

ASME B107.31M-1997

SCREWDRIVERS, CROSS TIP GAGING

AN AMERICAN NATIONAL STANDARD



The American Society of
Mechanical Engineers



The American Society of
Mechanical Engineers

A N A M E R I C A N N A T I O N A L S T A N D A R D

SCREWDRIVERS, CROSS TIP GAGING

ASME B107.31M-1997

Date of Issuance: September 30, 1997

This Standard will be revised when the Society approves the issuance of a new edition. There will be no addenda or written interpretations of the requirements of this Standard issued to this edition.

ASME is the registered trademark of The American Society of Mechanical Engineers.

This code or standard was developed under procedures accredited as meeting the criteria for American National Standards. The Consensus Committee that approved the code or standard was balanced to assure that individuals from competent and concerned interests have had an opportunity to participate. The proposed code or standard was made available for public review and comment that provides an opportunity for additional public input from industry, academia, regulatory agencies, and the public-at-large.

ASME does not "approve," "rate," or "endorse" any item, construction, proprietary device, or activity.

ASME does not take any position with respect to the validity of any patent rights asserted in connection with any items mentioned in this document, and does not undertake to insure anyone utilizing a standard against liability for infringement of any applicable Letters Patent, nor assumes any such liability. Users of a code or standard are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, is entirely their own responsibility.

Participation by federal agency representative(s) or person(s) affiliated with industry is not to be interpreted as government or industry endorsement of this code or standard.

ASME accepts responsibility for only those interpretations issued in accordance with governing ASME procedures and policies which precludes the issuance of interpretations by individual volunteers.

No part of this document may be reproduced in any form,
in an electronic retrieval system or otherwise,
without the prior written permission of the publisher.

The American Society of Mechanical Engineers
345 East 47th Street, New York, NY 10017

Copyright © 1997 by
THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS
All Rights Reserved
Printed in U.S.A.

FOREWORD

(This Foreword is not part of ASME B107.31M-1997.)

The American National Standards Committee B107, Socket Wrenches and Drives, under sponsorship by The American Society of Mechanical Engineers, held its organizational meeting on June 28, 1967. Subsequently, the Committee was reorganized as an ASME Standards Committee and its title was changed to Hand Tools and Accessories.

Members of the Hand Tools Institute Screwdriver Standards Committee have been major contributors to the development of this Standard in their committee work, their knowledge of the products, and their active efforts in the promotion of the adoption of the Standard.

This Standard covers the dimensional and functional characteristics of gaging for cross tip screwdrivers.

Suggestions for improvement of this Standard will be welcome. They should be sent to the Secretary, B107 Main Committee, The American Society of Mechanical Engineers, 345 East 47th Street, New York, NY 10017.

This Standard was submitted to industry for review and comment. Following approval by ASME Standards Committee B107, it was approved by the American National Standards Institute on April 29, 1997.

ASME STANDARDS COMMITTEE B107

Hand Tools and Accessories

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

OFFICERS

R. R. McCullough, *Chair*
R. B. Wright, *Vice Chair*
G. L. Fechter, *Secretary*

COMMITTEE PERSONNEL

R. M. Byrne, Trade Association Management Inc.
A. A. Speranza, *Alternate*, Hand Tools Institute
G. L. Fechter, The American Society of Mechanical Engineers
A. Herskovitz, U.S. Department of the Army
C. M. Knapp, U.S. Air Force
J. C. Marvil, General Services Administration
A. Carr, *Alternate*, General Services Administration
R. R. McCullough, Cooper Industries
G. E. Olson, Consultant
B. Pagac, Snap-On Inc.
R. W. Reynolds, Lifetime Auto International
W. R. Wacker, BAC Associates, Inc.
R. B. Wright, Wright Tool Co.

CONTENTS

Foreword	iii
Standards Committee Roster	v
1 Scope	1
2 Classification	1
3 Normative Reference	1
4 General Description of Gaging Systems	1

Figures

1 Penetration Gage Assembly for Cross Tip Screwdriver	2
2 Housing	3
3 Anvil	4
4 Spacer	4
5 Bowed Retaining Ring	5
6 Style A Ring Gage for Type PH, Sizes 1 Through 4	6
7 Style A Ring Gage for Type PH, Size 0	8
8 Style A Ring Gage for Type PZ	9
9 Master Plug Gage (PH), Sizes 1 Through 4	10
10 Master Plug Gage (PH), Size 0	12
11 Master Plug Gage (PZ)	14
12 Style B GO/NO GO Ring Penetration Gage (PH), Sizes 1 Through 4	16
13 Style B GO/NO GO Ring Penetration Gage (PH), Size 0	18
14 Penetration GO/NO GO Gage (PZ)	19

Tables

1 Anvil and Spacer Dimensions	5
2 Style A Ring Gage Dimensions for Phillips Screwdriver Tips, Sizes 1 Through 4	7
3 Style A Ring Gage Dimensions for Phillips Screwdriver Tips, Size 0	8
4 Style A Ring Gage Dimensions for Pozidriv Screwdriver Tips	9
5 Driver Penetration Limits	10
6 Master Plug Gage Dimensions for Phillips Cross Recesses, Sizes 1 Through 4	11
7 Master Plug Gage Dimensions for Phillips Cross Recesses, Size 0	13
8 Pozidriv Master Plug Gage Dimensions	15
9 Style B Ring Gage Dimensions for Phillips Screwdriver Tips, Sizes 1 Through 4	17
10 Style B Ring Gage Dimensions for Phillips Screwdriver Tips, Size 0	18
11 Ring Gage Dimensions for Pozidriv Screwdriver Tips	19

SCREWDRIVERS, CROSS TIP GAGING

1 SCOPE

This Standard specifies two types of penetration gaging of Phillips® (PH) and Pozidriv® (PZ) screwdrivers and supplements the ASME blade and bit standards.¹

2 CLASSIFICATION

Style A: Driver Penetration Gage With Indicator
Style B: GO/NO GO Ring Penetration Gage

3 NORMATIVE REFERENCE

ASTM E 18-94, Standard Test Methods for Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials

4 GENERAL DESCRIPTION OF GAGING SYSTEMS

The two gaging systems described below are not intended to check all dimensions of the drivers. The manufacturer must be responsible for in-process measurements of the individual characteristic dimensions of the drivers.

¹ Phillips, Pozidriv, PZ1, PZ2, and PZ3 are registered trademarks of the Phillips Screw Company.

4.1 Style A: Driver Penetration Gage With Indicator

This method of penetration gaging is a quantitative method of gaging.

This method of inspection of cross tip screwdrivers involves the use of the Penetration Gage Assembly (PGA) indicator gage shown in Fig. 1. The PGA has the ring gage mounted inside. This system provides actual measurements of driver penetration as it relates to a master plug gage. Figures 2-11 and Table 1 provide the dimensions for the gage assembly. The ring gage dimensions are found in Tables 2 and 3 for Type PH and Table 4 for Type PZ.

The PGA is used to inspect cross tip drivers as follows.

- (a) A master plug gage is inserted in the ring gage and sufficient force is applied to fully seat the plug gage.
- (b) The indicator is set to zero.
- (c) The driver to be inspected is seated in the ring gage and the penetration reading shall comply with Table 5.

4.2 Style B: GO/NO GO Ring Penetration Gage

The GO/NO GO ring penetration gaging system involves the use of master plug gages and ring gages. The ring gage, also known as a *step gage*, is to be used as a working gage and is to be checked with a master plug gage periodically. The master plug gages are defined in Tables 6, 7, and 8. Dimensions are given for the ring gages in Tables 9, 10, and 11. The screwdriver and master plug gage shall fit the ring gage so that dimension *G* in Tables 6, 7, and 8 falls within the step on the face of the ring gage.

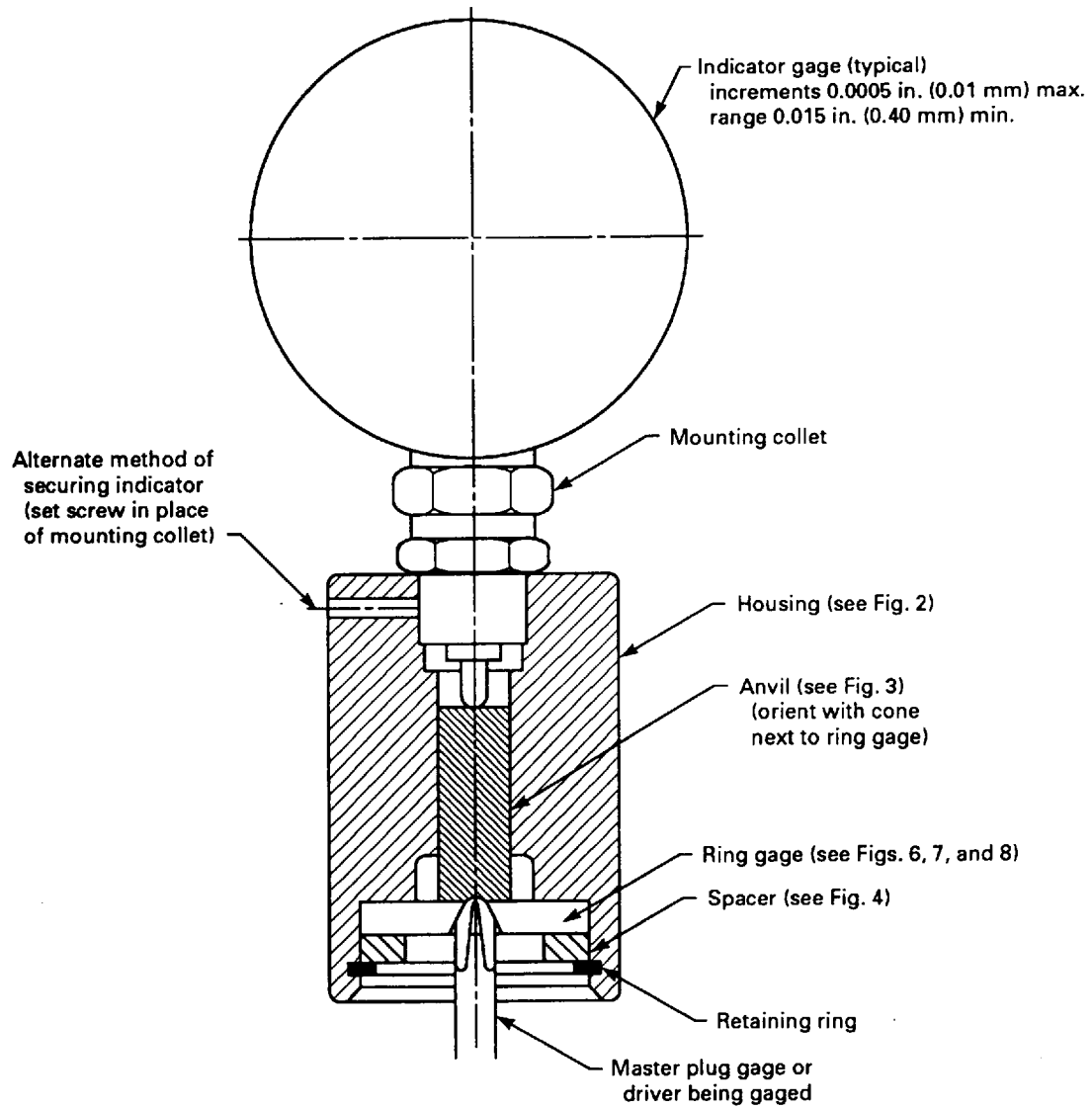
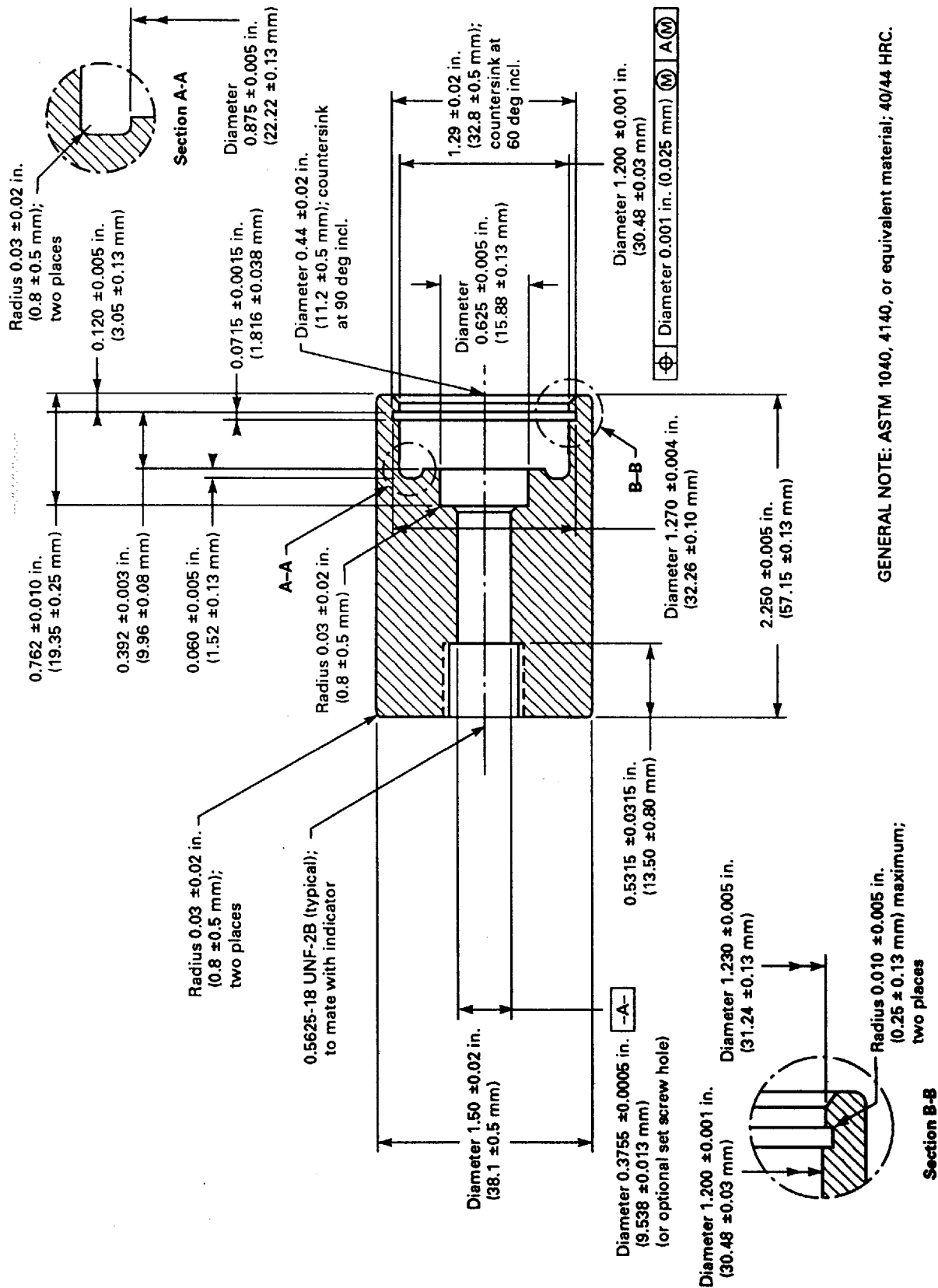


FIG. 1 PENETRATION GAGE ASSEMBLY FOR CROSS TIP SCREWDRIVER

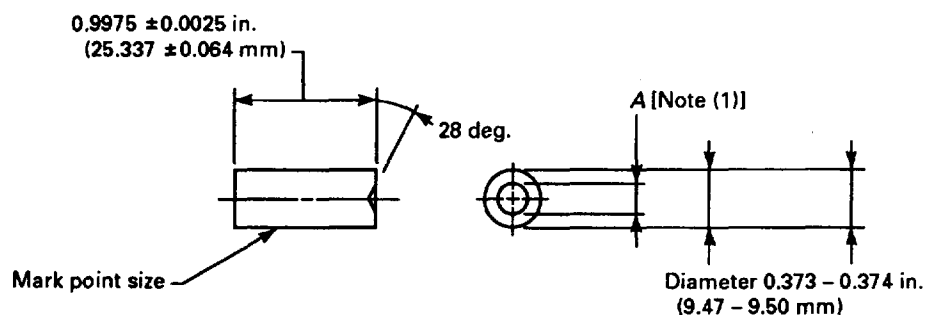
SCREWDRIVERS, CROSS TIP GAGING

ASME B107.31M-1997



GENERAL NOTE: ASTM 1040, 4140, or equivalent material; 40/44 HRC.

FIG. 2 HOUSING

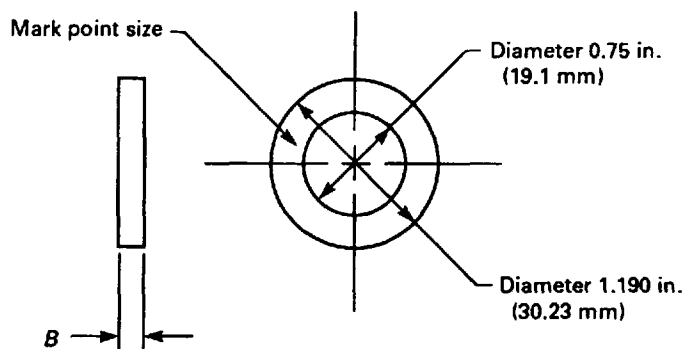


GENERAL NOTES: Tool steel material, 58-66 RC.

NOTE:

(1) Diameter A to be concentric to O.D. within 0.001 in. (0.025 mm).

FIG. 3 ANVIL



GENERAL NOTE: ASTM 1040, 4140, or equivalent material; 40/44 HRC.

FIG. 4 SPACER

TABLE 1 ANVIL AND SPACER DIMENSIONS

Point Size		Anvil Cone Diameter A (See Fig. 3) +0.000 in. (+0.00 mm) -0.001 in. (-0.03 mm)		Spacer Thickness B (See Fig. 4) ± 0.0020 in. (± 0.051 mm)	
Phillips	Pozidriv	Phillips, in. (mm)	Pozidriv, in. (mm)	Phillips, in. (mm)	Pozidriv, in. (mm)
P0	PZ0	0.033 (0.84)	0.036 (0.91)	0.2520 (6.401)	0.2890 (7.341)
P1	PZ1	0.051 (1.30)	0.055 (1.40)	0.2200 (5.588)	0.2600 (6.604)
P2	PZ2	0.091 (2.31)	0.096 (2.44)	0.1575 (4.001)	0.2200 (5.588)
P3	PZ3	0.151 (3.84)	0.156 (3.96)	0.0638 (1.621)	0.1900 (4.826)
P4	PZ4	0.201 (5.11)	0.204 (5.18)	NA	0.1357 (3.447)

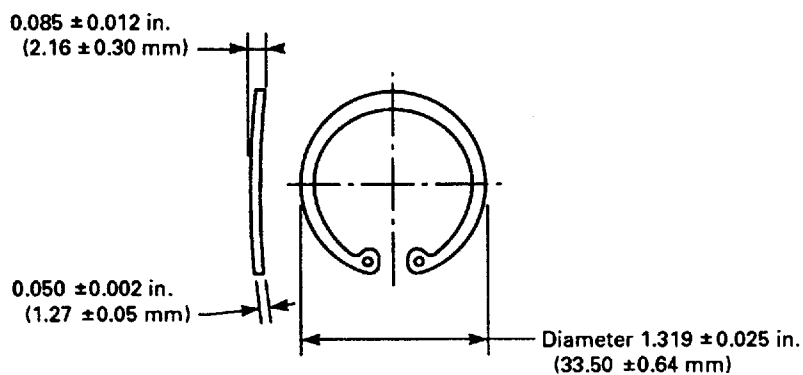
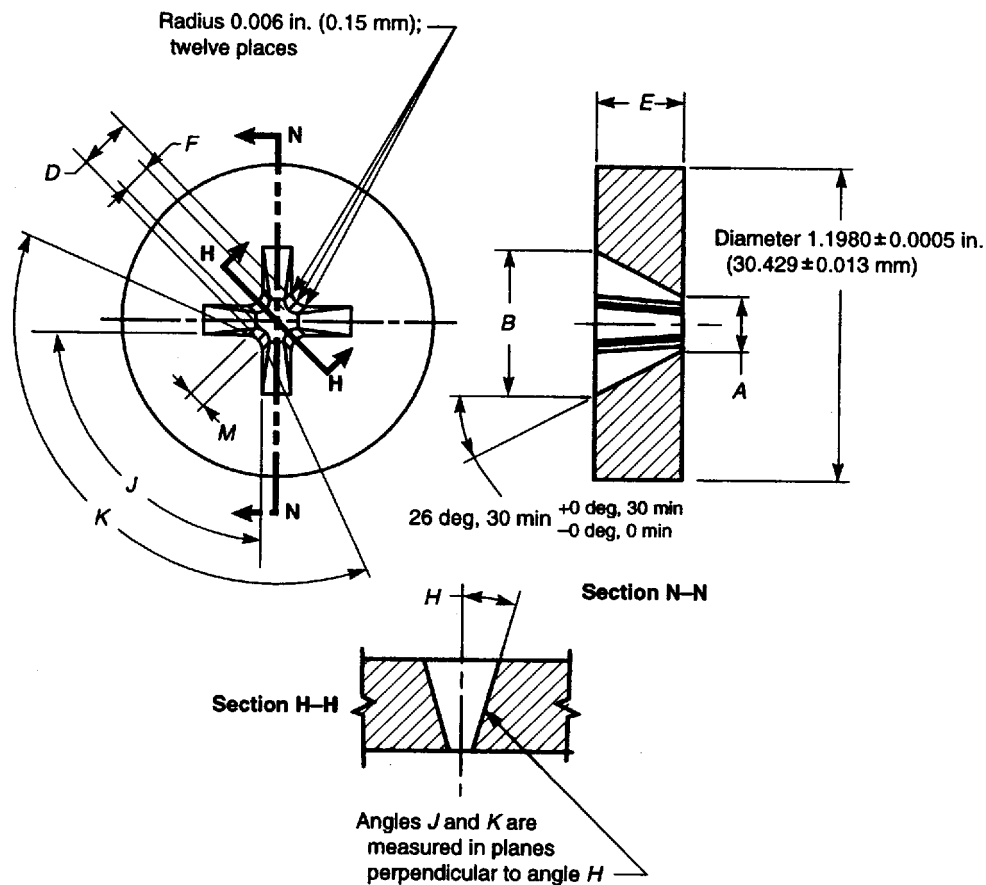


FIG. 5 BOWED RETAINING RING

**GENERAL NOTES:**

- (a) Tool steel material 62/66 HRC or steel 62/66 HRC equivalent case hardened at 0.010 in. (0.25 mm) minimum depth.
 (b) Form concentric to O.D. within 0.002 in. (0.051 mm).

FIG. 6 STYLE A RING GAGE FOR TYPE PH, SIZES 1 THROUGH 4

SCREWDRIVERS, CROSS TIP GAGING

ASME B107.31M-1997

**TABLE 2 STYLE A RING GAGE DIMENSIONS FOR PHILLIPS SCREWDRIVER TIPS,
SIZES 1 THROUGH 4**

Point Size	A, in. (mm), ± 0.0004 (± 0.010)	B, in. (mm) (Ref.)	D, in. (mm) (Ref.)	E, in. (mm), ± 0.002 (± 0.051)	F, in. (mm), $+0.0008, -0$ ($+0.020, -0$)	H, deg. +15 min, -0	J, deg. +0, -15 min	K, deg. +0, -15 min	M, in. (mm), ± 0.001 (± 0.025)
1	0.0660 (1.676)	0.176 (4.470)	0.070 (1.778)	0.1100 (2.794)	0.0425 (1.080)	7	92	138	0.017 (0.432)
2	0.1060 (2.692)	0.278 (7.061)	0.098 (2.489)	0.1725 (4.382)	0.0636 (1.615)	5 deg, 45 min	92	140	0.032 (0.813)
3	0.1660 (4.216)	0.432 (10.973)	0.156 (3.962)	0.2662 (6.761)	0.1022 (2.596)	5 deg, 45 min	92	146	0.079 (2.007)
4	0.2160 (5.486)	0.544 (13.818)	0.227 (5.766)	0.3287 (8.349)	0.1459 (3.706)	7	92	153	0.095 (2.413)

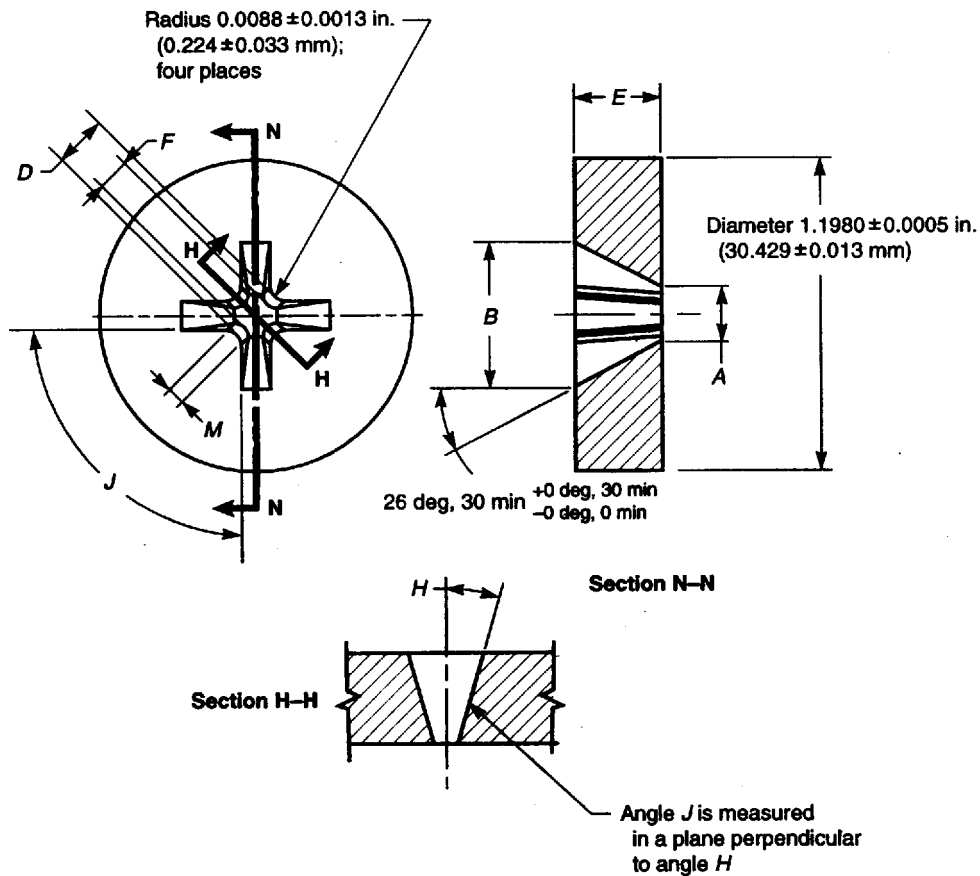
GENERAL NOTES:

- (a) Refer to Fig. 6.
(b) See Table 3 for Size 0.

TABLE 3 STYLE A RING GAGE DIMENSIONS FOR PHILLIPS SCREWDRIVER TIPS, SIZE 0

Point Size	A, in. (mm), ± 0.0004 (± 0.010)	B, in. (mm) (Ref.)	D, in. (mm) (Ref.)	E, in. (mm), ± 0.002 (± 0.051)	F, in. (mm), ± 0.0004 (± 0.010)	H, deg, +15 min, -0	J, deg, +0, -15 min	M, in. (mm), ± 0.0018 (± 0.046)
0	0.048 (1.219)	0.1230 (3.124)	0.027 (0.686)	0.078 (1.981)	0.0265 (0.673)	7	92	0.0122 (0.310)

GENERAL NOTE: Refer to Fig. 7.

**GENERAL NOTES:**

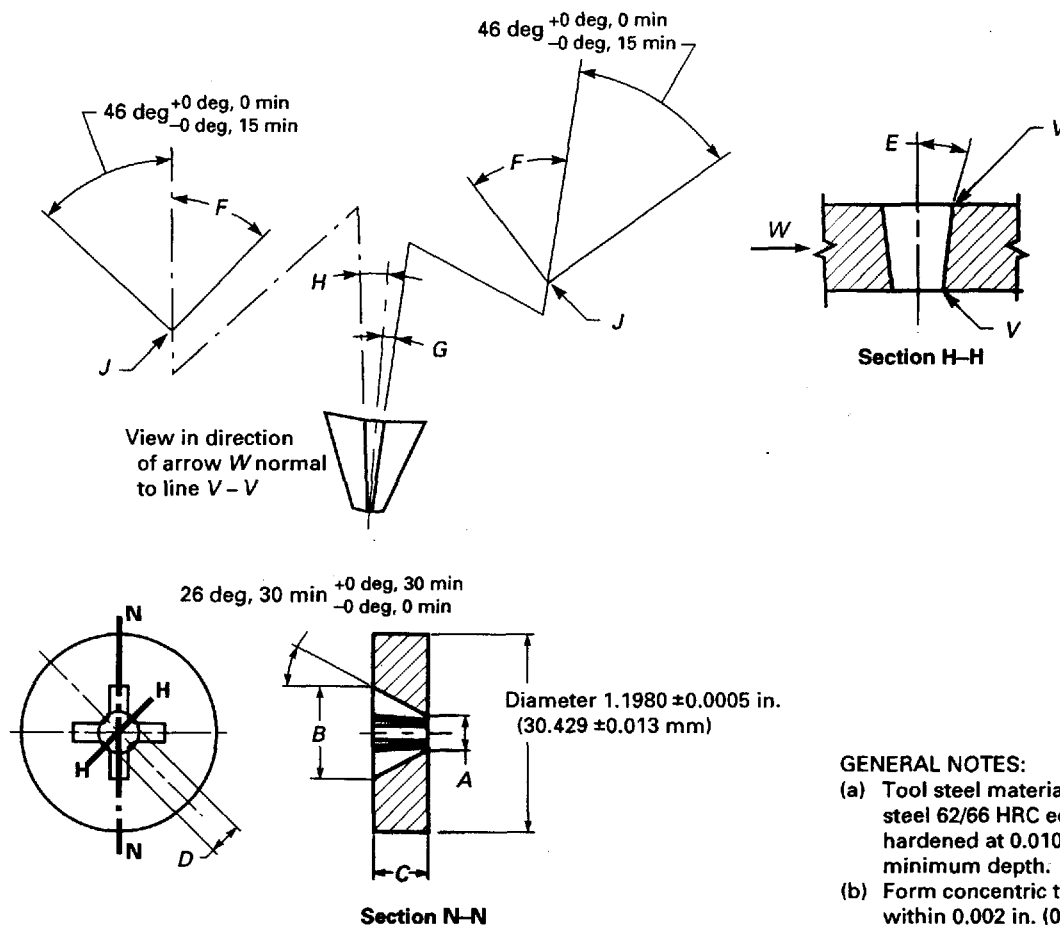
- (a) Tool steel material 62/66 HRC or steel 62/66 HRC equivalent case hardened at 0.010 in. (0.25 mm) minimum depth.
 (b) Form concentric to O.D. within 0.002 in. (0.051 mm).

FIG. 7 STYLE A RING GAGE FOR TYPE PH, SIZE 0

TABLE 4 STYLE A RING GAGE DIMENSIONS FOR POZIDRIV SCREWDRIVER TIPS

Point Size	A, in. (mm), ± 0.0004 (± 0.010)	B, in. (mm) (Ref.)	C, in. (mm), ± 0.002 (± 0.051)	D, in. (mm), +0, -0.0010 (+0, -0.025)	E, deg, +15 min, -0	F, deg, +0, -15 min	G, deg, +0, -15 min	H, deg, +0, -15 min	J, in. (mm)	
									Max.	Min.
0	0.051 (1.295)	0.074 (1.880)	0.047 (1.194)	0.0310 (0.7874)	7	46	4 deg, 23 min	7 deg, 45 min	0.004 (0.102)	0.003 (0.076)
1	0.065 (1.651)	0.135 (3.429)	0.070 (1.778)	0.0477 (1.2116)	7	46	4 deg, 23 min	7 deg, 45 min	0.005 (0.127)	0.004 (0.102)
2	0.111 (2.819)	0.217 (5.512)	0.110 (2.794)	0.0719 (1.8263)	5 deg, 45 min	46	3 deg	6 deg, 20 min	0.008 (0.203)	0.006 (0.152)
3	0.171 (4.343)	0.312 (7.925)	0.140 (3.556)	0.1078 (2.2381)	5 deg, 45 min	56 deg, 15 min	3 deg	6 deg, 20 min	0.012 (0.305)	0.008 (0.203)
4	0.219 (5.563)	0.413 (10.490)	0.193 (4.902)	0.1587 (4.0310)	7	56 deg, 15 min	4 deg, 23 min	7 deg, 45 min	0.020 (0.508)	0.014 (0.356)

GENERAL NOTE: Refer to Fig. 8.

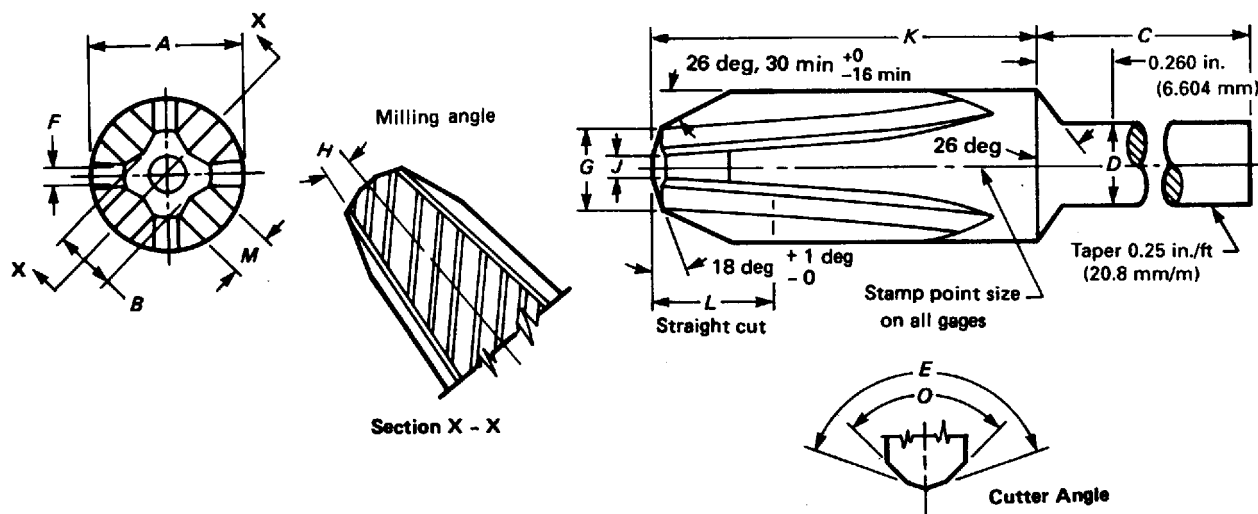
**GENERAL NOTES:**

- Tool steel material 62/66 HRC or steel 62/66 HRC equivalent case hardened at 0.010 in. (0.25 mm) minimum depth.
- Form concentric to O.D. within 0.002 in. (0.051 mm).

FIG. 8 STYLE A RING GAGE FOR TYPE PZ

TABLE 5 DRIVER PENETRATION LIMITS

Phillips and Pozidriv Point Size	Dial Indicator Reading, in. (mm)
0	± 0.005 (± 0.13)
1	± 0.005 (± 0.13)
2	± 0.005 (± 0.13)
3	± 0.005 (± 0.13)
4	± 0.005 (± 0.13)


FIG. 9 MASTER PLUG GAGE (PH), SIZES 1 THROUGH 4

**TABLE 6 MASTER PLUG GAGE DIMENSIONS FOR PHILLIPS CROSS RECESSES,
SIZES 1 THROUGH 4**

Point Size	A, in. (mm), ±0.010 (±0.254)	B, in. (mm), +0, -0.001 (+0, -0.025)	C, in. (mm), ±0.06 (±1.52)	D, in. (mm)	E, deg, +15 min, -0	F, in. (mm) (Ref.)	
						Max.	Min.
1	0.18 (4.57)	0.0394 (1.0008)	0.75 (19.05)	0.181 (4.597)	138	0.020 (0.508)	0.018 (0.457)
2	0.25 (6.35)	0.0606 (1.5392)	0.75 (19.05)	0.181 (4.597)	140	0.025 (0.635)	0.023 (0.584)
3	0.31 (7.87)	0.0983 (2.4968)	1 (25.4)	0.240 (6.096)	146	0.031 (0.787)	0.029 (0.737)
4	0.38 (9.65)	0.1407 (3.5738)	1 (25.4)	0.240 (6.096)	153	0.044 (1.118)	0.042 (1.067)

Point Size	G, in. (mm), +0.001, -0 (+0.025, -0)	H, deg, +0, -15 min	J, in. (mm)		K, in. (mm), ±0.06 (±1.52)	L, Min., in. (mm)	M, in. (mm), +0, -0.001 (+0, -0.025)	O, deg, +15 min, -0
			Max.	Min.				
1	0.050 (1.270)	7	0.020 (0.508)	0.015 (0.381)	0.88 (22.35)	0.19 (4.826)	0.0202 (0.5131)	92
2	0.090 (2.286)	5 deg, 45 min	0.020 (0.508)	0.015 (0.381)	0.88 (22.35)	0.28 (7.112)	0.0434 (1.1024)	92
3	0.150 (3.810)	5 deg, 45 min	0.020 (0.508)	0.015 (0.381)	1 (25.4)	0.44 (11.18)	0.0826 (2.0980)	92
4	0.200 (5.080)	7	0.020 (0.508)	0.015 (0.381)	1 (25.4)	0.53 (13.46)	0.1078 (2.7381)	92

GENERAL NOTES:

- (a) Refer to Fig. 9.
(b) See Table 7 for Size 0.

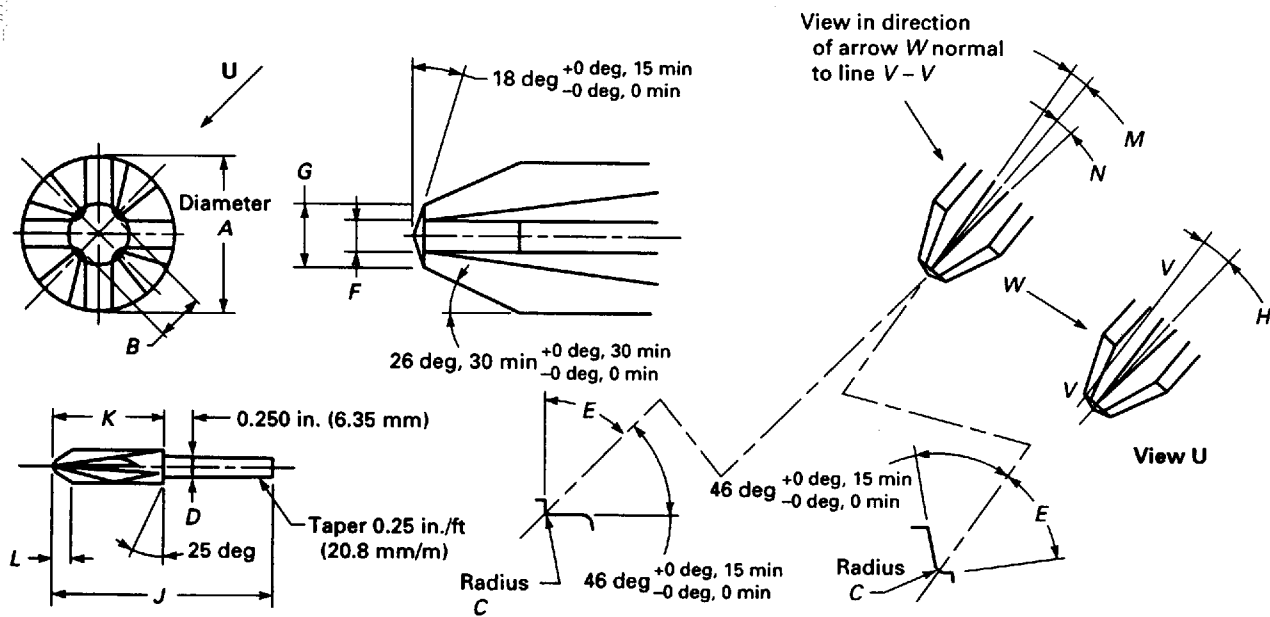
SCREWDRIVERS, CROSS TIP GAGING

ASME B107.31M-1997

TABLE 7 MASTER PLUG GAGE DIMENSIONS FOR PHILLIPS CROSS RECESSES, SIZE 0

Point Size	A, in. (mm), ± 0.010 (± 0.254)	B, in. (mm), ± 0.0005 (± 0.0127)	C, in. (mm), ± 0.06 (± 1.52)	D, in. (mm) (Ref.)	F, in. (mm), ± 0.001 (± 0.025)	G, in. (mm), $+0.001, -0$ ($+0.025, -0$)	H, deg, $+0, -15$ min	K, in. (mm), ± 0.06 (± 1.52)	L, Min., in. (mm)	M, in. (mm), ± 0.0013 (± 0.0330)	O, deg, $+15$ min, -0
0	0.13 (3.30)	0.0235 (0.5969)	0.75 (19.05)	0.181 (4.597)	0.011 (0.279)	0.032 (0.813)	7	0.88 (22.35)	0.19 (4.83)	0.0138 (0.3505)	92

GENERAL NOTE: Refer to Fig. 10.



GENERAL NOTE: Tool steel material, 62/66 HRC.

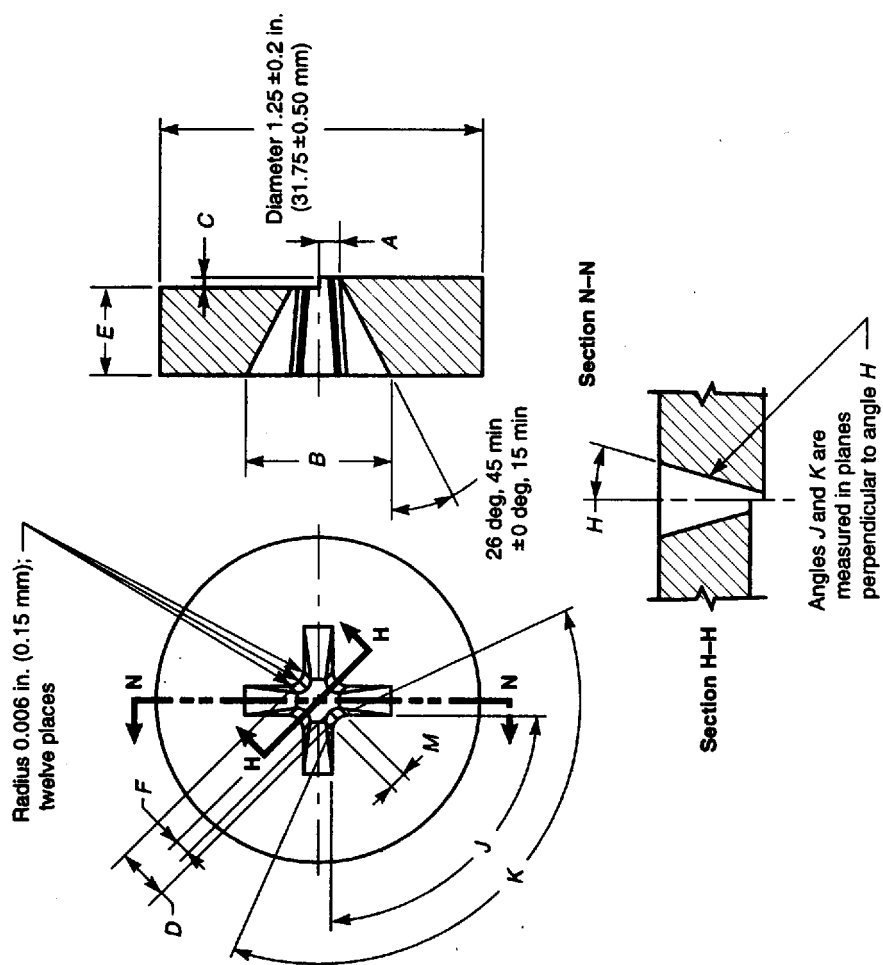
FIG. 11 MASTER PLUG GAGE (PZ)

TABLE 8 POZIDRIV MASTER PLUG GAGE DIMENSIONS

Point Size	A, in. (mm), ±0.010 (±0.25)	B, in. (mm)		C, in. (mm)		D, in. (mm), +0, -0.001 (+0, -0.025)	E, deg, +7 min, -0	F, in. (mm)	
		Max.	Min.	Max.	Min.			Max.	Min.
0	0.125 (3.175)	0.0280 (0.7112)	0.0265 (0.6731)	0.004 (0.102)	0.003 (0.076)	0.181 (4.597)	46	0.0175 (0.4445)	0.0165 (0.4191)
1	0.188 (4.775)	0.0438 (1.1125)	0.0423 (1.0744)	0.005 (0.127)	0.004 (0.102)	0.181 (4.597)	46	0.0275 (0.6985)	0.0265 (0.6731)
2	0.250 (6.350)	0.0670 (1.7018)	0.0655 (1.6637)	0.008 (0.203)	0.006 (0.152)	0.181 (4.597)	46	0.0390 (0.9906)	0.0380 (0.9652)
3	0.313 (7.950)	0.1020 (2.5908)	0.1005 (2.5527)	0.012 (0.305)	0.008 (0.203)	0.240 (6.096)	56 deg, 15 min	0.0540 (1.3716)	0.0530 (1.3462)
4	0.375 (9.525)	0.1520 (3.8608)	0.1505 (3.8227)	0.020 (0.508)	0.014 (0.356)	0.240 (6.096)	56 deg, 15 min	0.0820 (2.0828)	0.0800 (2.032)

Point Size	G, in. (mm), +0.001, -0 (+0.025, -0)	H, deg, +0, -6 min	J, in. (mm), ±0.031 (±0.787)	K, in. (mm), ±0.031 (±0.787)	L, Min., in. (mm)	M, deg, +6 min, -0	N, deg, +6 min, -0
0	0.0350 (0.889)	7	1.625 (41.275)	0.875 (22.225)	0.078 (1.981)	4 deg, 23 min	7 deg, 45 min
1	0.0540 (1.372)	7	1.750 (44.450)	0.875 (22.225)	0.125 (3.175)	4 deg, 23 min	7 deg, 45 min
2	0.0950 (2.413)	5 deg, 45 min	1.750 (44.450)	0.875 (22.225)	0.188 (4.775)	3 deg	6 deg, 20 min
3	0.1550 (3.937)	5 deg, 45 min	2.000 (50.800)	1.000 (25.400)	0.281 (7.137)	3 deg	6 deg, 20 min
4	0.2030 (5.156)	7	2.000 (50.800)	1.000 (25.400)	0.344 (8.738)	4 deg, 23 min	7 deg, 45 min

GENERAL NOTE: Refer to Fig. 11.



GENERAL NOTE:
Tool steel material 62/66 HRC or steel 62/66 HRC equivalent case hardened at 0.010 in. (0.25 mm) minimum depth.

FIG. 12 STYLE B GO/NO GO RING PENETRATION GAGE (PH), SIZES 1 THROUGH 4

SCREWDRIVERS, CROSS TIP GAGING

ASME B107.31M-1997

TABLE 9 STYLE B RING GAGE DIMENSIONS FOR PHILLIPS SCREWDRIVER TIPS, SIZES 1 THROUGH 4

Point Size	A, in. (mm), ±0.0002 (±0.005)	B, in. (mm) (Ref.)	C, in. (mm), ±0.001 (±0.025)	D, in. (mm) (Ref.)	E, in. (mm), +0, -0.015 (+0, -0.38)	F, in. (mm), +0.0004, -0 (+0.010, -0)	H, deg, +15 min, -0	J, deg, +0, -15 min	K, deg, +0, -15 min	M, in. (mm), ±0.001 (±0.025)
1	0.0255 (0.6477)	0.176 (4.470)	0.010 (0.254)	0.070 (1.778)	0.125 (3.175)	0.0194 (0.4928)	7	92	138	0.017 (0.432)
2	0.0455 (1.1557)	0.278 (7.061)	0.010 (0.254)	0.098 (2.489)	0.1875 (4.763)	0.0303 (0.7696)	5 deg, 45 min	92	140	0.032 (0.813)
3	0.0755 (1.9177)	0.432 (10.973)	0.010 (0.254)	0.156 (3.962)	0.2812 (7.142)	0.0496 (1.2598)	5 deg, 45 min	92	146	0.079 (2.007)
4	0.1005 (2.5527)	0.544 (13.818)	0.010 (0.254)	0.227 (5.766)	0.3437 (8.730)	0.0711 (1.8059)	7	92	153	0.095 (2.413)

GENERAL NOTES:

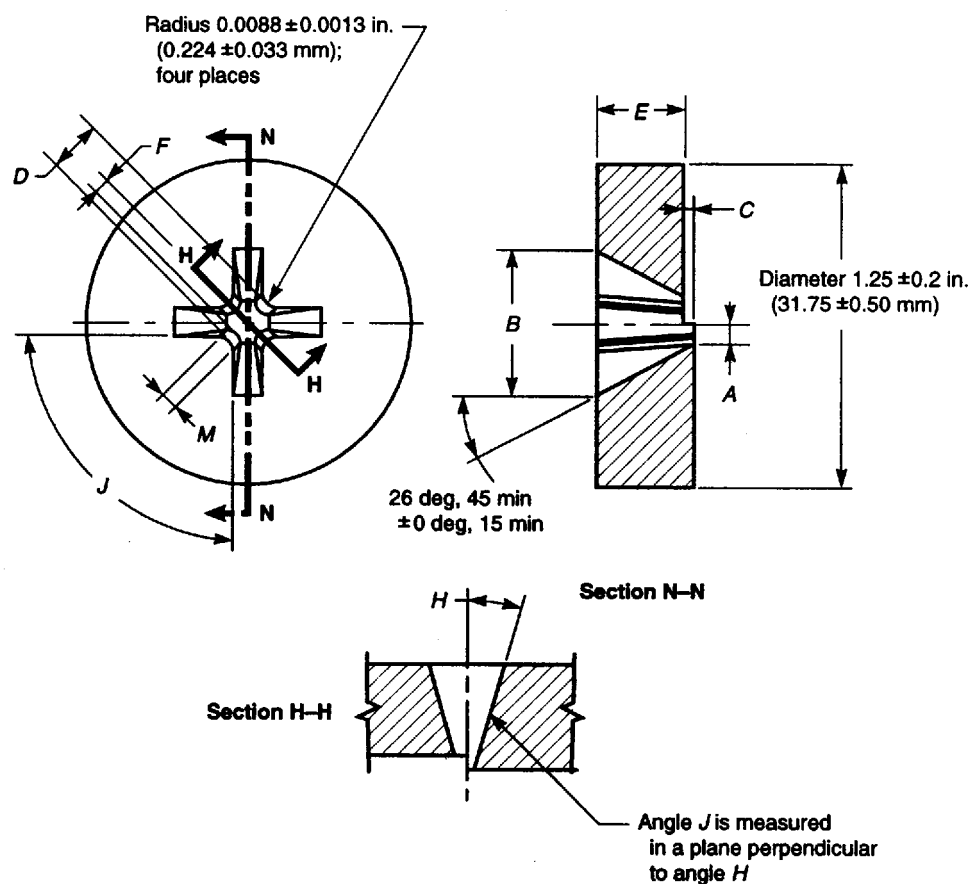
(a) Refer to Fig. 12.

(b) See Table 10 for Size 0.

TABLE 10 STYLE B RING GAGE DIMENSIONS FOR PHILLIPS SCREWDRIVER TIPS, SIZE 0

Point Size	A, in. (mm), ± 0.0002 (± 0.005)	B, in. (mm) (Ref.)	C, in. (mm), ± 0.001 (± 0.025)	D, in. (mm) (Ref.)	E, in. (mm), $+0, -0.015$ ($+0, -0.38$)	F, in. (mm), ± 0.0002 (± 0.005)	H, deg, $+15 \text{ min}, -0$	J, deg, $+0, -15 \text{ min}$	M, in. (mm), ± 0.0018 (± 0.046)
0	0.0165 (0.419)	0.1530 (3.886)	0.010 (0.254)	0.027 (0.686)	0.094 (2.388)	0.0114 (0.290)	7	92	0.0122 (0.3099)

GENERAL NOTE: Refer to Fig. 13.

**GENERAL NOTE:**

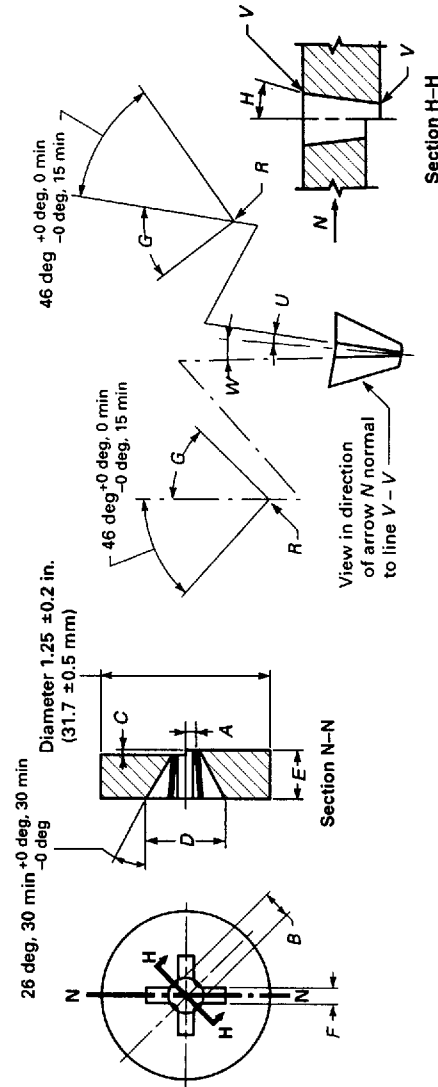
Tool steel material 62/66 HRC or steel 62/66 HRC equivalent case hardened at 0.010 in. (0.25 mm) minimum depth.

FIG. 13 STYLE B GO/NO GO RING PENETRATION GAGE (PH), SIZE 0

TABLE 11 RING GAGE DIMENSIONS FOR POZIDRIV SCREWDRIVER TIPS

Point Size	A, in. (mm), ±0.0002 (±0.005)	B, in. (mm), +0.0005, -0 (+0.013, -0)	C, in. (mm), ±0.001 (±0.025)	D, in. (mm) (Ref.)	E, in. (mm), ±0.002 (±0.051)	F, in. (mm), +0.0002, -0 (+0.005, -0)	G, deg, +15 min, -0	H, deg, +15 min, -0	R, in. (mm)		U, deg, +15 min, -0	W, deg, +15 min, -0
									Max.	Min.		
0	0.0175 (0.4445)	0.0275 (0.6985)	0.005 (0.127)	0.093 (2.362)	0.0582 (1.4783)	0.0175 (0.4445)	46	7	0.004 (0.102)	0.003 (0.076)	4 deg, 23 min	7 deg, 45 min
1	0.0270 (0.6858)	0.0440 (1.1176)	0.010 (0.254)	0.141 (3.581)	0.0872 (2.2149)	0.0275 (0.6985)	46	7	0.005 (0.127)	0.004 (0.102)	4 deg, 23 min	7 deg, 45 min
2	0.0470 (1.1938)	0.0674 (1.7120)	0.010 (0.254)	0.231 (5.867)	0.1374 (3.4900)	0.0390 (0.9906)	46	5 deg, 45 min	0.008 (0.203)	0.006 (0.152)	3 deg	6 deg, 20 min
3	0.0770 (1.9558)	0.1028 (2.6111)	0.010 (0.254)	0.357 (9.068)	0.2036 (5.1714)	0.0540 (1.3716)	56 deg, 15 min	5 deg, 45 min	0.012 (0.305)	0.008 (0.203)	3 deg	6 deg, 20 min
4	0.1010 (2.5654)	0.1533 (3.8938)	0.010 (0.254)	0.507 (12.878)	0.3059 (7.7699)	0.0820 (2.0828)	56 deg, 15 min	7	0.020 (0.508)	0.014 (0.356)	4 deg, 23 min	7 deg, 45 min

GENERAL NOTE: Refer to Fig. 14.



GENERAL NOTE:
Tool steel material 62/66 HRC or steel 62/66 HRC equivalent case hardened at 0.010 in. (0.25 mm) minimum depth.

FIG. 14 PENETRATION GO/NO GO GAGE (PZ)

AMERICAN NATIONAL STANDARDS FOR HAND TOOLS

Socket Wrenches, Hand (Inch Series).....	B107.1-1993
Socket Wrenches, Extensions, Adaptors, and Universal Joints, Power Drive (Impact) (Inch Series)	B107.2-1995
Socket Wrenches, Power Drive (Non-Impact) (Inch Series)	B107.3-1978(R1991)
Driving and Spindle Ends for Portable Hand, Impact, Air, and Electric Tools (Percussion Tools Excluded)	B107.4M-1995
Socket Wrenches, Hand (Metric Series)	B107.5M-1994
Wrenches, Box, Angled, Open End, Combination, Flare Nut, and Tappet (Inch Series)	B107.6-1994
Adjustable Wrenches	B107.8M-1996
Wrenches, Box, Angled, Open End, Combination, Flare Nut, and Tappet (Metric Series)	B107.9M-1994
Handles and Attachments for Hand Socket Wrenches — Inch and Metric Series	B107.10M-1996
Pliers, Diagonal Cutting, and Nippers, End Cutting	B107.11M-1993
Nut Drivers (Spin Type, Screwdriver Grip) (Inch Series)	B107.12-1997
Pliers — Long Nose, Long Reach	B107.13M-1996
Hand Torque Tools	B107.14M-1994
Flat Tip and Phillips Screwdrivers	B107.15-1993
Shears (Metal Cutting, Bench and Hand)	B107.16-1992
Gages, Wrench Openings, Reference	B107.17M-1997
Pliers (Wire Twister)	B107.18M-1996
Pliers, Retaining Ring	B107.19-1993
Pliers (Lineman's, Iron Worker's, Gas, Glass, and Fence)	B107.20M-1992
Wrench, Crowfoot Attachments	B107.21-1992
Electronic Cutters and Pliers	B107.22M-1991
Pliers, Multiple Position, Adjustable	B107.23M-1997
Pliers — Performance Test Methods	B107.25M-1996
Pliers, Multiple Position (Electrical Connector)	B107.27-1996
Screwdrivers, Cross Tip Gaging	B107.31M-1997
Socket Wrenches for Spark Plugs	B107.34M-1997
Nut Drivers (Spin Type, Screwdriver Grip) (Metric Series)	B107.35M-1997
Nail Hammers — Safety Requirements	B107.41M-1997
Hatchets: Safety Requirements	B107.42M-1997

The ASME Publications Catalog shows a complete list of all the Standards published by the Society. For a complimentary catalog, or the latest information about our publications, call 1-800-THE-ASME (1-800-843-2763).