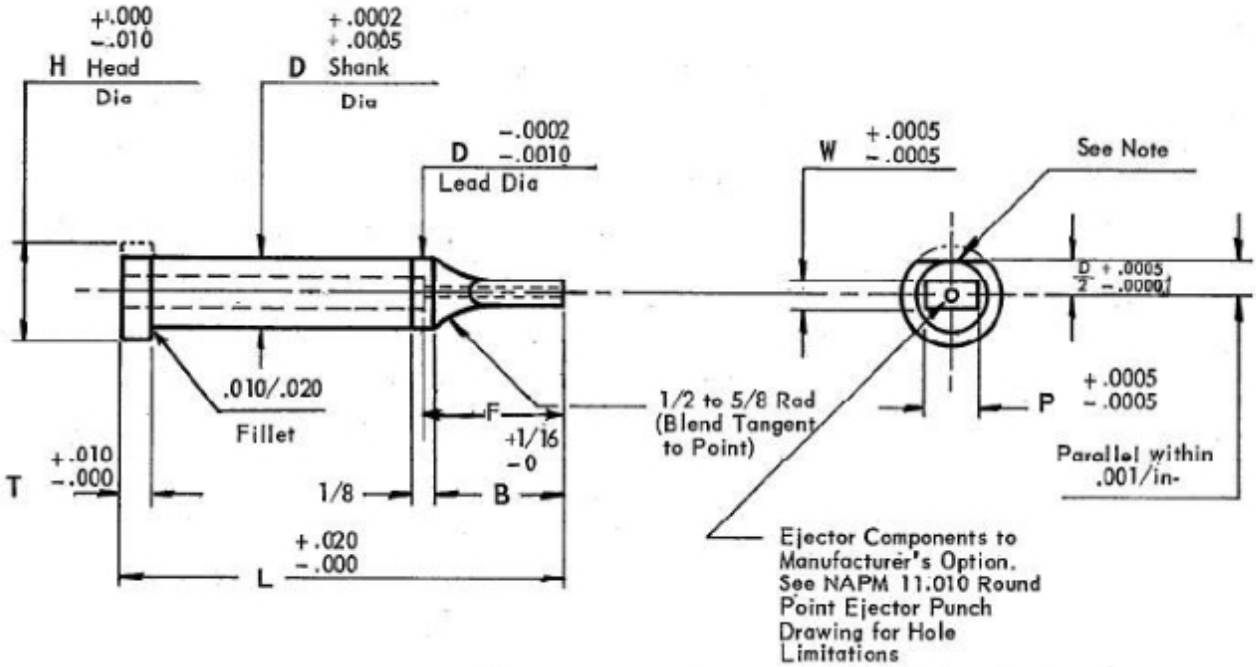
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PUNCHES – BASIC HEAD TYPE

Table No. 12

BASIC HEAD TYPE PERFORATING EJECTOR PUNCH, RECTANGLE

NAPM 11.112 (Ref.)



Material: Tool Steel

Hardness: Point and Shank Rc 60–63
Head Rc 40–55

Concentricity: Point–Shank (P:D) 0.001 T.I.R. (Max)

Taper: (Point $P \times W$)
0.001/inch Max Backtaper Only
(Point End Large)

Shank: Foretaper Only (Head End Large) – Both Ends to be within Dia Tolerances

Nominal Shank Dia D	Range of Point Sizes P	W	Point Lg B	C bore Dim F (Min)	Head Dia H	Head Thk T	Overall Lengths L								
3/16 (0.1875)	0.078-0.141	0.062-0.119	7/16	15/32	5/16	1/8	1 1/2	1 3/4	2	2 1/4	2 1/2				
1/4 (0.250)	0.109-0.208	0.093-0.130	1/2	17/32	3/8	1/8	1 1/2	1 3/4	2	2 1/4	2 1/2				
5/16 (0.3125)	0.141-0.250	0.125-0.175	9/16	19/32	7/16	1/8	1 1/2	1 3/4	2	2 1/4	2 1/2	2 3/4	3		
3/8 (0.375)	0.203-0.282	0.187-0.242	5/8	21/32	1/2	3/16		1 3/4	2	2 1/4	2 1/2	2 3/4	3		
1/2 (0.500)	0.203-0.375	0.187-0.324	13/16	29/32	5/8	3/16			2	2 1/4	2 1/2	2 3/4	3	3 1/2	
5/8 (0.625)	0.266-0.500	0.250-0.367	15/16	31/32	3/4	1/4			2	2 1/4	2 1/2	2 3/4	3	3 1/2	
3/4 (0.750)	0.328-0.625	0.312-0.411	1 1/16	1 3/32	7/8	1/4				2 1/4	2 1/2	2 3/4	3	3 1/2	4
1 (1.000)	0.390-0.875	0.375-0.480	1 1/4	1 9/32	1 1/8	1/4					2 1/2	2 3/4	3	3 1/2	4

All dimensions are given in inches.

NOTE: Keying Flat to be optional with user and/or manufacturer. If "Standard Key Flat" is specified, it is to be as shown.

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USA Standards for
Machine Tools and Cutting Tools

TITLE OF STANDARD	
T-Slots, Their Bolts, Nuts, Tongues, and Cutters	B5.1–1949
Milling Cutters	B5.3–1960
Rotating Air Cylinders and Adapters	B5.5–1959
Jig Bushings	B5.6–1962
Circular and Dovetailed Forming Tool Blanks	B5.7–1954
Chucks and Chuck Jaws	B5.8–1954 (Reaffirmed 1959)
Spindle Noses for Tool Room Lathes, Engine Lathes, Turret Lathes, and Automatic Lathes	B5.9–1967
Machine Tapers	B5.10–1963
Spindle Noses and Adjustable Adapters for Multiple Spindle Drilling Heads	B5.11–1964
Involute Splines, Serrations and Inspection	B5.15–1960
Accuracy of Engine and Tool Room Lathes	B5.16–1952
Markings for Identifying Grinding Wheels and Other Bonded Abrasives	B5.17–1958
Spindle Noses and Arbors for Milling Machines	B5.18–1960
Life Tests of Single-Point Tools	B5.19–1946 (Reaffirmed 1953)
Machine Pins	B5.20–1958
Single Point Tools and Tool Posts	B5.22–1950
Punch and Die Sets for Two-Post Punch Press Tools	B5.25–1950
Drill Drivers	B5.27–1959
Mounting Dimensions of Lubricating and Coolant Pumps for Machine Tools	B5.28–1958
Designation and Working Ranges of Grinding Machines	B5.32 & 33 –1953
Life Tests for Single-Point Tools of Sintered Carbide	B5.34–1956
Machine Mounting Specifications for Abrasive Discs and Plate Mounted Wheels	B5.35–1957
Driving and Spindle Ends for Portable Air and Electric Tools	B5.38–1958
Spindle Flanges for Precision Boring Machines	B5.39–1961
Spindle Noses and Tool Shanks for Horizontal Boring Machines	B5.40–1962
Blanks and Semi-Finished Blanks for Solid Carbide Taps	B94.1–1964
Reamers	B94.2–1964
Straight Cut-Off Blades for Lathes and Screw Machines	B94.3–1965
Identification System for Throw Away Inserts for Cutting Tools	B94.4–1965
Carbide Blanks and Cutting Tools	B94.5–1966
Knurling	B94.6–1966
Hobs	B94.7–1966
Inserted Blade Milling Cutter Bodies	(Rev. B5.23–1958) B94.8–1967
Taps Cut and Ground Threads	(Rev. B5.4 –1959) B94.9–1967
High-Speed Steel and Cast Nonferrous Single-Point Tools and Tool Holders	(Rev. B5.29–1959) B94.10–1968
Twist Drills	(Rev. B5.12–1958) B94.11–1967
Carbide-Tipped Masonry Drills, and Blanks for Carbide-Tipped Masonry Drills	(Rev. B82.1–1962) B94.12–1968
Blanks for Carbide Burs	(Rev. B83.1–1962) B94.13–1968
Punches-Basic Head Type	B94.14–1968

Binders for holding standards are available.

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

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