

TECHNICAL MANUAL



TRI-WING® Drive Systems

Includes comprehensive engineering Head Standards, Driver Bit Standards, Gaging Standards and Punch Standards.



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TRI-WING®

Drive System Technical Manual



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Issue: 10/11

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9-9-75
11-26-90
7-10-03
12-07-07

TRI-WING[®] ENGINEERING MANUAL

HEAD STANDARDS

<u>SHEET NUMBER</u>	<u>DESCRIPTION</u>	<u>DATE</u>
TWPC-1	Punch Code Description	11-26-90
TWHS-1	100° Flush Head	11-26-90
TWHS-1A	Deep Recess 100° Flush Head	11-26-90
TWHS-2	Pan Head	11-26-90
TWHS-3	100° Flat Head Shear Bolt	11-26-90
TWHS-3A	Deep Recess 100° Flat Head Shear Bolt	11-26-90
TWHS-4	Modified Pan Head	11-26-90
TWHS-4A	Deep Recess Modified Pan Head	11-26-90
TWHS-5	Flat Fillister Head	11-26-90
TWHS-5A	Deep Recess Flat Fillister Head	11-26-90
TWHS-6	Washer Faced Trimmed Hexagon Head	11-26-90
TWHS-6A	Deep Recess Washer Face Trimmed Hexagon	11-26-90
TWHS-7	100° Oval Head	11-26-90
TWHS-7A	Deep Recess 100° Oval Head	11-26-90
TWHS-8	Washer Face Indented Hexagon Head	11-26-90

TW 25-1-1

TRI-WING®

SCREW SIZE

00 = 0
02 = 2
04 = 4
06 = 6
10 = 10
25 = 1/4
31 = 5/16
37 = 3/8
43 = 7/16
50 = 1/2
56 = 9/16
62 = 5/8
75 = 3/4
87 = 7/8
100 = 1"

HEAD STYLE

1 = 100° FLAT & FLAT FILL.
2 =
3 = OVAL
4 = STANDARD PAN
5 =
6 = TRUSS CURVED TOP
7 = SPECIAL SINGLE RADIUS CURVED TOP HEAD
8 =
9 = INDENTED HEX
10 = TRIMMED HEX
11 = IMPROVED MODIFIED PAN
12 = MODIFIED PAN

SECOND DASH NO
FOR VARIOUS HEAD
MARKINGS AND/OR
SPECIAL FEATURES

1 = PLAIN
2 = RECESS NO. ENCIRCLED

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TITLE:

**TRI-WING®
PUNCH CODE**

DRAWN:

K. N.

DATE:

11-26-68

DRAWING NUMBER

TWPC-1

CHECKED:

G. LaMONICA

DATE:

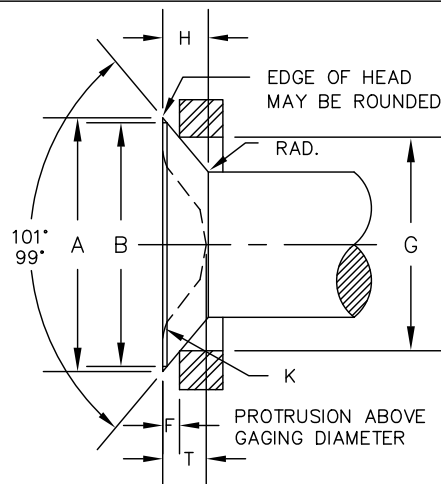
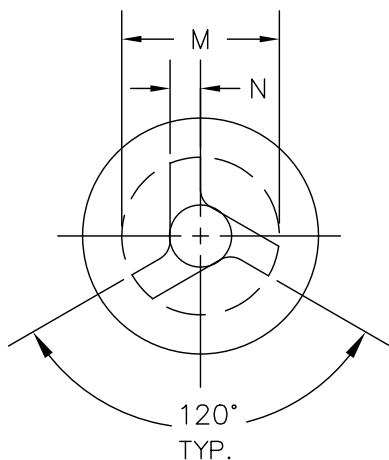
02-24-05

SHEET 1 OF 1

PHILLIPS SCREW CO. 155 FARM STREET, BELLINGHAM, MA 02019 U.S.A.
PHONE: 774-396-6190 FAX: 508-966-2326

PHILLIPS II® PHILLIPS® POZIDRIV® ACR® POZISQUARE® PHILLIPS SQUARE-DRIV® TORQ-SET® TRI-WING® MORTORQ®
HEXSTIX® POZILOCK® ARE REGISTERED TRADEMARKS OF THE PHILLIPS SCREW COMPANY

REVISION
A TWCN 33 6-4-69
B TWCN 42 3-18-71
C REISSUED 11-26-90



RECESS NO.	SCREW SIZE	PUNCH NO.	HEAD DIMENSIONS			RECESS DIMENSIONS						GAGING		DRIVER SIZE
			TO SHARP CORNER A	ABS. MIN. B	H	M	T	MAX RAD. K	MIN. WING WIDTH N	RECESS PENETRATION		G	F	
										MAX.	MIN.			
0	0	TW00-1-1	.119 .109	.096	.022	.082 .072	.030 .022	.005	.0185	.0220	.0135	.074	.019 .014	0
1	2	TW02-1-1	.175 .165	.143	.034	.115 .105	.042 .032		.0225	.0310	.0210	.121	.023 .018	1
2	4	TW04-1-1	.228 .218	.191	.046	.148 .138	.054 .043		.0295	.0400	.0290	.167	.026 .021	2
3	6	TW06-1-1	.279 .269	.238	.057	.182 .172	.066 .054		.0375	.0495	.0370	.214	.028 .022	3
4	8	TW08-1-1	.332 .322	.285	.068	.215 .205	.078 .064	.008	.0425	.0590	.0455	.261	.031 .024	4
5	10	TW10-1-1	.385 .375	.333	.080	.248 .238	.080 .065		.0485	.0520	.0370	.307	.033 .028	5
6	1/4	TW25-1-1	.507 .497	.442	.106	.325 .315	.106 .088		.0605	.0705	.0530	.415	.039 .033	6
7	5/16	TW31-1-1	.635 .625	.556	.133	.395 .385	.140 .120	.010	.0735	.1035	.0830	.526	.047 .040	7
8	3/8	TW37-1-1	.762 .752	.670	.160	.427 .417	.160 .136		.0855	.1260	.1025	.638	.053 .046	8
9	7/16	TW43-1-1	.890 .880	.783	.188	.498 .488	.188 .162	.012	.0975	.1490	.1225	.750	.060 .053	9
10	1/2	TW50-1-1	1.017 1.007	.897	.215	.568 .558	.215 .186		.1095	.1715	.1420	.862	.067 .059	10
11	9/16	TW56-1-1	1.145 1.135	1.011	.242	.638 .628	.242 .210	.014	.1225	.1935	.1610	.974	.073 .065	11
12	5/8	TW62-1-1	1.272 1.262	1.124	.270	.708 .698	.270 .234		.1345	.2175	.1820	1.086	.079 .072	12
13	3/4	TW75-1-1	1.527 1.517	1.352	.324	.880 .870	.335 .294	.018	.1605	.2705	.2290	1.310	.093 .084	13
14	7/8	TW87-1-1	1.782 1.772	1.579	.379	1.120 1.110	.390 .342		.1855	.2880	.2405	1.533	.107 .098	14
15	1"	TW100-1-1	2.037 2.027	1.807	.433	1.260 1.250	.446 .392	.020	.2105	.3280	.2745	1.757	.120 .111	15

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TITLE:

TRI-WING® 100° FLUSH HEAD

DRAWN:
L.P.

DATE:
7-1-68

DRAWING NUMBER

TWHS-1

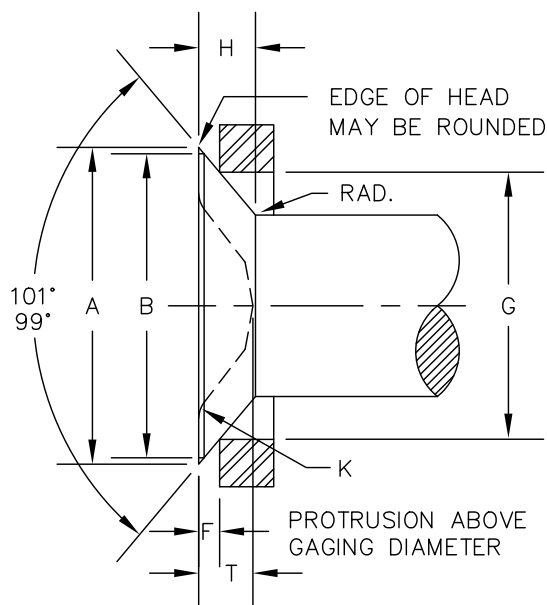
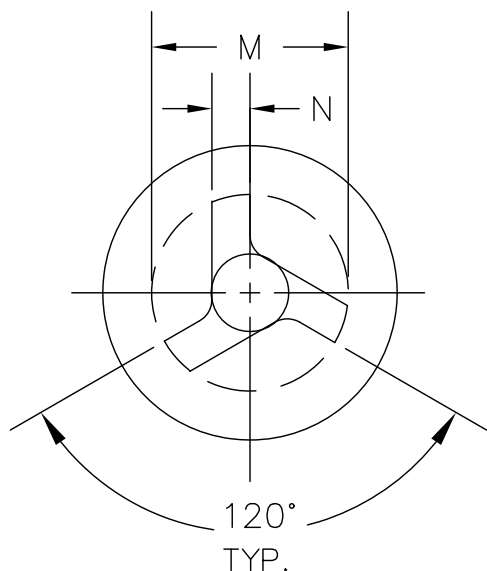
CHECKED:
G. LaMONICA

DATE:
7-10-03

SHEET 1 OF 1

PHILLIPS SCREW CO. 155 FARM STREET, BELLINGHAM, MA 02019 U.S.A.
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RECESS NO.	SCREW SIZE	PUNCH NO.	HEAD DIMENSIONS			RECESS DIMENSIONS						GAGING		DRIVER SIZE
			TO SHARP CORNER A	ABS. MIN. B	H	M	T	MAX RAD. K	MIN. WING WIDTH N	RECESS PENETRATION		G	F	
										MAX.	MIN.			
4	10	TW08-1-135	.381	.338	.082	.248 .238	.094 .079	.008	.0425	.0755	.0605	.3272 .3270	.0223 .0197	4
6	5/16	TW25-1-166	.635	.575	.138	.395 .385	.140 .120	.010	.0605	.1055	.0850	.5451 .5449	.0371 .0337	6

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TITLE:

TRI-WING® DEEP RECESS 100° FLUSH HEAD

DRAWN:

C.M.B.

DATE:

4-15-75

DRAWING NUMBER

TWHS-1A

CHECKED:

G. LaMONICA

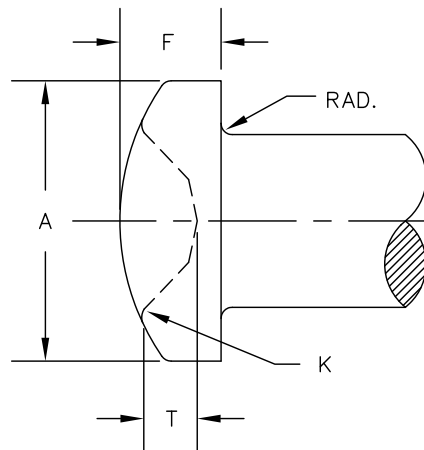
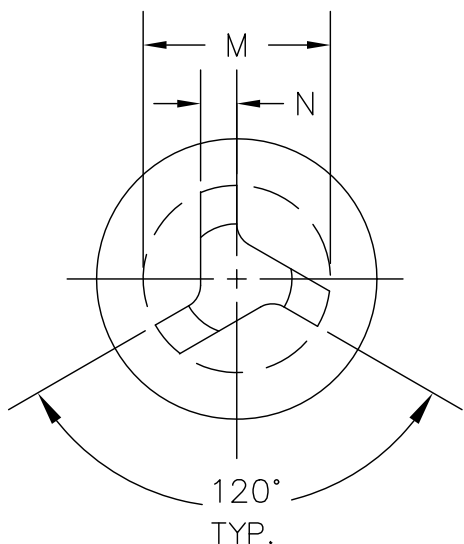
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RECESS NO.	SCREW SIZE	PUNCH NO.	HEAD DIMENSIONS		RECESS DIMENSIONS						DRIVER SIZE
			A	F	M	T	MAX RAD. K	MIN. WING WIDTH N	RECESS PENETRATION		
									MAX.	MIN.	
3	6	TW06-4-1	.270 .256	.097 .087	.160 .150	.055 .043	.005	.0375	.0385	.0260	3
4	8	TW08-4-1	.322 .306	.115 .105	.190 .180	.065 .051	.008	.0425	.0465	.0330	4
5	10	TW10-4-1	.373 .357	.133 .122	.233 .223	.072 .062		.0485	.0445	.0295	5
6	1/4	TW25-4-1	.492 .473	.175 .162	.304 .294	.079 .069		.0605	.0600	.0420	6
7	5/16	TW31-4-1	.615 .594	.218 .203	.359 .349	.122 .112	.010	.0735	.0855	.0650	7
8	3/8	TW37-4-1	.740 .716	.261 .244	.407 .397	.148 .138		.0855	.1160	.0920	8
9	7/16	TW43-4-1	.863 .838	.304 .286	.470 .460	.173 .163	.012	.0975	.1350	.1080	9
10	1/2	TW50-4-1	.987 .958	.348 .327	.536 .526	.197 .187		.1095	.1555	.1260	10

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TITLE:

**TRI-WING®
PAN HEAD**

DRAWN:
K. N.

DATE:
03-29-68

DRAWING NUMBER

TWHS-2

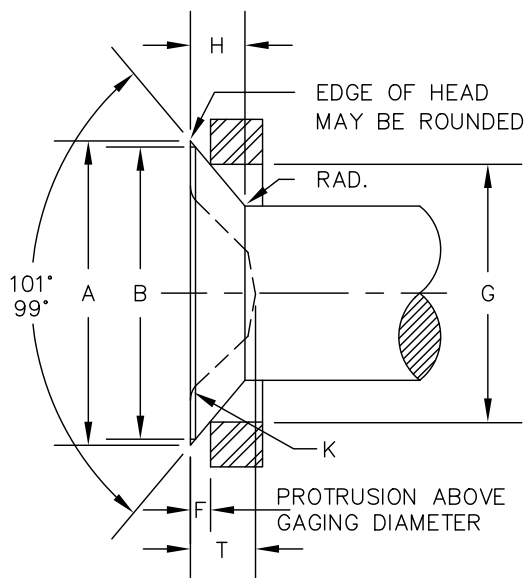
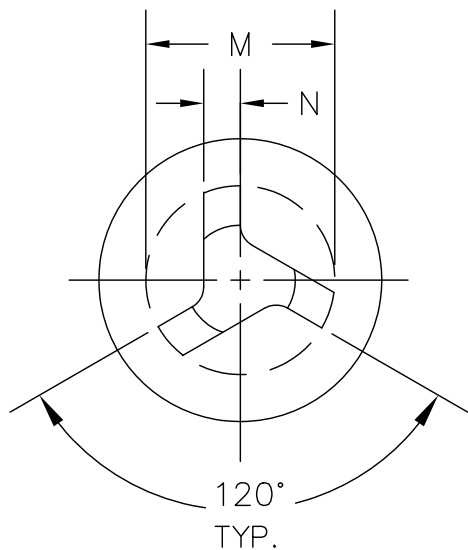
CHECKED:
G. LaMONICA

DATE:
03-28-05

SHEET 1 OF 1

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RECESS NO.	SCREW SIZE	PUNCH NO.	HEAD DIMENSIONS			RECESS DIMENSIONS						GAGING		DRIVER SIZE
			TO SHARP CORNER A	ABS. MIN. B	H	M	T	MAX RAD. K	MIN. WING WIDTH N	RECESS PENETRATION		G	F	
										MAX.	MIN.			
4	10	TW08—1—1	.303	.266	.049	.215 .205	.078 .064	.008	.0425	.0590	.0455	.2440 .2438	.0243 .0217	4
5	1/4	TW10—1—1	.397	.355	.063	.248 .238	.080 .065		.0485	.0520	.0370	.3314 .3312	.0270 .0240	5
6	5/16	TW25—1—1	.477	.429	.071	.325 .315	.106 .088		.0605	.0705	.0530	.4047 .4045	.0305 .0255	6
7	3/8	TW31—1—1	.564	.510	.081	.395 .385	.140 .120	.010	.0735	.1035	.0830	.4854 .4852	.0324 .0285	7

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TITLE:

TRI-WING® 100° FLAT HEAD SHEAR BOLT

DRAWN:

K. N.

DATE:

03-29-68

DRAWING NUMBER

TWHS-3

CHECKED:

G. LaMONICA

DATE:

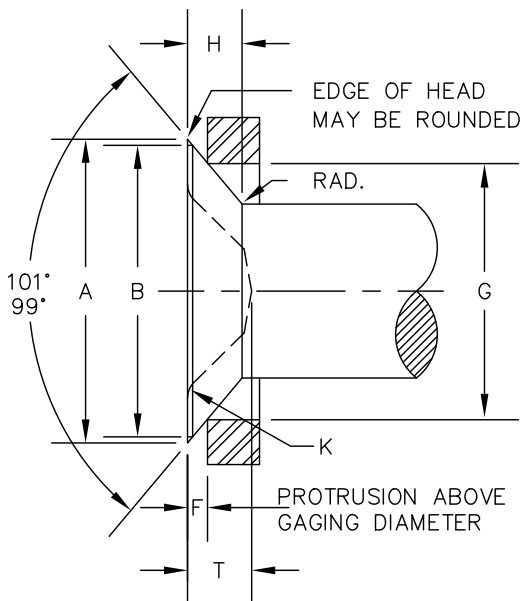
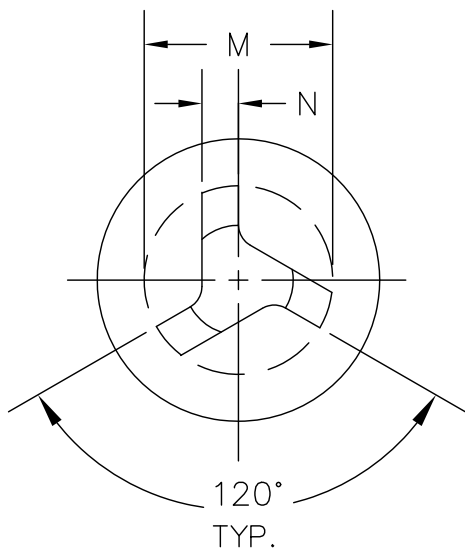
03-28-05

SHEET 1 OF 1

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PHONE: 774-396-6190 FAX: 508-966-2326

PHILLIPS II® PHILLIPS® POZIDRIV® ACR® POZISQUARE® PHILLIPS SQUARE-DRIV® TORQ-SET® TRI-WING® MORTORQ®
HEXSTIX® POZILOCK® ARE REGISTERED TRADEMARKS OF THE PHILLIPS SCREW COMPANY



RECESS NO.	SCREW SIZE	PUNCH NO.	HEAD DIMENSIONS			RECESS DIMENSIONS						GAGING		DRIVER SIZE
			TO SHARP CORNER A	ABS. MIN. B	H	M	T	MAX RAD. K	MIN. WING WIDTH N	RECESS PENETRATION		G	F	
										MAX.	MIN.			
4	1/4	TW08-1-135	.397	.355	.063	.248 .238	.094 .079	.008	.0425	.0755	.0605	.3314 .3312	.0270 .0240	4
6	3/8	TW25-1-166	.564	.510	.081	.395 .385	.140 .120	.010	.0605	.1055	.0850	.4854 .4852	.0324 .0286	6

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TITLE:

TRI-WING® DEEP RECESS 100° FLAT HEAD SHEAR BOLT

DRAWN:

C. M. B.

DATE:

4-15-75

DRAWING NUMBER

TWHS-3A

CHECKED:

G. LaMONICA

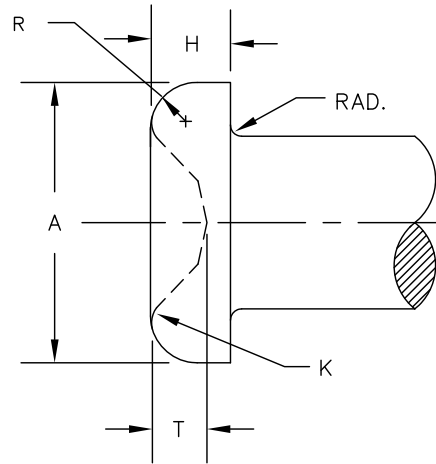
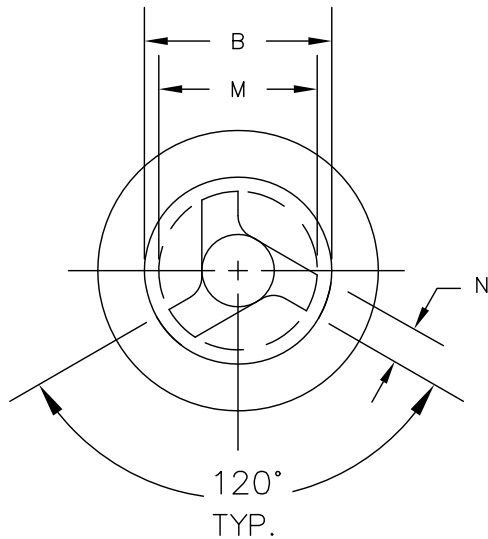
DATE:

7-10-03

SHEET 1 OF 1

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RECESS NO.	SCREW SIZE	PUNCH NO.	HEAD DIMENSIONS				RECESS DIMENSIONS						DRIVER SIZE
			A	FLAT DIA. REF. B	H	R	M	T	MAX RAD. K	MIN. WING WIDTH N	RECESS PENETRATION		
											MAX.	MIN.	
0	0	TW00-11-1	.116 .104	.089	.037 .029	.008	.082 .072	.030 .022	.005	.0185	.0220	.0135	0
1	2	TW02-11-1	.167 .155	.122	.053 .044	.017	.115 .105	.042 .032		.0225	.0310	.0210	1
2	4	TW04-11-1	.219 .205	.155	.069 .059	.027	.148 .138	.054 .043		.0295	.0400	.0290	2
3	6	TW06-11-1	.270 .256	.189	.086 .074	.035	.182 .172	.066 .054		.0375	.0495	.0370	3
4	8	TW08-11-1	.322 .306	.228	.102 .088	.042	.215 .205	.078 .064	.008	.0425	.0590	.0455	4
5	10	TW10-11-1	.373 .357	.261	.118 .103	.051	.248 .238	.080 .065		.0485	.0520	.0370	5
6	1/4	TW25-12-1	.492 .473	.320	.150 .133	.076	.304 .294	.095 .078		.0605	.0600	.0420	6
7	5/16	TW31-12-1	.615 .594	.379	.183 .162	.108	.359 .349	.121 .101	.010	.0735	.0855	.0650	7
8	3/8	TW37-12-1	.740 .716	.427	.215 .191	.144	.407 .397	.149 .126		.0855	.1160	.0925	8
9	7/16	TW43-12-1	.863 .838	.494	.248 .221	.172	.470 .460	.173 .146	.012	.0975	.1350	.1085	9
10	1/2	TW50-12-1	.987 .958	.560	.280 .250	.199	.536 .526	.198 .168		.1095	.1555	.1260	10

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	B. TWCN 42	3-18-71
	C. REISSUED	11-26-90

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TITLE:

TRI-WING® MODIFIED PAN HEAD

DRAWN:
C. M. B.

DATE:
8-9-68

DRAWING NUMBER

TWHS-4

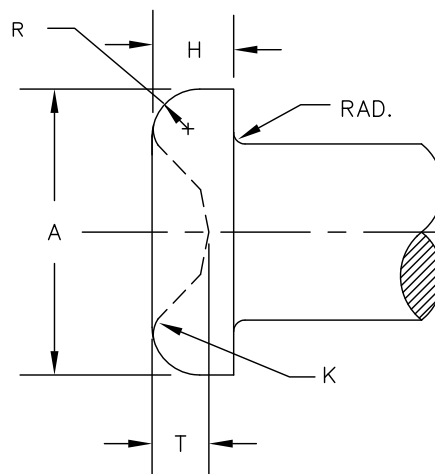
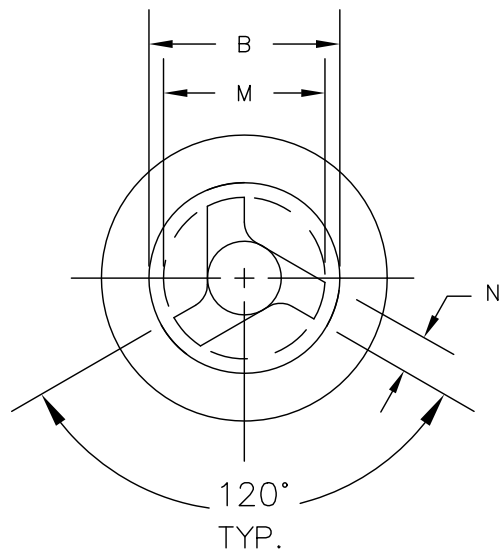
CHECKED:
G. LaMONICA

DATE:
7-10-03

SHEET 1 OF 1

PHILLIPS SCREW CO. 155 FARM STREET, BELLINGHAM, MA 02019 U.S.A.
PHONE: 774-396-6190 FAX: 508-966-2326

PHILLIPS II® PHILLIPS® POZIDRIV® ACR® POZISQUARE® PHILLIPS SQUARE-DRIV® TORQ-SET® TRI-WING® MORTORQ®
HEXSTIX® POZILOCK® ARE REGISTERED TRADEMARKS OF THE PHILLIPS SCREW COMPANY



RECESS NO.	SCREW SIZE	PUNCH NO.	HEAD DIMENSIONS				RECESS DIMENSIONS						DRIVER SIZE
			A	FLAT DIA. REF. B	H	R	M	T	MAX RAD. K	MIN. WING WIDTH N	RECESS PENETRATION		
											MAX.	MIN.	
4	10	TW08-11-2	.373 .357	.261	.118 .103	.064 .054	.248 .238	.094 .079	.008	.0425	.0755	.0605	4
6	5/16	TW25-12-94	.615 .594	.379	.183 .162	.118 .108	.359 .349	.122 .102	.010	.0605	.0875	.0670	6

REVISION
A REISSUED
11-26-90

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TITLE:

TRI-WING® DEEP RECESS MODIFIED PAN HEAD

DRAWN:

C. M. B.

DATE:

4-16-75

DRAWING NUMBER

TWHS-4A

CHECKED:

G. LaMONICA

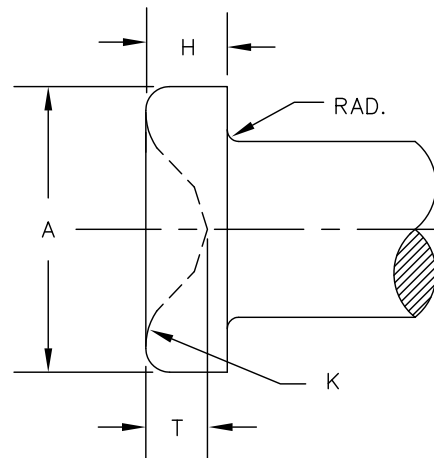
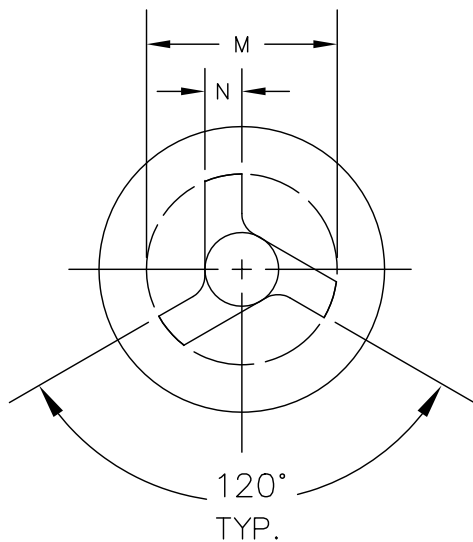
DATE:

7-10-03

SHEET 1 OF 1

PHILLIPS SCREW CO. 155 FARM STREET, BELLINGHAM, MA 02019 U.S.A.
PHONE: 774-396-6190 FAX: 508-966-2326

PHILLIPS II® PHILLIPS® POZIDRIV® ACR® POZISQUARE® PHILLIPS SQUARE-DRIV® TORQ-SET® TRI-WING® MORTORQ®
HEXSTIX® POZILOCK® ARE REGISTERED TRADEMARKS OF THE PHILLIPS SCREW COMPANY



RECESS NO.	SCREW SIZE	PUNCH NO.	HEAD DIMENSIONS		RECESS DIMENSIONS						DRIVER SIZE
			A	H	M	T	MAX RAD. K	MIN. WING WIDTH N	RECESS PENETRATION		
									MAX.	MIN.	
0	0	TW00-1-1	.096 .092	.037 .029	.082 .072	.030 .022	.005	.0185	.0220	.0135	0
1	2	TW02-1-1	.140 .136	.053 .044	.115 .105	.042 .032		.0225	.0310	.0210	1
2	4	TW04-1-1	.183 .178	.069 .059	.148 .138	.054 .043		.0295	.0400	.0290	2
3	6	TW06-1-1	.226 .221	.086 .074	.182 .172	.066 .054		.0375	.0495	.0370	3
4	8	TW08-1-1	.270 .265	.102 .088	.215 .205	.078 .064	.008	.0425	.0590	.0455	4
5	10	TW10-1-1	.313 .306	.118 .103	.248 .238	.080 .065		.0485	.0520	.0370	5
6	1/4	TW25-1-1	.375 .367	.150 .133	.325 .315	.106 .088		.0605	.0705	.0530	6
7	5/16	TW31-1-1	.438 .429	.183 .162	.395 .385	.140 .120	.010	.0735	.1035	.0830	7
8	3/8	TW37-1-1	.563 .552	.215 .191	.427 .417	.160 .136		.0855	.1260	.1025	8
9	7/16	TW43-1-1	.625 .615	.248 .221	.498 .488	.188 .162	.012	.0975	.1490	.1225	9
10	1/2	TW50-1-1	.750 .739	.280 .250	.568 .558	.215 .186		.1095	.1715	.1420	10

REVISION	A	TWCN 21	4-10-68
	B	TWCN 24	10-16-68
	C	REISSUED	11-26-90

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TITLE:

TRI-WING® FLAT FILLISTER HEAD

DRAWN:
K. N.

DATE:
8-23-68

DRAWING NUMBER

TWHS-5

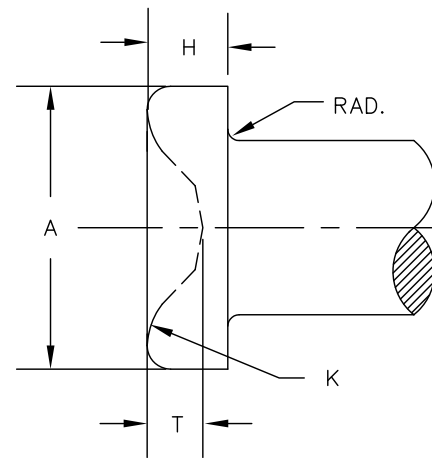
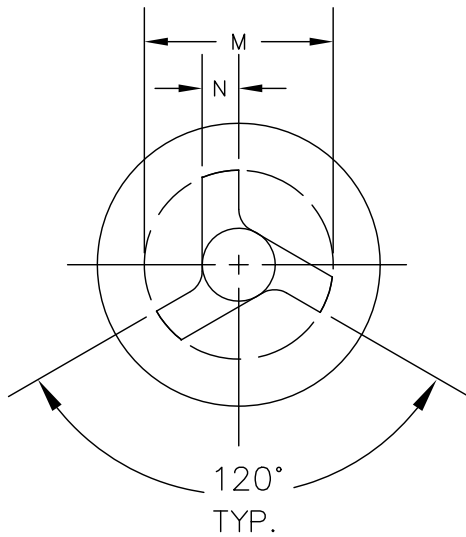
CHECKED:
G. LEMONICA

DATE:
7-10-03

SHEET 1 OF 1

PHILLIPS SCREW CO. 155 FARM STREET, BELLINGHAM, MA 02019 U.S.A.
PHONE: 774-396-6190 FAX: 508-966-2326

PHILLIPS II® PHILLIPS® POZIDRIV® ACR® POZISQUARE® PHILLIPS SQUARE-DRIV® TORQ-SET® TRI-WING® MORTORQ®
HEXSTIX® POZILOCK® ARE REGISTERED TRADEMARKS OF THE PHILLIPS SCREW COMPANY



RECESS NO.	SCREW SIZE	PUNCH NO.	HEAD DIMENSIONS		RECESS DIMENSIONS						DRIVER SIZE
			A	H	M	T	MAX RAD. K	MIN. WING WIDTH N	RECESS PENETRATION		
									MAX.	MIN.	
4	10	TW08—1—135	.313 .306	.118 .103	.248 .238	.094 .079	.008	.0425	.0755	.0605	4
6	5/16	TW25—1—166	.438 .429	.183 .162	.395 .385	.140 .120	.010	.0605	.1055	.0850	6

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11-26-90

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TITLE:

TRI-WING® DEEP RECESS FLAT FILLISTER HEAD

DRAWN:
C. M. B.

DATE:
4-16-75

DRAWING NUMBER

TWHS-5A

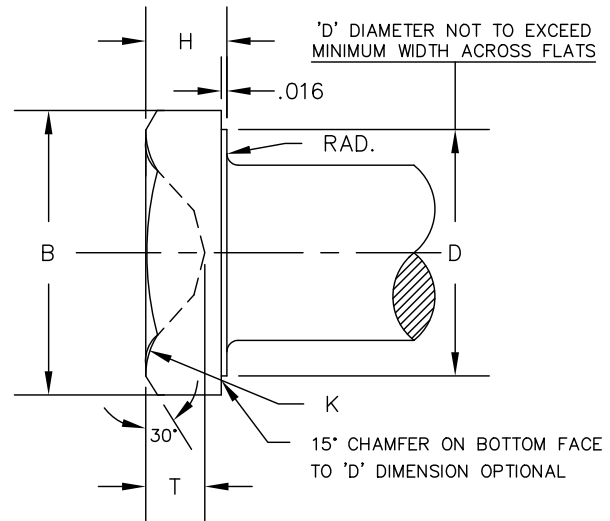
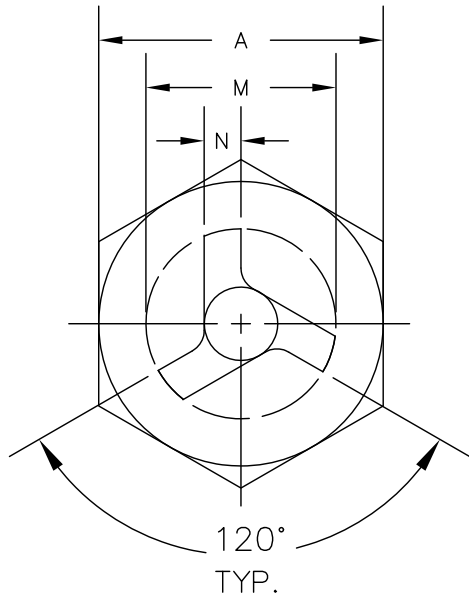
CHECKED:
G. LaMONICA

DATE:
7-10-03

SHEET 1 OF 1

PHILLIPS SCREW CO. 155 FARM STREET, BELLINGHAM, MA 02019 U.S.A.
PHONE: 774-396-6190 FAX: 508-966-2326

PHILLIPS II® PHILLIPS® POZIDRIV® ACR® POZISQUARE® PHILLIPS SQUARE-DRIV® TORQ-SET® TRI-WING® MORTORQ®
HEXSTIX® POZILOCK® ARE REGISTERED TRADEMARKS OF THE PHILLIPS SCREW COMPANY



RECESS NO.	SCREW SIZE	PUNCH NO.	HEAD DIMENSIONS				RECESS DIMENSIONS						DRIVER SIZE
			A	REF. B	MIN. D	H	M	T	MAX RAD. K	MIN. WING WIDTH N	RECESS PENETRATION		
											MAX.	MIN.	
2	4	TW04-10-1	.187 .181	.202	.171	.060 .049	.148 .138	.054 .043	.005	.0295	.0400	.0290	2
3	6	TW06-10-1	.250 .244	.272	.234	.093 .080	.182 .172	.066 .054		.0375	.0495	.0370	3
4	8	TW08-10-1				.110 .096	.215 .205	.078 .064	.008	.0425	.0590	.0455	4
5	10	TW10-10-1	.312 .305	.340	.295	.120 .105	.248 .238	.080 .065		.0485	.0520	.0370	5

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11-26-90

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TITLE:

TRI-WING® **WASHER FACE TRIMMED HEX. HEAD**

DRAWN:

K. N.

DATE:

8-23-68

DRAWING NUMBER

TWHS-6

CHECKED:

G. LaMONICA

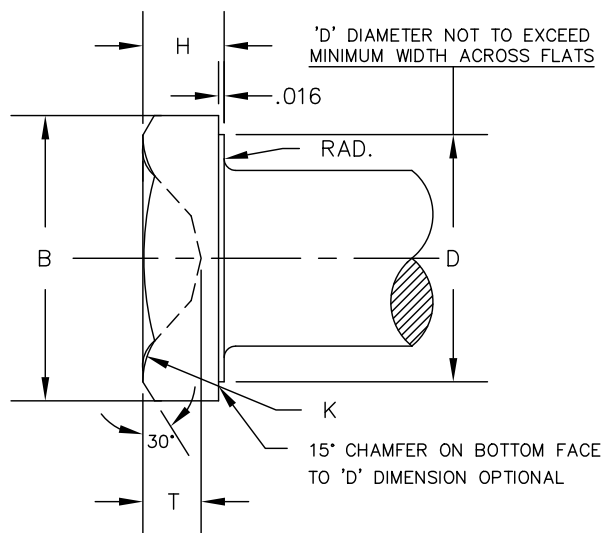
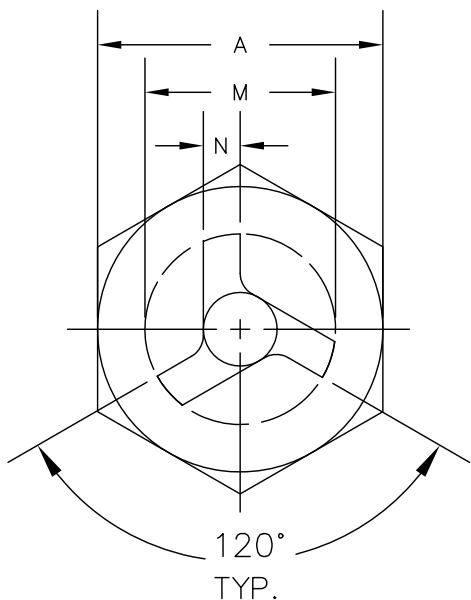
DATE:

7-10-03

SHEET 1 OF 1

PHILLIPS SCREW CO. 155 FARM STREET, BELLINGHAM, MA 02019 U.S.A.
PHONE: 774-396-6190 FAX: 508-966-2326

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HEXSTIX® POZILOCK® ARE REGISTERED TRADEMARKS OF THE PHILLIPS SCREW COMPANY



RECESS NO.	SCREW SIZE	PUNCH NO.	HEAD DIMENSIONS				RECESS DIMENSIONS						DRIVER SIZE
			A	REF. B	MIN. D	H	M	T	MAX RAD. K	MIN. WING WIDTH N	RECESS PENETRATION		
											MAX.	MIN.	
4	10	TW08-10-35	.313 .305	.339	.275	.120 .105	.248 .238	.094 .079	.008	.0425	.0755	.0605	4

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11-26-90

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TITLE:

TRI-WING® DEEP RECESS WASHER FACE TRIMMED HEX. HEAD

DRAWN:

C. M. B.

DATE:

4-16-75

DRAWING NUMBER

TWHS-6A

CHECKED:

G. LaMONICA

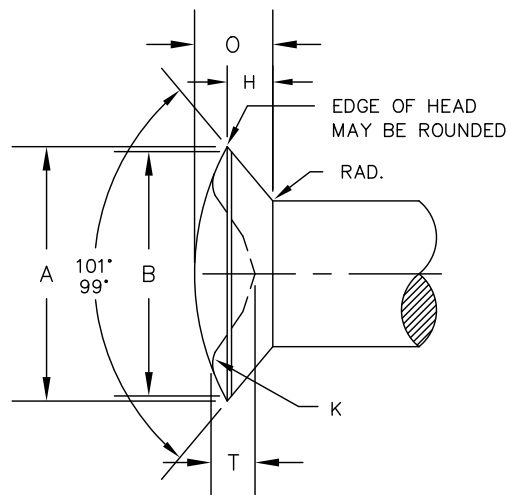
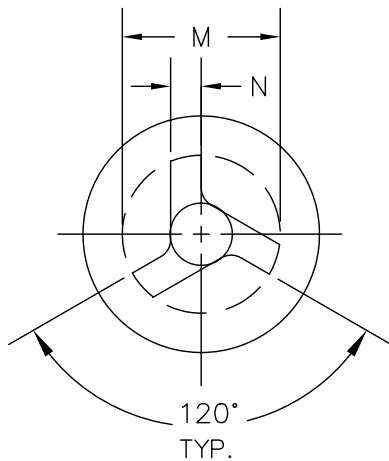
DATE:

7-10-03

SHEET 1 OF 1

PHILLIPS SCREW CO. 155 FARM STREET, BELLINGHAM, MA 02019 U.S.A.
PHONE: 774-396-6190 FAX: 508-966-2326

PHILLIPS II® PHILLIPS® POZIDRIV® ACR® POZISQUARE® PHILLIPS SQUARE-DRIV® TORQ-SET® TRI-WING® MORTORQ®
HEXSTIX® POZILOCK® ARE REGISTERED TRADEMARKS OF THE PHILLIPS SCREW COMPANY



RECESS NO.	SCREW SIZE	PUNCH NO.	HEAD DIMENSIONS				RECESS DIMENSIONS						DRIVER SIZE
			MAX. SHARP A	METAL TO METAL B	REF. H	MAX. REF. O	M	T	MAX RAD. K	MIN. WING WIDTH N	RECESS PENETRATION		
											MAX.	MIN.	
2	4	TW04-3-1	.225	.218 .204	.049	.085	.148 .138	.054 .043	.005	.0295	.0415	.0305	2
3	6	TW06-3-1	.279	.269 .255	.060	.105	.182 .172	.066 .054		.0375	.0520	.0395	3
4	8	TW08-3-1	.334	.323 .307	.072	.124	.215 .205	.078 .065	.008	.0425	.0620	.0485	4
5	10	TW10-3-1	.383	.371 .355	.083	.143	.248 .238	.080 .065		.0485	.0535	.0385	5
6	1/4	TW25-3-1	.510	.495 .476	.110	.189	.325 .315	.105 .087	.010	.0605	.0730	.0550	6
7	5/16	TW31-3-1	.637	.619 .598	.138	.237	.395 .385	.139 .118		.0735	.1080	.0870	7
8	3/8	TW37-3-1	.765	.744 .720	.165	.282	.427 .417	.159 .135		.0855	.1280	.1040	8

NOTE: (1) ALTHOUGH RECESS DIA. "M" IS THE SAME AS 100° FLUSH HEADS, RECESS PENETRATION VALUES ARE LARGER DUE TO THE INFLUENCE OF THE C'BORE DIA. "B" OF THE TWG-1 PENETRATION GAGE BODY.

REVISION
A TWCN 24 10-15-68
B TWCN 37 6-4-70
C REISSUED 11-26-90

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TITLE:

TRI-WING®
100° OVAL HEAD

DRAWN:

L. A. P.

DATE:

10-10-68

DRAWING NUMBER

TWHS-7

CHECKED:

G. LaMONICA

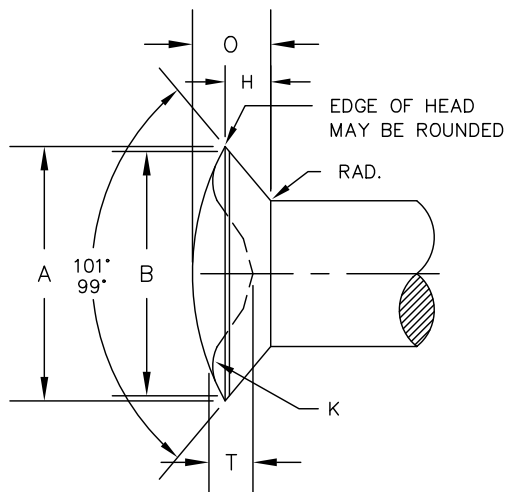
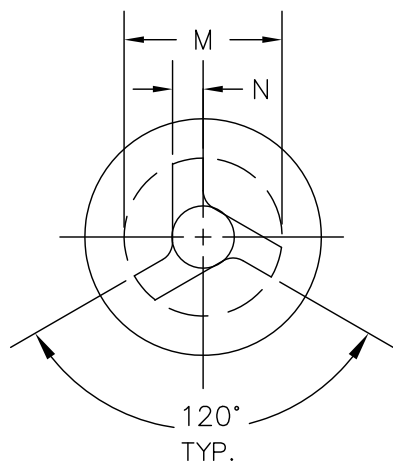
DATE:

7-10-03

SHEET 1 OF 1

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PHONE: 774-396-6190 FAX: 508-966-2326

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RECESS NO.	SCREW SIZE	PUNCH NO.	HEAD DIMENSIONS				RECESS DIMENSIONS						DRIVER SIZE
			MAX. SHARP A	METAL TO METAL B	REF. H	MAX. REF. O	M	T	MAX RAD. K	MIN. WING WIDTH N	RECESS PENETRATION		
											MAX.	MIN.	
4	10	TW08—3—10	.381	.338	.082	.143	.248 .238	.101 .086	.008	.0425	.0825	.0675	4
6	5/16	TW25—3—4	.635	.575	.138	.237	.395 .385	.140 .120	.010	.0605	.1165	.0960	6

NOTE: (1) ALTHOUGH RECESS DIA. "M" IS THE SAME AS 100° FLUSH HEADS, RECESS PENETRATION VALUES ARE LARGER DUE TO THE INFLUENCE OF THE C'BORE DIA. "B" OF THE TWG-1 PENETRATION GAGE BODY.

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TITLE:

TRI-WING® DEEP RECESS 100° OVAL HEAD

DRAWN:

C. M. B.

DATE:

4-16-75

DRAWING NUMBER

TWHS-7A

CHECKED:

G. LaMONICA

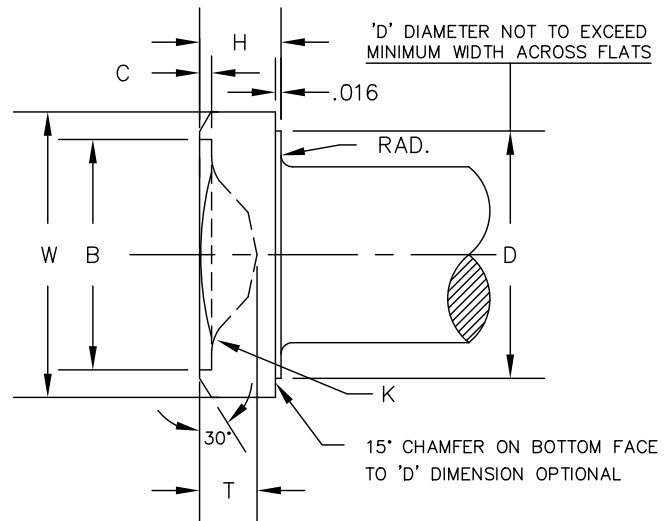
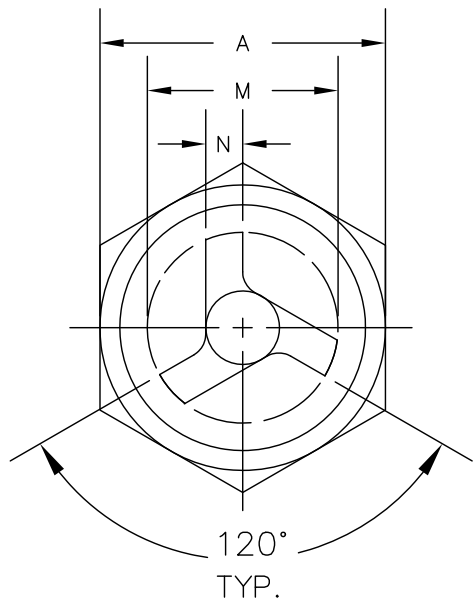
DATE:

7-10-03

SHEET 1 OF 1

PHILLIPS SCREW CO. 155 FARM STREET, BELLINGHAM, MA 02019 U.S.A.
PHONE: 774-396-6190 FAX: 508-966-2326

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HEXSTIX® POZILOCK® ARE REGISTERED TRADEMARKS OF THE PHILLIPS SCREW COMPANY



RECESS NO.	SCREW SIZE	PUNCH NO.	HEAD DIMENSIONS						RECESS DIMENSIONS						DRIVER SIZE
			A	REF.	REF.	MIN.	H	REF.	M	T	MAX RAD. K	MIN. WING WIDTH N	RECESS PENETRATION		
				B	C	D		W					MAX.	MIN.	
2	4	TW04-9-1	.187 .181	.153	.008	.171	.060 .049	.202	.140 .130	.060 .049	.005	.0295	.0460	.0350	2
3	6	TW06-9-1	.250 .244	.210	.012	.234	.093 .080	.272	.182 .172	.080 .068		.0375	.0635	.0510	3
4	8	TW08-9-1			.018		.110 .096		.192 .182	.091 .079	.008	.0425	.0675	.0550	4
5	10	TW10-9-1	.312 .305	.270	.020	.295		.120 .105	.340	.248 .238		.102 .087	.0485	.0740	.0590

NOTE: (1) RECESS DEPTH "T", AND RECESS PENETRATION GAGING DEPTHS ARE MEASURED FROM TOP SURFACE OF HEAD AND INCLUDE "C" MAXIMUM ON TOOLING.

NOT A PREFERRED HEX. STANDARD

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A REISSUED
11-26-90

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TITLE:

TRI-WING®
WASHER FACE INDENTED HEX. HEAD

DRAWN:

L. A. P.

DATE:

10-16-68

DRAWING NUMBER

TWHS-8

CHECKED:

G. LaMONICA

DATE:

7-10-03

SHEET 1 OF 1

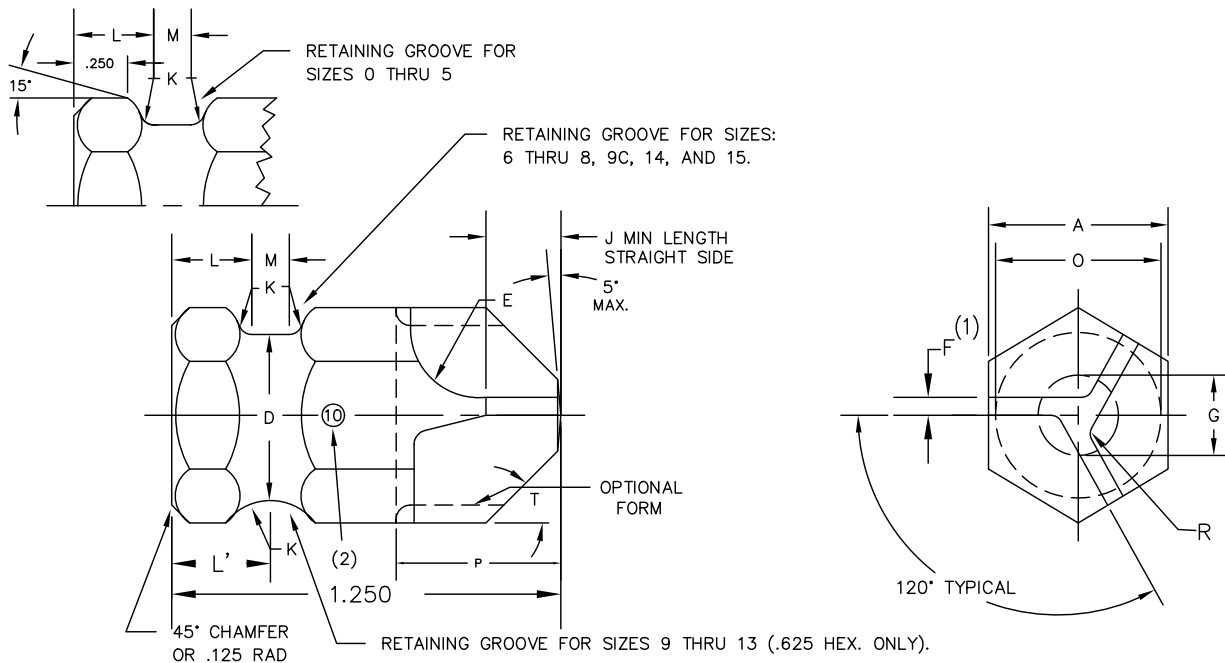
PHILLIPS SCREW CO. 155 FARM STREET, BELLINGHAM, MA 02019 U.S.A.
PHONE: 774-396-6190 FAX: 508-966-2326

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4/16/75
11/26/90
02/23/05

TRI-WING[®] ENGINEERING MANUAL **BITS & DRIVERS**

<u>SHEET NUMBER</u>	<u>DESCRIPTION</u>	<u>DATE</u>
TWD-1	Insert Bits Sheet 1	02/11/91
TWD-1	Insert Bits Sheet 2	02/11/91
TWD-1	Driver Bits, Square Drive Sheet 3	11/26/90
TWD-2	Hand Screw Driver	11/26/90
TWD-3	Driver Torsional and Fatigue Test Blocks	10/05/92
TWD-4	Insert Bits Sheet 1	11/26/90
TWD-4	Insert Bits Sheet 2	11/26/90
TWD-5	Bit For Minimum Clearance Applications	11/26/90
TWD-6	Long Shank Insert Bits	11/26/90
TWD-7	Long Shank Insert Bits	11/26/90
TWD-8	Long Shank Insert Bits	11/26/90
TWD-9	Long Shank Insert Bits	11/26/90



NOTE: (1) DRIVING WALLS MUST BE WITHIN .0005 OF 120° CENTERLINE.
(2) DRIVER BITS TO BE MARKED WITH RECESS NUMBER ENCIRCLED APPROX. 1/16" HIGH.

RECESS NUMBER	DRIVER SIZE	HEX. A +.000 −.004	E RAD.	F	G ±.001	J	R	O DIA.	T	P MIN.	D	L	L'	M	K RAD.	45° CHAMFER
0	0	.250	.125	.0180 .0170	.038	.047	.005 .000	.185 .180	46°00' 45°30'	.188	.188	.375	—	.062	.094	TO .203 DIA.
1	1			.0220 .0210	.053	.062	.006 .001			.203						
2	2			.0290 .0280	.068	.078	.010 .005			.219						
3	3			.0370 .0360	.083	.094	.020 .015		46°30' 45°30'	.250						
4	4		.0420 .0410	.097	.025 .020		.247 .242									
5	5		.438	.188		.0480 .0470	.144	.109	.434 .429	46° 45°						
6	6	.0600 .0585			.184	.125	.438 .437	.375								
7	7	.0730 .0715			.188	.141										
8	8	.625	.250	.0850 .0835	.175	.172	.030 .025	.622 .617	.438 .437	.531	—	.344	—	.172	TO .578 DIA.	
9	9			.0970 .0955	.200											
10	10			.1090 .1075	.225	.203										.048 .043
11	11	.1220 .1200	.251	.219												

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TITLE:

TRI-WING® INSERT BITS

DRAWN:

K. N.

DATE:

03-12-68

DRAWING NUMBER

TWD-1

CHECKED:

G. LaMONICA

DATE:

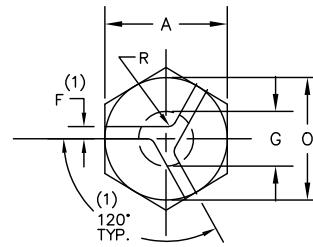
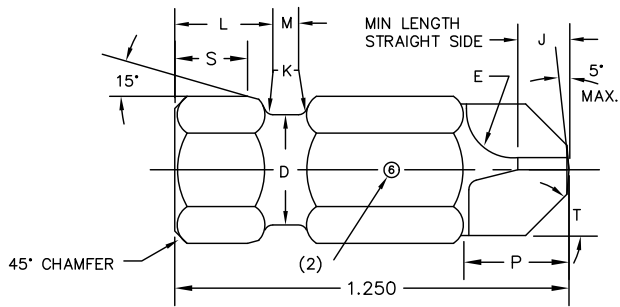
02-23-05

SHEET 1 OF 3

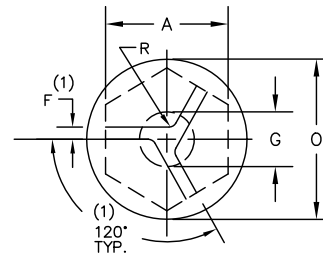
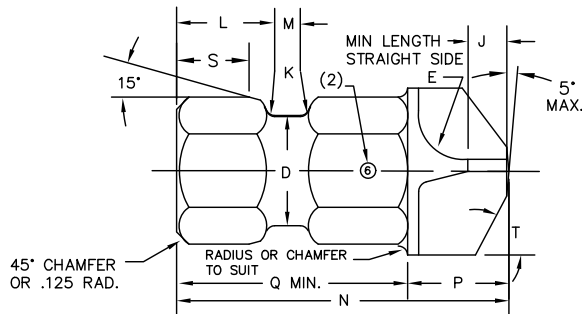
PHILLIPS SCREW CO. 155 FARM STREET, BELLINGHAM, MA 02019 U.S.A.
PHONE: 774-396-6190 FAX: 508-966-2326

PHILLIPS II® PHILLIPS® POZIDRIV® ACR® POZISQUARE® PHILLIPS SQUARE-DRIV® TORQ-SET® TRI-WING® MORTORQ®
HEXSTIX® POZILOCK® ARE REGISTERED TRADEMARKS OF THE PHILLIPS SCREW COMPANY

REVISION
A TWCN 3 3-29-68
B TWCN 7 4-23-68
C TWCN 14 7-3-68
D TWCN 15 7-9-68
E TWCN 21 9-11-68
F TWCN 26 10-29-68
G TWCN 38 6-23-70
H REISSUED 11-26-90
I/ ECO 69 12-26-90
2/ ECO 70 2-11-91



RECESS NUMBER	DRIVER SIZE	A +.000 -.004	E RAD.	F ±.001	G ±.001	J	R	O DIA.	T	P MIN.	D	L	S REF.	M	K RAD.	45° CHAMFER
4	4A	.312	.125	.0420 .0410	.097	.094	.025	.309	46°30' 45°30'	.250	.250	.406	.281	.062	.094	TO .266 DIA.
5	5A			.0480 .0470	.144	.109	.020	.304								



RECESS NUMBER	DRIVER SIZE	A +.000 -.004	E RAD.	F	G ±.001	J	R	O DIA.	T	P MIN.	D	L	S REF.	M	K RAD.	Q	N	45° CHAMFER											
6	6A	.312	.188	.0600 .0585	.184	.125	.025	.437	46° 45°	.375	.250	.406	.281	.062	.094	.625	1.250	TO .266 DIA.											
7	7A			.0730 .0715	.188	.141	.020	.429		.438																			
8	8A			.0850 .0835	.175	.172	.030 .025	.504 .496																					
6	6B	.250	.188	.0600 .0585	.184	.125	.025	.437		.375	.188	.375	.250	.047	.109	.625	1.250	TO .203 DIA.											
7	7B			.0730 .0715	.188	.141	.020	.429		.438																			
8	8B			.0850 .0835	.175	.172	.030 .025	.504 .496																					
9	9C	.438	.250	.0970 .0955	.200	.250	.060 .055	.754 .746		.438	.344	.250	—	—	.172	.625	1.250	TO .391 DIA.											
12	12	.625		.1340 .1320	.273													.312	.060 .055	1.005 .995	.812	.531	.344	—	—	.156	1.625	2.500	TO .578 DIA.
13	13		.500			.1600 .1580	.339	.375		.078 .073	1.255 1.245	1.062	.656	.312	—	.062	3.000												TO .703 DIA.
14	14																												
15	15	.2100 .2080	.604																										

- (1) DRIVING WING WALLS MUST BE WITHIN .0005 OF 120° CENTERLINE.
(2) DRIVER BITS TO BE MARKED WITH RECESS NUMBER ENCIRCLED IN LETTERS APPROX. 1/16" HIGH.

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TITLE:

TRI-WING® INSERT BITS

DRAWN:

K. N.

DATE:

03-12-68

DRAWING NUMBER

TWD-1

CHECKED:

G. LaMONICA

DATE:

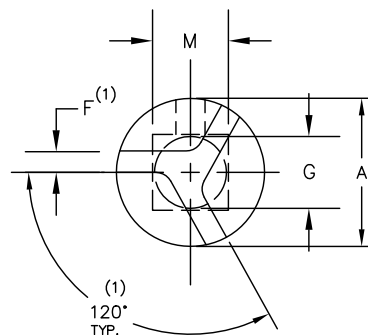
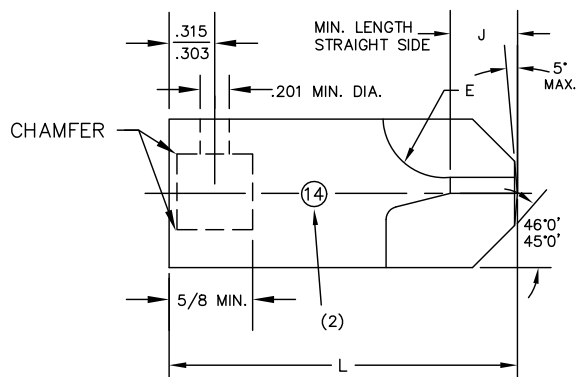
02-23-05

SHEET 2 OF 3

PHILLIPS SCREW CO. 155 FARM STREET, BELLINGHAM, MA 02019 U.S.A.
PHONE: 774-396-6190 FAX: 508-966-2326

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HEXSTIX® POZILOCK® ARE REGISTERED TRADEMARKS OF THE PHILLIPS SCREW COMPANY

REVISION
A TWCN 3 B TWCN 7 C TWCN 14 D TWCN 15 E TWCN 21 F TWCN 26 G TWCN 38 H REISSUED 1/ ECO 69 2/ ECO 70
3-29-68 4-23-68 7-3-68 7-9-68 9-11-68 10-29-68 6-23-70 11-26-90 12-26-90 2-11-91



NOTE: (1) DRIVING WALLS MUST BE WITHIN .0005 OF 120° CENTERLINE.

(2) DRIVER BITS TO BE MARKED WITH RECESS NUMBER ENCIRCLED APPROX. 1/16" HIGH.

RECESS NUMBER	DRIVER SIZE	A +.000 -.004	E RAD.	F ±.001	G ±.001	J	R DIA.	L	M
12	12S	.875	.312	.1340 .1320	.273	.250	.060 .055	2.000	.508 .503
13	13S			.1600 .1580	.339	.312			
14	14S	1.250	.500	.1850 .1830	.544	.375	.078 .073	2.250	.633 .628
15	15S			.2100 .2080	.604	.438			

E REISSUED
11-26-90

D TCN 26
10-29-68

C TCN 15
7-9-68

B TCN 14
7-3-68

A TCN 12
5-29-68

REVISION

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TITLE:

TRI-WING® INSERT BITS (SQUARE DRIVE)

DRAWN:
K. N.

DATE:
03-12-68

DRAWING NUMBER

TWD-1

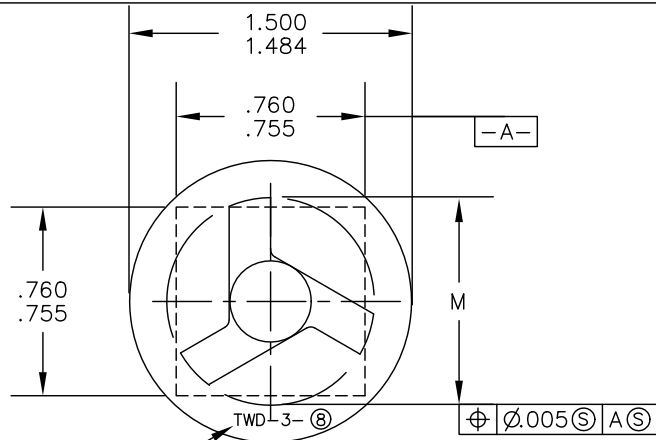
CHECKED:
G. LaMONICA

DATE:
02-23-05

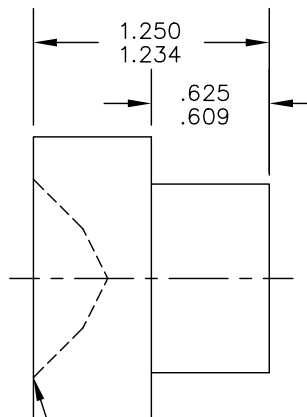
SHEET 3 OF 3

PHILLIPS SCREW CO. 155 FARM STREET, BELLINGHAM, MA 02019 U.S.A.
PHONE: 774-396-6190 FAX: 508-966-2326

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HEXSTIX® POZILOCK® ARE REGISTERED TRADEMARKS OF THE PHILLIPS SCREW COMPANY

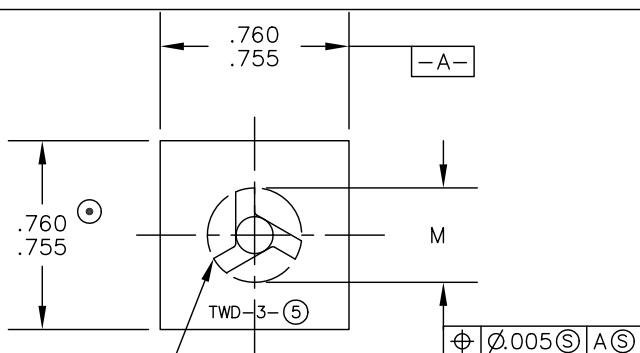


EXAMPLE OF PART NO.
METHOD OF MARKING OPTIONAL

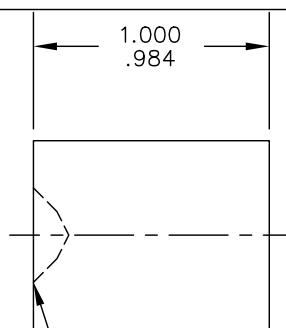


"P" RAD. TYPICAL
REF. DWG. TWP-11.

STYLE B



PUNCHES LISTED ON
TWP-11 CAN BE USED
TO FORM RECESS.



"P" RAD. TYPICAL
REF. DWG. TWP-11.

STYLE A

	RECESS NUMBER															
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
STYLE	A								B							
$\pm .005$ M	.077	.110	.143	.177	.210	.243	.320	.390	.422	.493	.563	.633	.703	.875	1.115	1.255
MINIMUM TORQUE STRENGTH (1)	---	---	---	40	75	110	300	450	700	1050	1300	1780	2580	---	---	---

NOTE 1 - SUFFICIENT END LOAD (10-20 POUNDS) MUST BE APPLIED TO THE BIT TO INSURE POSITIVE SEATING IN THE RECESS, AND TO PREVENT AXIAL MOVEMENT DURING THE APPLICATION OF TORQUE.

NOTE 2 - MATERIAL: A2 OR EQUIVALENT
HEAT TREAT: Rc 61-63

REVISION
A TWCN 43 5-17-71
B TWCN 44 6-15-71
C REISSUED 11-26-90
D/ ECO 102 10-5-92

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TITLE:

TRI-WING® DRIVER TORSIONAL & FATIGUE TEST BLOCK

DRAWN:

L. A. P.

DATE:

10-25-68

DRAWING NUMBER

TWD-3

CHECKED:

G. LaMONICA

DATE:

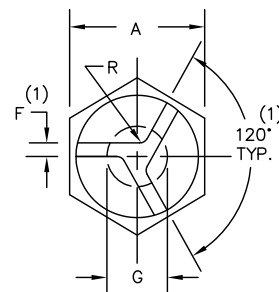
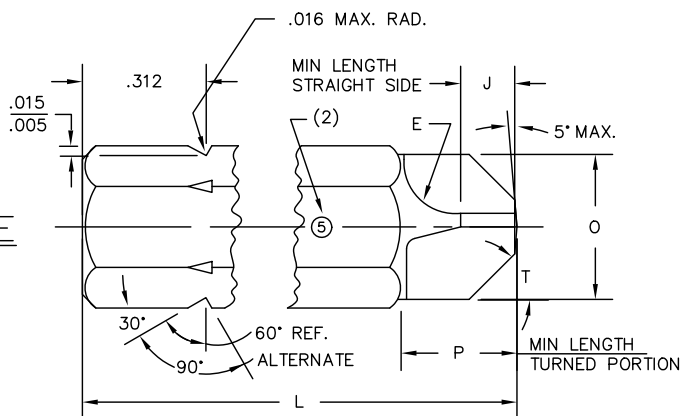
02-23-05

SHEET 1 OF 1

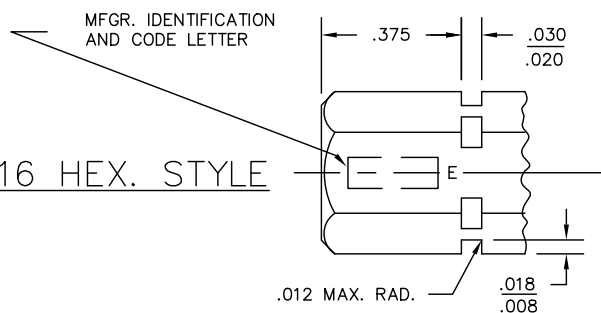
PHILLIPS SCREW CO. 155 FARM STREET, BELLINGHAM, MA 02019 U.S.A.
PHONE: 774-396-6190 FAX: 508-966-2326

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HEXSTIX® POZILOCK® ARE REGISTERED TRADEMARKS OF THE PHILLIPS SCREW COMPANY

1/4 HEX. STYLE



5/16 HEX. STYLE



NOTE: (1) DRIVING WALLS MUST BE WITHIN .0005 OF 120° CENTERLINE.

(2) DRIVER BITS TO BE MARKED WITH RECESS NUMBER ENCIRCLED IN LETTERS APPROX. 1/16" HIGH.

1/4 HEX. STYLE											
RECESS NUMBER	DRIVER SIZE	A +.000 −.004	E RAD.	F	G ±.001	J	L REF.	O DIA.	P	R RAD.	T
0	0D	.2500	.125	.0180 .0170	.038	.047	1.000	.185 .180	.188	.005 .000	46°00' 45°30'
1	1D			.0220 .0210	.053	.062			.203	.006 .001	
2	2D			.0290 .0280	.068	.078			.219	.010 .005	
3	3D			.0370 .0360	.083	.094				.020 .015	
4	4D		.188	.0420 .0410	.097			.247 .242	.250	.025 .020	46°30' 45°30'
5	5D			.0480 .0470	.144	.109					
5/16 HEX. STYLE											
4	4E			.0420 .0410	.097	.094	1.250	.309 .304	.250	.025 .020	46°30' 45°30'
5	5E			.0480 .0470	.144	.109					

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TITLE:

**TRI-WING®
INSERT BITS**

DRAWN:

L. A. P.

DATE:

11-12-68

DRAWING NUMBER

TWD-4

CHECKED:

G. LaMONICA

DATE:

02-23-05

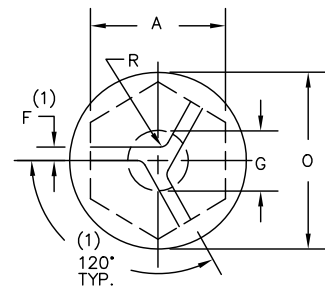
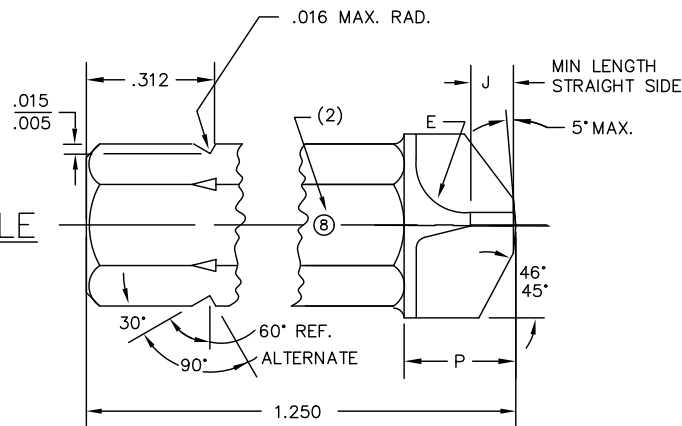
SHEET 1 OF 2

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PHONE: 774-396-6190 FAX: 508-966-2326

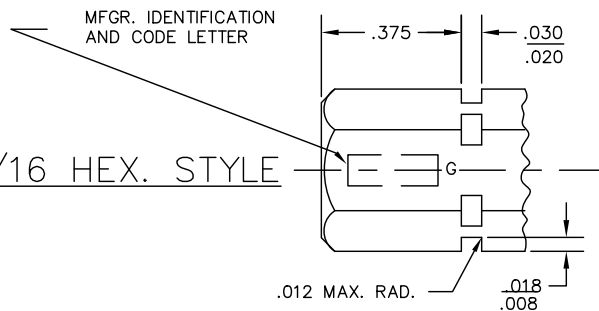
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REVISION
A TWCN 27 11-25-68
B TWCN 28 1-6-69
C TWCN 38 6-23-70
D REISSUED 11-28-90

1/4 HEX. STYLE



5/16 HEX. STYLE



NOTE: (1) DRIVING WALLS MUST BE WITHIN .0005 OF 120° CENTERLINE.

(2) DRIVER BITS TO BE MARKED WITH RECESS NUMBER ENCIRCLED IN LETTERS APPROX. 1/16" HIGH.

RECESS NUMBER	DRIVER SIZE	A +.000 -.004	E RAD.	F ±.001	G ±.001	J	O DIA.	P	R RAD.
6	6F	.250	.188	.0600	.184	.125	.437	.375	.025
	6G	.312		.0585					
7	7F	.250		.0730	.188	.141	.429	.438	.020
	7G	.312		.0715					
8	8F	.250		.0850	.175	.172	.504	.496	.030
	8G	.312		.0835					

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TITLE:

**TRI-WING®
INSERT BITS**

DRAWN:

L. A. P.

DATE:

11-12-68

DRAWING NUMBER

TWD-4

CHECKED:

G. LoMONICA

DATE:

02-23-05

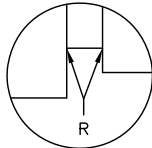
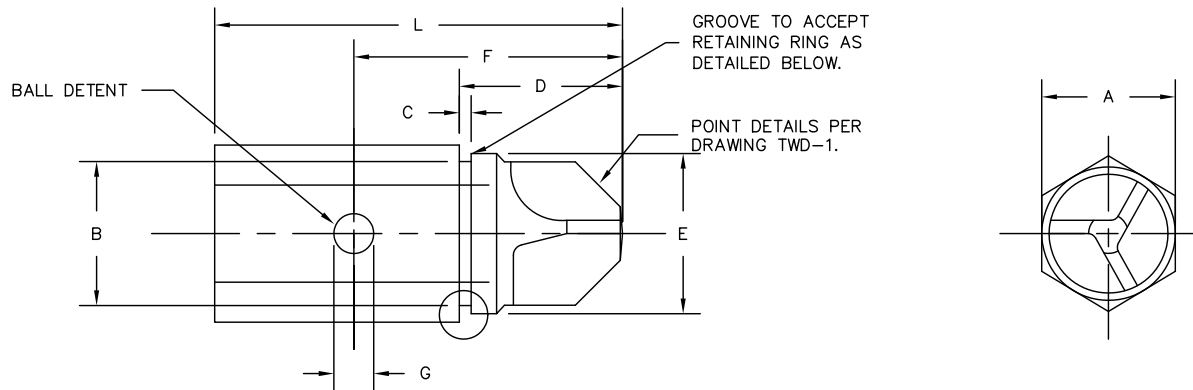
SHEET 2 OF 2

PHILLIPS SCREW CO. 155 FARM STREET, BELLINGHAM, MA 02019 U.S.A.

PHONE: 774-396-6190 FAX: 508-966-2326

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HEXSTIX® POZILOCK® ARE REGISTERED TRADEMARKS OF THE PHILLIPS SCREW COMPANY

REVISION
A REISSUED
11-26-90



ENLARGED DETAIL OF GROOVE

NOTE: THE TOP CLEARANCE VALUES AS TABULATED REPRESENT THE MINIMUM HEIGHTS OVER THE SCREW HEAD TO INSERT THE BIT IN THE RECESS.
FOR DESIGN PURPOSES, THE TOTAL CLEARANCE NECESSARY TO INSTALL AND REMOVE SCREWS, SHOULD INCLUDE THE TOTAL OVERALL LENGTH OF THE SCREW, MEASURED FROM THE HIGHEST PORTION OF THE HEAD, PLUS THE MINIMUM TOP CLEARANCE VALUES TABULATED BELOW.

THESE DRIVER BITS TO BE USED WITH BELOW LISTED THROUGH SOCKET, SINGLE OR DOUBLE HEXAGON, RATCHET WRENCHES OR EQUIVALENT PRODUCTS.

DRIVER SIZE	GROOVE DIMENSIONS					RETAINING RING	E	F ±.031	G BALL DIA.	L ±.031	CLEARANCE		WRENCH NO.
	A +.000 -.004	B	C +.003 -.000	D ±.031	R MAX.						MIN. TOP	MIN. SIDE	
0	.250	.2315 .2285	.028	.343	.003	WALDES #5125 OR EQUAL	.247 .242	.500	.125	.687	.718	.312	"SNAP-ON" R-810 OR EQUAL
1													
2													
3													
4				.375				.531					
5	.437	.4140 .4100		.562	.005	WALDES #5143 OR EQUAL	.434 .429	.718	.187	.875	.906	.468	"SNAP-ON" R-1214 OR EQUAL
6													
7													
8	.625	.5990 .5930	.039	.656		WALDES #5162 OR EQUAL	.622 .617	.843		1.031	1.062	.656	"SNAP-ON" R-2022 OR EQUAL
9													
10													
11													

A REISSUED
11-26-90

REVISION

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TITLE:

TRI-WING® BIT FOR MINIMUM CLEARANCE APPLICATION

DRAWN:

A. P. C.

DATE:

10-08-69

DRAWING NUMBER

TWD-5

CHECKED:

G. LoMONICA

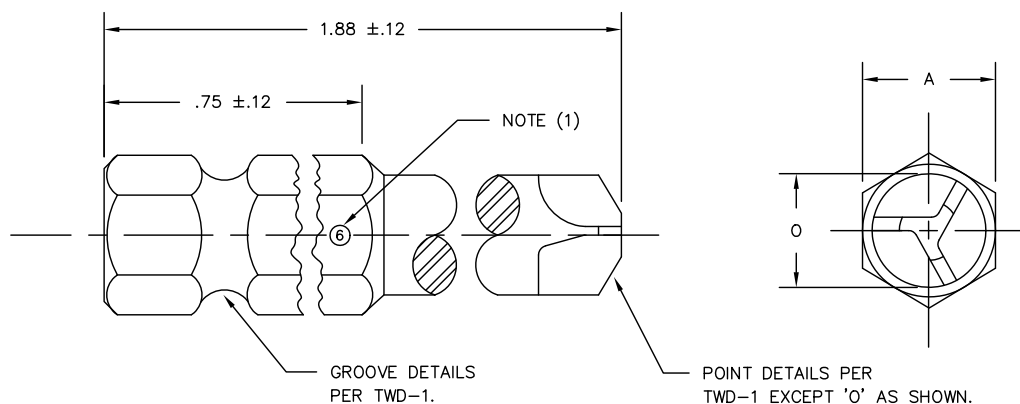
DATE:

02-23-05

SHEET 1 OF 1

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PHONE: 774-396-6190 FAX: 508-966-2326

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HEXSTIX® POZILOCK® ARE REGISTERED TRADEMARKS OF THE PHILLIPS SCREW COMPANY



RECESS NUMBER	DRIVER SIZE	A +.000 -.004	O +.000 -.004
0	0	.250	.125
1	1		
2	2		
3	3		.188
4	4		
5	5	.438	
6	6		
7	7		
8	8		
9	9	.625	
10	10		
11	11		

NOTE: (1) DRIVERS TO BE MARKED WITH RECESS NO. ENCIRCLED IN LETTERS APPROX. 1/16" IN HEIGHT.

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TITLE:

TRI-WING® LONG SHANK INSERT BITS

DRAWN:
K. N.

DATE:
03-23-70

DRAWING NUMBER

TWD-6

CHECKED:
G. LaMONICA

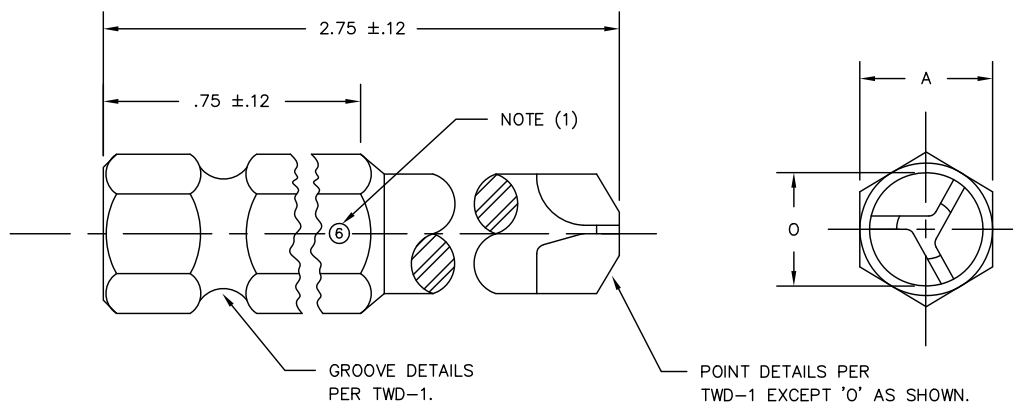
DATE:
02-23-05

SHEET 1 OF 1

PHILLIPS SCREW CO. 155 FARM STREET, BELLINGHAM, MA 02019 U.S.A.
PHONE: 774-396-6190 FAX: 508-966-2326

PHILLIPS II® PHILLIPS® POZIDRIV® ACR® POZISQUARE® PHILLIPS SQUARE-DRIV® TORQ-SET® TRI-WING® MORTORQ®
HEXSTIX® POZILOCK® ARE REGISTERED TRADEMARKS OF THE PHILLIPS SCREW COMPANY

REVISION
A TWCN 51 10-24-74
B REISSUED 11-26-90



RECESS NUMBER	DRIVER SIZE	A +.000 -.004	O +.000 -.004
0	0	.250	.125
1	1		
2	2		
3	3		.188
4	4	.438	
5	5		
6	6		
7	7		
8	8	.625	
9	9		
10	10		
11	11		

NOTE: (1) DRIVERS TO BE MARKED WITH RECESS NO. ENCIRCLED IN LETTERS APPROX. 1/16" IN HEIGHT.

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TITLE:

TRI-WING® LONG SHANK INSERT BITS

DRAWN:

K. N.

DATE:

03-23-70

DRAWING NUMBER

TWD-7

CHECKED:

G. LaMONICA

DATE:

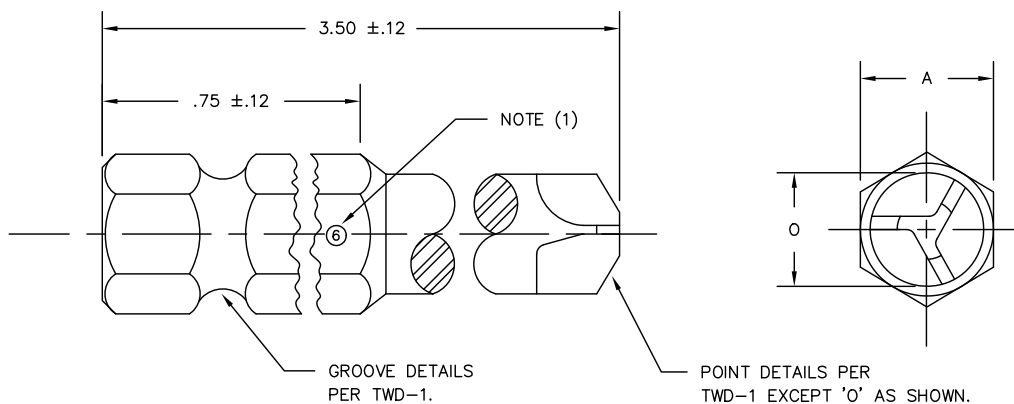
02-23-05

SHEET 1 OF 1

PHILLIPS SCREW CO. 155 FARM STREET, BELLINGHAM, MA 02019 U.S.A.
PHONE: 774-396-6190 FAX: 508-966-2326

PHILLIPS II® PHILLIPS® POZIDRIV® ACR® POZISQUARE® PHILLIPS SQUARE-DRIV® TORQ-SET® TRI-WING® MORTORQ®
HEXSTIX® POZILOCK® ARE REGISTERED TRADEMARKS OF THE PHILLIPS SCREW COMPANY

REVISION
A TWCN 51 10-24-74
B REISSUED 11-26-90



RECESS NUMBER	DRIVER SIZE	A +.000 -.004	O +.000 -.004
0	0	.250	.125
1	1		
2	2		
3	3		.188
4	4	.438	
5	5		
6	6		
7	7		
8	8	.625	
9	9		
10	10		
11	11		

NOTE: (1) DRIVERS TO BE MARKED WITH RECESS NO. ENCIRCLED IN LETTERS APPROX. 1/16" IN HEIGHT.

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TITLE:

TRI-WING® LONG SHANK INSERT BITS

DRAWN:
K. N.

DATE:
03-23-70

DRAWING NUMBER

CHECKED:
G. LaMONICA

DATE:
02-23-05

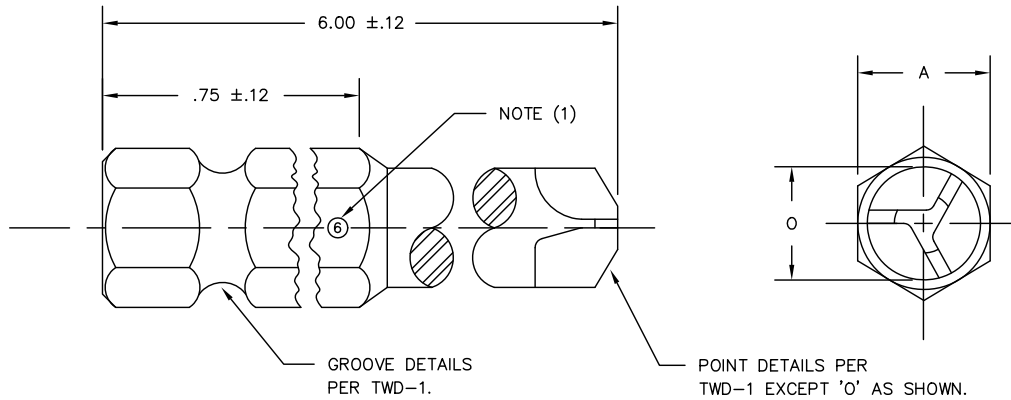
TWD-8

SHEET 1 OF 1

PHILLIPS SCREW CO. 155 FARM STREET, BELLINGHAM, MA 02019 U.S.A.
PHONE: 774-396-6190 FAX: 508-966-2326

PHILLIPS II® PHILLIPS® POZIDRIV® ACR® POZISQUARE® PHILLIPS SQUARE-DRIV® TORQ-SET® TRI-WING® MORTORQ®
HEXSTIX® POZILOCK® ARE REGISTERED TRADEMARKS OF THE PHILLIPS SCREW COMPANY

REVISION A TWCN 51 B REISSUED 10-24-74 11-26-90



RECESS NUMBER	DRIVER SIZE	A +.000 -.004	O +.000 -.004
0	0	.250	.125
1	1		
2	2		
3	3		.188
4	4	.438	
5	5		
6	6		
7	7		
8	8	.625	
9	9		
10	10		
11	11		

NOTE: (1) DRIVERS TO BE MARKED WITH RECESS NO. ENCIRCLED IN LETTERS APPROX. 1/16" IN HEIGHT.

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TITLE:

TRI-WING® LONG SHANK INSERT BITS

DRAWN:
K. N.

DATE:
03-23-70

DRAWING NUMBER

CHECKED:
G. LaMONICA

DATE:
02-23-05

TWD-9

SHEET 1 OF 1

PHILLIPS SCREW CO. 155 FARM STREET, BELLINGHAM, MA 02019 U.S.A.
PHONE: 774-396-6190 FAX: 508-966-2326

PHILLIPS II® PHILLIPS® POZIDRIV® ACR® POZISQUARE® PHILLIPS SQUARE-DRIV® TORQ-SET® TRI-WING® MORTORQ®
HEXSTIX® POZILOCK® ARE REGISTERED TRADEMARKS OF THE PHILLIPS SCREW COMPANY

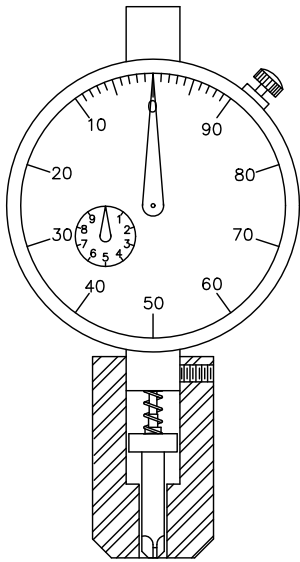
REVISION
A TWCN 51 10-24-74
B REISSUED 11-26-90

4/16/75
11/26/90
02/23/05

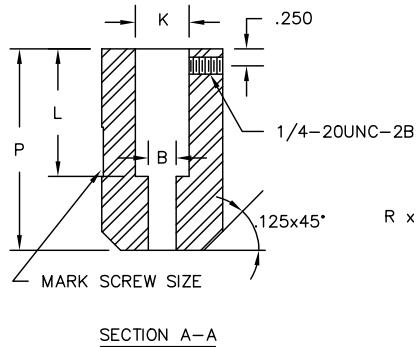
TRI-WING[®] ENGINEERING MANUAL GAGES

<u>SHEET NUMBER</u>	<u>DESCRIPTION</u>	<u>DATE</u>
TWG-1	Recess Penetration Gage	11/26/90
TWSG-1	Special Penetration Gage	11/26/90
TWG-2	Hand Plug Gage	11/26/90
TWG-3	Bit Wafer Gage	11/26/90
TWG-5	Inspection Gage (Punch)	11/26/90
TWG-6	Ground Slot Bit Gage	11/26/90
TWG-7	Fallaway Gage	Sheet 1 11/26/90
TWG-7	Indicator Assembly	Sheet 2 11/26/90

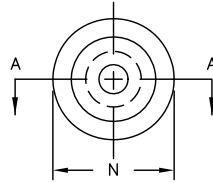
GAGE ASSEMBLY



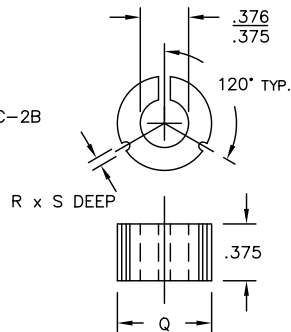
GAGE BODY



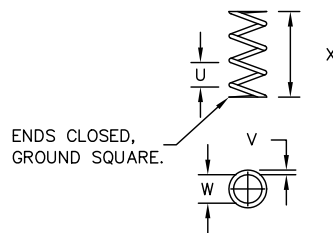
SECTION A-A



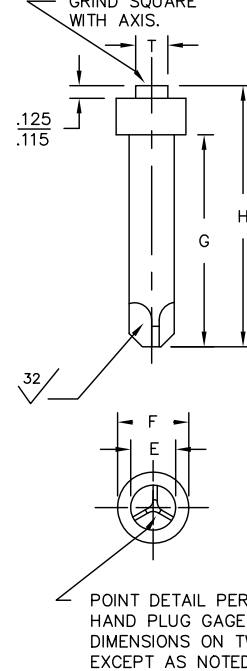
GAGE BUSHING



GAGE SPRING



GAGE POINT



RECESS NUMBER	SCREW SIZE	B +.002 -.000	E ±.0002	F ±.005	G ±.005	H ±.005	K	L +.016 -.000	N ±.010	P ±.016	Q	R ±.016	S +.000 -.015	T +.000 -.005	U	V	W	X
0	0	.073	.072	.120	.750	1.125	.376 .375	1.375	.875	2	—	—	—	.195	.103	.023	.200	.562
1	2	.104	.103	.183														
2	4	.133	.132															
3	6	.160	.159	.245														
4	8	.190	.189															
5	10	.233	.232	.369														
6	1/4	.304	.303															
7	5/16	.359	.358	.495														
8	3/8	.407	.406															
9	7/16	.470	.469	.744														
10	1/2	.536	.535															
11	9/16	.638	.637															
12	5/8	.708	.707	.995	1.625	2.125	1.376 1.375	1.875	2.000	3	1.3745 1.3740	.125	.265	.375	.166	.035	.380	1.188
13	3/4	.880	.879															
14	7/8	1.120	1.119															
15	1"	1.260	1.259	1.369														

REVISION

A. TWCN 17 7-16-68

B. TWCN 21 9-11-68

C. TWCN 45 10-17-74

D. REISSUED 11-26-90

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TITLE:

TRI-WING® RECESS PENETRATION GAUGE

DRAWN:
L.P.DATE:
7-10-68

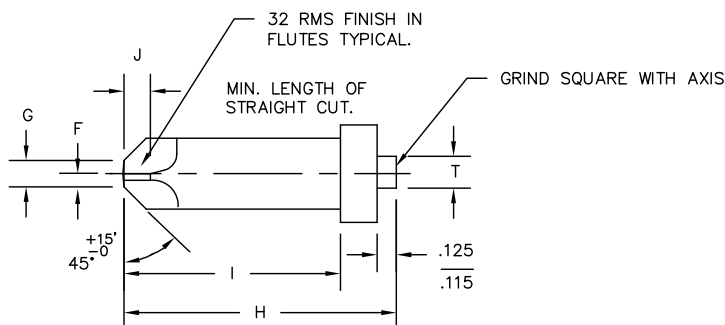
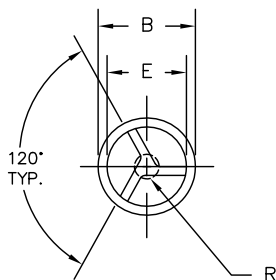
DRAWING NUMBER

TWG-1CHECKED:
G. LaMONICADATE:
2-17-05

SHEET 1 OF 1

PHILLIPS SCREW CO. 155 FARM STREET, BELLINGHAM, MA 02019 U.S.A.
PHONE: 774-396-6190 FAX: 508-966-2326

PHILLIPS II® PHILLIPS® POZIDRIV® ACR® POZISQUARE® PHILLIPS SQUARE-DRIV® TORQ-SET® TRI-WING® MORTORQ®
HEXSTIX® POZILOCK® ARE REGISTERED TRADEMARKS OF THE PHILLIPS SCREW COMPANY



RECESS NUMBER	DRIVER SIZE	B ±.005	E ±.0002	F	G	H ±.005	I ±.005	J MIN. REF.	R	T
0	0									
1	2									
2	4									
3	6	.245	.159	.0373 .0370	.069 .068	1.125	.750	.125	.020 .017	.195 .190
4	8	.245	.189	.0423 .0420	.098 .097	1.125	.750	.125	.025 .022	.195 .190
5	10	.369	.232	.0483 .0480	.145 .144					
6	1/4		.303	.0603 .0600	.185 .184			.188		
7	5/16	.495	.358	.0733 .0730	.189 .188	1.125	.750	.188	.025 .022	.375 .370
8	3/8									
9	7/16									
10	1/2									
11	9/16									
12	5/8									
13	3/4									
14	7/8									
15	1"									

NOTE: (1) DRIVING WING WALLS TO BE WITHIN .0001 OF 120° CENTERLINE.

(2) THIS GAGE IS DESIGNED WITH LARGER THAN NORMAL WING THICKNESSES, FOR USE DURING HEADING ONLY, FOR PARTS SUBSEQUENTLY REQUIRING PLATING. IT IS NOT INTENDED FOR USE AS A FINAL INSPECTION GAGE.

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TITLE:

TRI-WING® SPECIAL PENETRATION GAUGE

DRAWN:
L. A. P.

DATE:
08-18-69

DRAWING NUMBER

CHECKED:
G. LaMONICA

DATE:
02-23-05

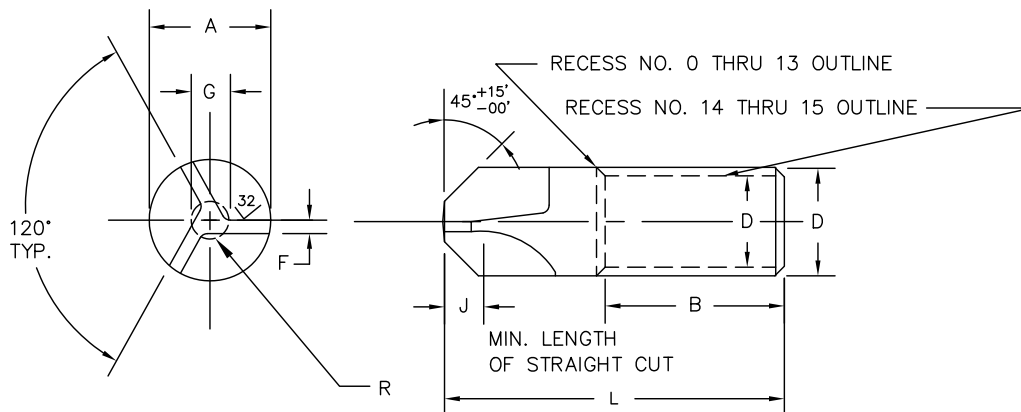
TWSG-1

SHEET 1 OF 1

PHILLIPS SCREW CO. 155 FARM STREET, BELLINGHAM, MA 02019 U.S.A.
PHONE: 774-396-6190 FAX: 508-966-2326

PHILLIPS II® PHILLIPS® POZIDRIV® ACR® POZISQUARE® PHILLIPS SQUARE-DRIV® TORQ-SET® TRI-WING® MORTORQ®
HEXSTIX® POZILOCK® ARE REGISTERED TRADEMARKS OF THE PHILLIPS SCREW COMPANY

REVISION
A TWCN 50 11-23-74
B TWCN 55 10-25-76
C REISSUED 11-26-90



RECESS NUMBER	SCREW SIZE	A	D	B	L	F		J MIN. REF.	G	R		
						GO	NOGO					
0	0	.125 .120	.125 .120			.0178 .0175	.0213 .0210	.031	.039 .038	.005 .000		
1	2	.156 .152	.156 .152		1.375	.0218 .0215	.0253 .0250	.078	.054 .053	.006 .003		
2	4					.0288 .0285	.0323 .0320		.069 .068	.010 .007		
3	6	.250 .246	.250 .246			.0368 .0365	.0403 .0400	.125	.084 .083	.020 .017		
4	8								.0418 .0415	.0453 .0450	.098 .097	.025 .022
5	10											
6	1/4	.0598 .0595	.0633 .0630		.188	.185 .184						
7	5/16					.0728 .0725	.0763 .0760	.189 .188				
8	3/8				.0848 .0845				.0883 .0880	.250	.176 .175	.030 .025
9	7/16					.0968 .0965	.1013 .1010	.201 .200				
10	1/2	.1088 .1085	.1133 .1130		.312				.226 .225	.048 .043		
11	9/16					.1218 .1215	.1273 .1270	.252 .251	.060 .055			
12	5/8									.1338 .1335	.1393 .1390	.274 .273
13	3/4	1.000 .980	1.000 .980		3	.1598 .1595	.1653 .1650	.500	.340 .339			
14	7/8	1.125 1.120		2	4	.1848 .1845	.1903 .1900		.545 .544			
15	1"	1.375 1.365				.2098 .2095	.2153 .2150		.605 .604	.080 .075		

NOTE: DIMENSIONS FOR GO & NOGO GAGES ARE IDENTICAL EXCEPT AS NOTED.

FLUTES TO HAVE 32 RMS FINISH AS INDICATED.

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TITLE:

TRI-WING® HAND PLUG GAUGE POINTS

DRAWN:
L.A.P.

DATE:
7-3-68

DRAWING NUMBER

CHECKED:
G. LaMONICA

DATE:
2-17-05

TWG-2

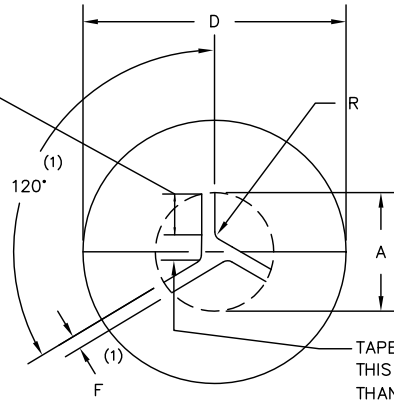
SHEET 1 OF 1

PHILLIPS SCREW CO. 155 FARM STREET, BELLINGHAM, MA 02019 U.S.A.
PHONE: 774-396-6190 FAX: 508-966-2326

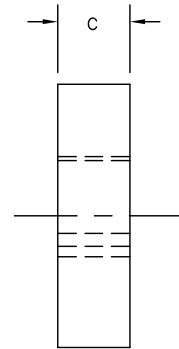
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HEXSTIX® POZILOCK® ARE REGISTERED TRADEMARKS OF THE PHILLIPS SCREW COMPANY

REVISION
A TWCN 17 7-16-68
B TWCN 21 9-11-68
C TWCN 30 4-8-69
D REISSUED 11-26-90

REMOVAL WING WALL
MUST BE PARALLEL TO
DRIVING WING WALL
WITHIN $\pm 0^\circ 11'$ WHEN
MEASURED IN THIS AREA.



TAPER OF REMOVAL WING WALL IN
THIS AREA MUST NOT BE MORE
THAN .0003 BEYOND "F" LIMITS.



GO GAGE

RECESS NUMBER	DRIVER SIZE	$\pm .005$ A	$\pm .005$ C	$\pm .005$ D	$+.0002$ $-.0000$ F	RAD. R
0	0	.112	.125	1.000	.0180	.006 .005
1	1	.145			.0220	.006 .005
2	2	.178			.0290	.012 .010
3	3	.212			.0370	.022 .020
4	4	.245			.0420	.022 .020
5	5	.278			.0480	.027 .025
6	6	.385			.0600	
7	7	.455			.0730	
8	8	.487	.250	2.000	.0850	.032 .030
9	9	.558			.0970	.050 .048
10	10	.628			.1090	
11	11	.698			.1220	
12	12	.768			.1340	.068 .060
13	13	.940			.1600	.088 .078
14	14	1.180			.1850	
15	15	1.320			.2100	.088 .080

NOTE: (1) DRIVING WING WALLS TO BE WITHIN .0001 OF 120° CENTERLINE.

REVISION
A/ TWCN 11
5-27-68
B/ TWCN 13
7-2-68
C/ ECO #58
12-5-86
D/ REVISED
11-26-90

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TITLE:

TRI-WING® BIT WAFER GAUGE

DRAWN:

K. N.

DATE:

06-22-68

DRAWING NUMBER

TWG-3

CHECKED:

G. LaMONICA

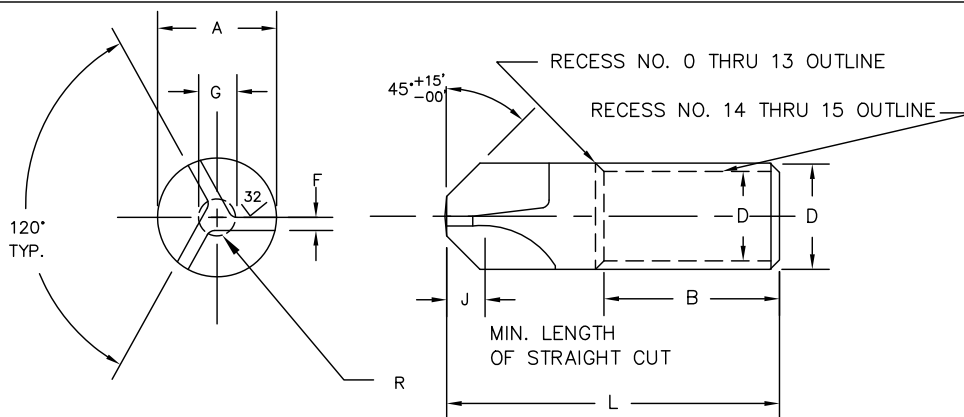
DATE:

02-23-05

SHEET 1 OF 1

PHILLIPS SCREW CO. 155 FARM STREET, BELLINGHAM, MA 02019 U.S.A.
PHONE: 774-396-6190 FAX: 508-966-2326

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GO GAGE

RECESS NUMBER	SCREW SIZE	A	D	B	L	F +.0000 -.0003	J MIN. REF.	G	R			
0	0	.125 .120	.125 .120	—	1.37	.0195	.031	.039 .038	.005 .000			
1	2	.156 .152	.156 .152			.0235	.047	.054 .053	.006 .003			
2	4									.0305	.069 .068	.010 .007
3	6	.0385	.125			.084 .083	.020 .017					
4	8							.0435	.098 .097	.145 .144	.025 .022	
5	10											.0495
6	1/4	.500 .496	.500 .496		.0615	.188	.176 .175	.030 .025				
7	5/16								.0745	.201 .200	.226 .225	.048 .043
8	3/8											
9	7/16	.1105	.312		.274 .273	.060 .055						
10	1/2						.1265	.312	.274 .273	.060 .055		
11	9/16										.1385	.312
12	5/8	.1385	.312		.274 .273	.060 .055						
13	3/4						1.000 .980	1.000 .980	3.00	.1645	.500	.340 .339
14	7/8	1.125 1.120	2		4.00	.1895	.545 .544		.080 .075			
15	1"	1.375 1.365		.2145		.605 .604						

NOTE: NO GO GAGE FOR PUNCH INSPECTION IS IDENTICAL TO NO GO GAGE ON TWG-2.

FLUTES TO HAVE 32 RMS FINISH AS INDICATED.

REVISION
A REISSUED
11-26-90

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TITLE:

TRI-WING® PUNCH INSPECTION GAUGE

DRAWN:
K. N.

DATE:
03-01-69

DRAWING NUMBER

TWG-5

CHECKED:
G. LaMONICA

DATE:
02-23-05

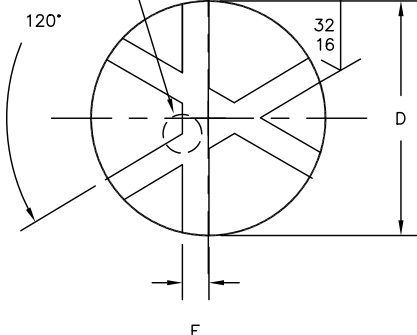
SHEET 1 OF 1

PHILLIPS SCREW CO. 155 FARM STREET, BELLINGHAM, MA 02019 U.S.A.
PHONE: 774-396-6190 FAX: 508-966-2326

PHILLIPS II® PHILLIPS® POZIDRIV® ACR® POZISQUARE® PHILLIPS SQUARE-DRIV® TORQ-SET® TRI-WING® MORTORQ®
HEXSTIX® POZILOCK® ARE REGISTERED TRADEMARKS OF THE PHILLIPS SCREW COMPANY

REFER TO RADIUS
OR CHAMFER DETAIL

ALL SLOT
SURFACES TYPICAL

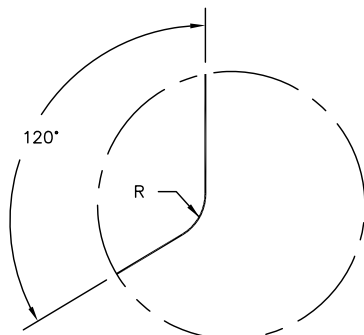


NOTE: (1) DRIVING WING WALLS TO BE WITHIN
.0001 OF 120° CENTERLINE.

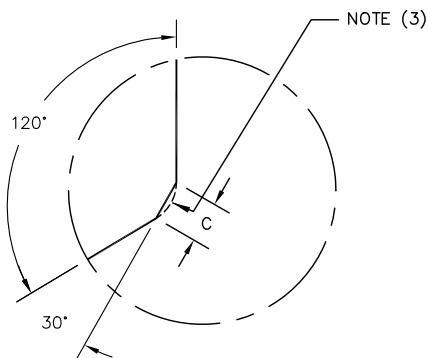
(2) TAFT-PIERCE NO. 4 TAPER.

(3) SLIGHT CONVEX SURFACE PERMISSIBLE.

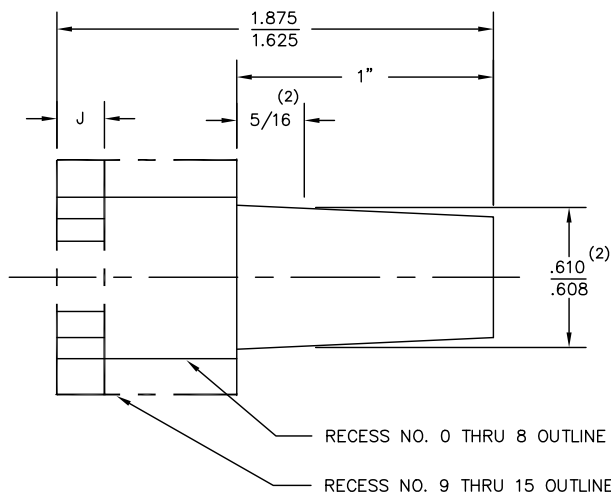
(4) MATERIAL, WATER-HARDENED DRILL ROD
OR EQUIVALENT, R/c 63 MIN. HARDNESS.



REC. NO 5 THRU 15
RADIUS DETAIL



REC. NO. 0 THRU 4
CHAMFER DETAIL



RECESS NUMBER	DRIVER SIZE	±.010 D	F		CHFR. C	RAD. R	MIN. REF. J	
			+.0002 −.0000 GO	+.0000 −.0002 NOGO				
0	0	.625	.0180	.0170	.017 .009	—	.078	
1	1		.0220	.0210	.019 .010		.093	
2	2		.0290	.0280	.026 .017		.109	
3	3		.0370	.0360	.043 .035		.125	
4	4		.0420	.0410	.052 .043			
5	5		.0480	.0470	—	.140		
6	6		.0600	.0585		.030 .025		.156
7	7		.0730	.0715		.171		
8	8	.0850	.0835	.035 .030		.203		
9	9	1.000	.0970		.0955	—	.234	
10	10		.1090		.1075		.052 .048	.250
11	11		.1220		.1200		.065 .060	.281
12	12		.1340	.1320	.343			
13	13	1.375	.1600	.1580	.083 .078	.406		
14	14		.1850	.1830		.085 .080		.468
15	15		.2100	.2080				

REVISION
A/ TWON 34
8-18-69
B/ REVISED
11-26-90

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TITLE:

TRI-WING® GROUND-SLOT BIT GAUGE

DRAWN:
L. A. P.

DATE:
06-13-69

DRAWING NUMBER

CHECKED:
G. LaMONICA

DATE:
02-24-05

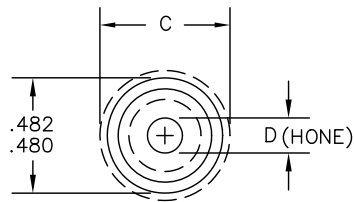
TWG-6

SHEET 1 OF 1

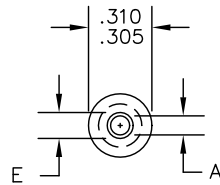
PHILLIPS SCREW CO. 155 FARM STREET, BELLINGHAM, MA 02019 U.S.A.
PHONE: 774-396-6190 FAX: 508-966-2326

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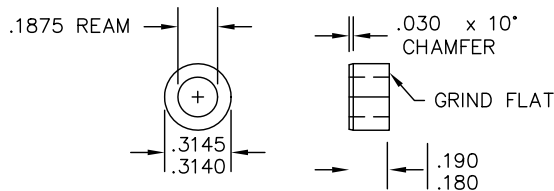
BODY
TOOL STEEL
Rc 62 - 64



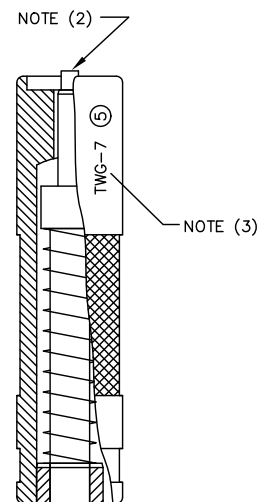
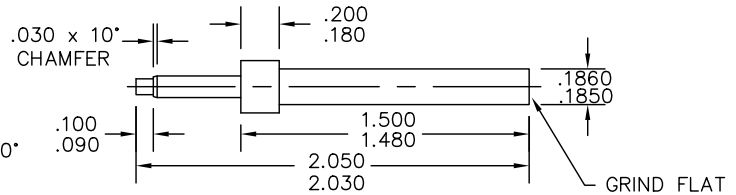
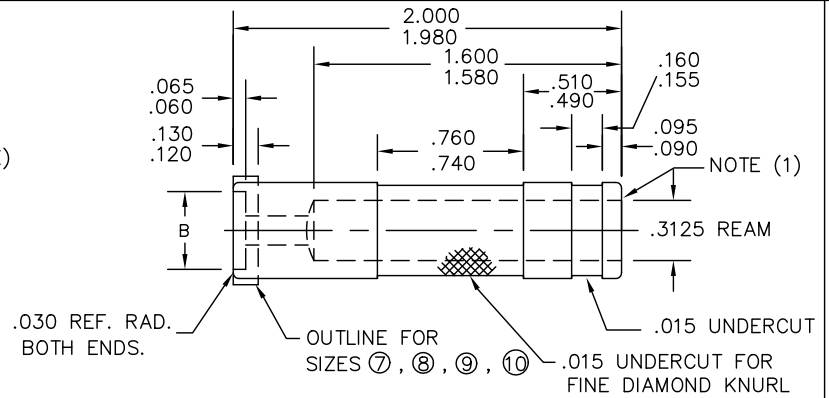
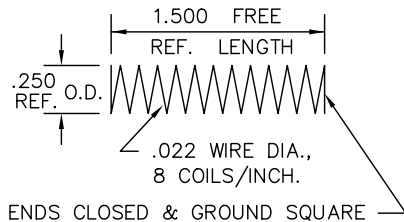
PIN
TOOL STEEL
Rc 62 - 64



BUSHING
TOOL STEEL
Rc 62 - 64



SPRING
MUSIC WIRE



ASSEMBLY

SIZE (REC. NO.)	A +.0005 -.0000	B ±.001	C ±.015	D ±.0005	E +.0000 -.0005
②	.0692	.148	—	.141	.140
③	.0872	.182			
④	.0992	.215			
⑤	.1098	.248			
⑥	.1376	.325	.562	.266	.265
⑦	.1706	.395			
⑧	.1994	.427			
⑨	.2302	.498			
⑩	.2588	.568	.750		

NOTES:

- (1) GRIND FLAT, BOTH ENDS. EDGE AT 'B' DIA. TO BE SHARP.
- (2) WITH BACK END OF PIN HELD FLUSH WITH BACK END OF BODY AND BUSHING, GRIND PIN END FOR A PROTUSION OF .015 BEYOND FRONT END OF BODY. EDGE OF PIN AT 'A' DIA. TO BE SHARP.
- (3) MARK GAGE BODY 'TWG-7' FOLLOWED BY RECESS NUMBER ENCIRCLED.
- (4) ALL DIAMETERS TO BE CONCENTRIC WITHIN .001 T.I.R.
- A (5) TENTATIVE ONLY, NOT VERIFIED IN MANUFACTURING.

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TITLE:

**TRI-WING®
FALLAWAY GAUGE**

DRAWN:

J. K. N.

DATE:

05-04-71

DRAWING NUMBER

TWG-7

CHECKED:

G. LaMONICA

DATE:

02-23-05

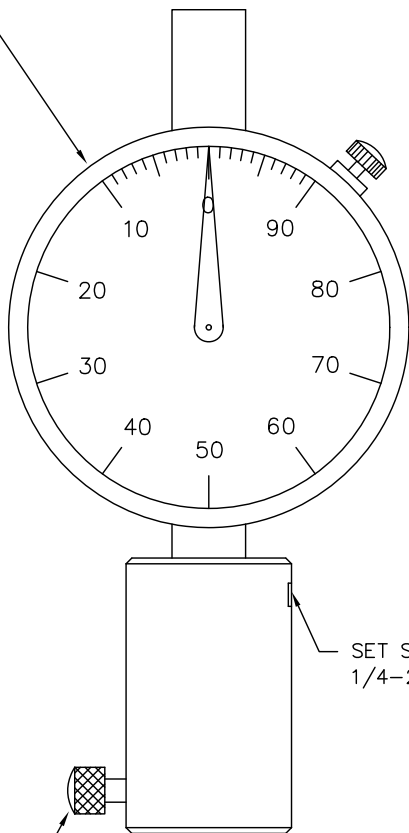
SHEET 1 OF 2

PHILLIPS SCREW CO. 155 FARM STREET, BELLINGHAM, MA 02019 U.S.A.
PHONE: 774-396-6190 FAX: 508-966-2326

PHILLIPS II® PHILLIPS® POZIDRIV® ACR® POZISQUARE® PHILLIPS SQUARE-DRIV® TORQ-SET® TRI-WING® MORTORQ®
HEXSTIX® POZILOCK® ARE REGISTERED TRADEMARKS OF THE PHILLIPS SCREW COMPANY

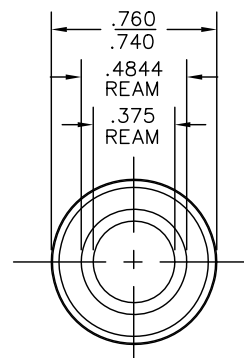
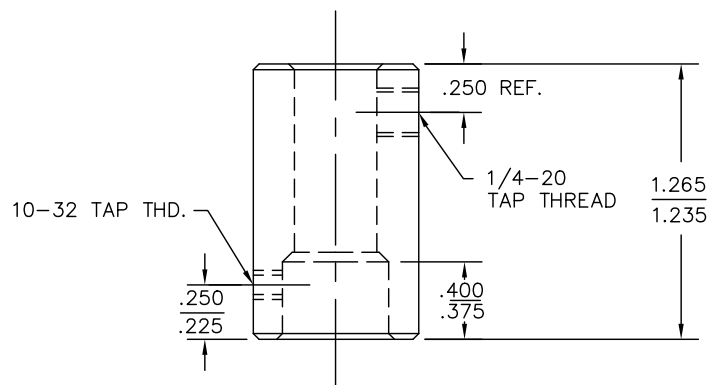
REVISION
A REISSUED
11-26-90

STANDARD DIAL INDICATOR WITH NUMERALS
READING COUNTER-CLOCKWISE IN THOUSANDTHS.



SET SCREW
1/4-20 X 3/16 LONG

THUMB SCREW
10-32 X 3/16 THD. LONG



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11-26-90

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TITLE:

INDICATOR ASSEMBLY FOR TRI-WING® FALLAWAY GAUGE

DRAWN:

J. K. N.

DATE:

05-10-71

DRAWING NUMBER

TWG-7

CHECKED:

G. LaMONICA

DATE:

02-23-05

SHEET 2 OF 2

PHILLIPS SCREW CO. 155 FARM STREET, BELLINGHAM, MA 02019 U.S.A.
PHONE: 774-396-6190 FAX: 508-966-2326

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HEXSTIX® POZILOCK® ARE REGISTERED TRADEMARKS OF THE PHILLIPS SCREW COMPANY

04-18-75
11-26-90
06-25-96
07-10-03
02-24-05
12-01-08

TRI-WING[®] ENGINEERING MANUAL

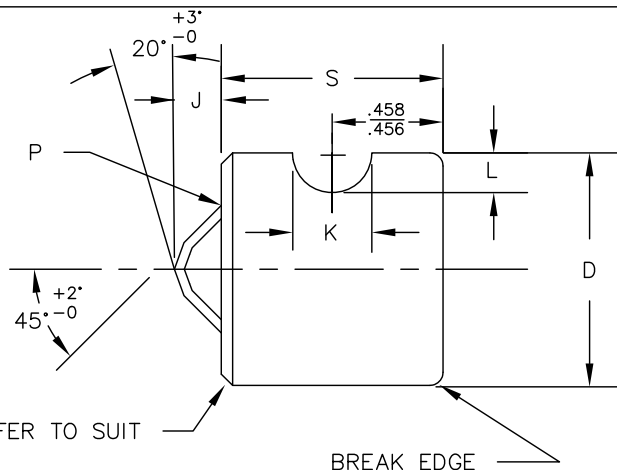
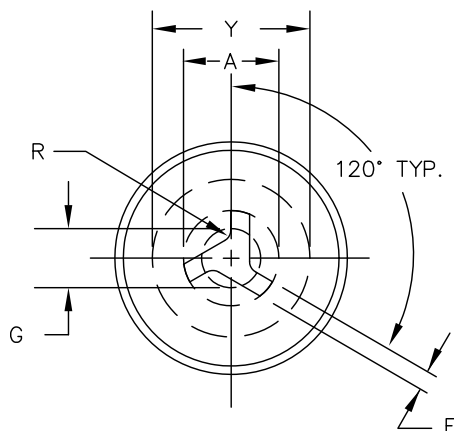
PUNCH STANDARDS & SPRING PUNCH IMPRESSIONS

PUNCH STANDARDS

<u>SHEET NUMBER</u>	<u>DESCRIPTION</u>	<u>DATE</u>
TWP-11	100° Flat Head Punch	11-26-90
TWP-11A	Deep Recess 100° Flat Head Punch	11-26-90
TWP-12	Pan Head Punch	03-03-97
TWP-13	100° Flat Head Shear Bolt Punch	11-26-90
TWP-14	Modified Pan Head Punch	11-26-90
TWP-14A	Deep Recess Modified Pan Head Punch	11-26-90
TWP-16	Washer Face Trimmed Hexagon Head Punch	11-26-90
TWP-16A	Deep Recess Washer Face Trimmed Hexagon Head Punch	11-26-90
TWP-17	100° Oval Head Punch	12-01-08
TWP-17A	Deep Recess 100° Oval Head Punch	12-01-08
TWP-18	Washer Face Indented Hexagon Head Punch	11-26-90
PIC-541	Hot Forging Punches For 100° Flat Head	11-26-90
PIC-549	Washer Head Double Radius Punch	11-26-90

SPRING PUNCH IMPRESSIONS

TWSP-1	100° Flush Head	11-26-90
TWSP-4	Modified Pan Head	11-26-90



RECESS NO.	SCREW SIZE	PUNCH NO.	±.002 A	±.0005 D	F	+.000 −.002 G	REF. J	+.001 −.000 K	+.001 −.000 L	RAD. P	R	+.000 −.004 S	MIN. FACE DIA. Y	PUNCH PEN.		
0	0	TW00−1−1	.077	.4375	.0205 .0195	.036	.027	.125	.061	.005 .003	.008 .003	1.000	.125	.0220 .0180		
1	2	TW02−1−1	.110		.0245 .0235	.051	.039						.188	.0310 .0270		
2	4	TW04−1−1	.143		.0315 .0305	.066	.051						.234	.0400 .0360		
3	6	TW06−1−1	.177		.0395 .0385	.081	.063				.312		.0495 .0445			
4	8	TW08−1−1	.210	.5625	.0445 .0435	.095	.075	.212	.105	.008 .005	.022 .019		.375	.0590 .0540		
5	10	TW10−1−1	.243		.0505 .0495	.142	.076						.438	.0520 .0470		
6	1/4	TW25−1−1	.320	.8750	.0625 .0615	.182	.102			.010 .005	.027 .024		.594	.0705 .0655		
7	5/16	TW31−1−1	.390	1.0000	.0755 .0745	.185	.136						.688	.1035 .0985		
8	3/8	TW37−1−1	.422		.0875 .0865	.172	.156			.844	.1260 .1210					
9	7/16	TW43−1−1	.493	1.2500	.1005 .0985	.197	.184			.012 .005	.034 .029		.938	.1490 .1440		
10	1/2	TW50−1−1	.563		.1125 .1105	.222	.211						1.062	.1715 .1665		
11	9/16	TW56−1−1	.633	1.5000	.1295 .1265	.248	.238			.014 .005	.064 .059		1.219	.1935 .1885		
12	5/8	TW62−1−1	.703		.1415 .1385	.270	.266					1.344	.2175 .2125			
13	3/4	TW75−1−1	.875	2.0000	.1675 .1645	.336	.331			—	—	.018 .008	.084 .079	1.500	1.531	.2705 .2655
14	7/8	TW87−1−1	1.115		.1925 .1895	.541	.385								1.812	.2880 .2830
15	1"	TW100−1−1	1.255	2.5000	.2175 .2145	.601	.436					.020 .010			2.062	.3280 .3230

NOTE: (1) WING THICKNESS "F", INCREASED .003 TO FACILITATE HOT-FORMING ON RECESS SIZES 11,12,13,14 & 15. (9-24-68)

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TITLE:

TRI-WING 100° FLAT HEAD PUNCH

DRAWN:
APC

DATE:
07-18-68

DRAWING NUMBER

TWP-11

CHECKED:
G. LAMONICA

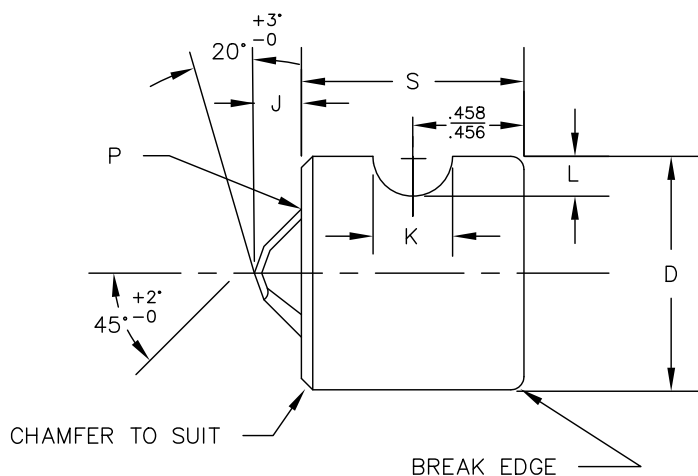
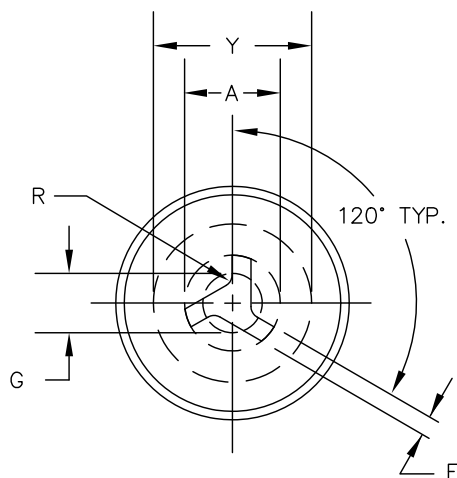
DATE:
11-08-04

SHEET 1 OF 1

PHILLIPS SCREW CO. 155 FARM STREET, BELLINGHAM, MA 02019 U.S.A.
PHONE: 774-396-6190 FAX: 508-966-2326

PHILLIPS II[®] PHILLIPS[®] POZIDRIV[®] ACR[®] POZISQUARE[®] PHILLIPS SQUARE-DRIV[®] TORQ-SET[®] TRI-WING[®] MORTORQ[®]
HEXSTIX[®] POZILOCK[®] ARE REGISTERED TRADEMARKS OF THE PHILLIPS SCREW COMPANY

REVISION
A TWCN 20 8-27-68
B TWCN 22 9-24-68
C TWCN 23 10-3-68
D TWCN 29 1-27-69
E REISSUED 11-26-90



RECESS NO.	SCREW SIZE	PUNCH NO.	±.002 A	±.0005 D	F	+.000 -.002 G	REF. J	+.001 -.000 K	+.001 -.000 L	RAD. P	RAD. R	+.000 -.004 S	MIN. FACE DIA. Y	PUNCH PEN.
4	10	TW08-1-135	.243	.5625	.0445 .0435	.095	.091	.212	.105	.008 .005	.022 .019	1.000	.438	.0755 .0705
6	5/16	TW25-1-166	.390	1.0000	.0625 .0615	.182	.137	.212	.105	.008 .005	.027 .024	1.000	.688	.1055 .1005

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TITLE:

TRI-WING® DEEP RECESS 100° FLAT HEAD PUNCH

DRAWN:

C. M. B.

DATE:

04-18-75

DRAWING NUMBER

TWP-11A

CHECKED:

G. LaMONICA

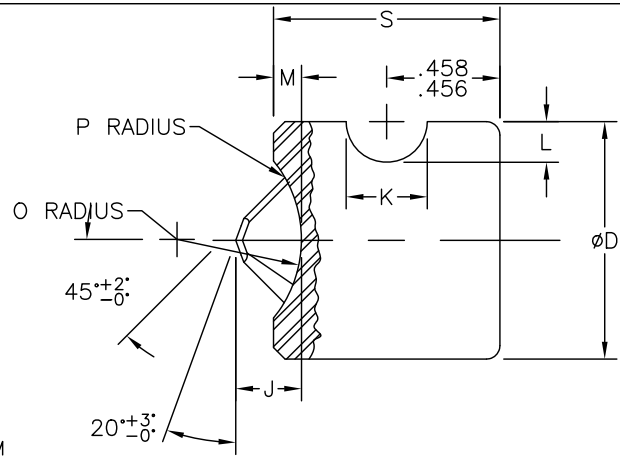
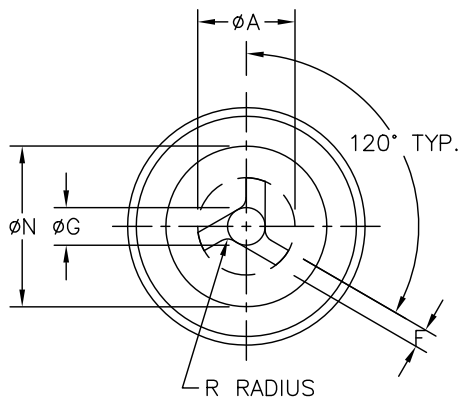
DATE:

11-08-04

SHEET 1 OF 1

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PHONE: 774-396-6190 FAX: 508-966-2326

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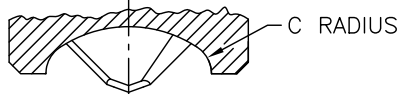


NOTE: (1) NIB TO BE CONCENTRIC WITH AXIS WITHIN .005 FIM

RECESS NO.	SCREW SIZE	PUNCH NO.	±.002	±.0005		+.000 −.002	REF.	+.001 −.000	+.001 −.000	+.002 −.000	+.005 −.000	+.005 −.000			+.000 −.004	PUNCH PEN.	
			øA	øD	F	øG	J	K	L	M	øN	O	P	R	S	MAX.	MIN.
3	6	TW06−4−1	.155	.4375	.0395 .0385	.081	.067	.125	.061	.048	.265	.207	.005 .003	.022 .019	1.000	.0385	.0335
4	8	TW08−4−1	.185	.5625	.0445 .0435	.095	.080	.212	.105	.059	.317	.244	.008 .005			.0465	.0415
5	10	TW10−4−1	.228		.0505 .0495	.142	.093			.066	.363	.284		.0445		.0395	
6	1/4	TW25−4−1	.299	.8750	.0625 .0615	.182	.123			.089	.482	.373	.010 .005	.027 .024		.0600	.0550
7	5/16	TW31−4−1	.354	1.0000	.0755 .0745	.185	.150			.095	.605	.527		.0855		.0805	
8	3/8	TW37−4−1	.402	1.2500	.0875 .0865	.172	.176			.112	.730	.652	.012 .005	.034 .029		.1160	.1110
9	7/16	TW43−4−1	.465	1.5000	.1005 .0985	.197	.206			.126	.853	.782		.1350		.1300	
10	1/2	TW50−4−1	.531		.1125 .1105	.222	.229			.124	.982	1.034		.1555		.1505	

TRUSS HEAD PUNCHES:

2	4 (M3)	SPECIAL TW04—6—1	.128	.4375	.0315 .0305	.066	.054	.125	.061	.051	.257	.187	.005	.012 .009	1.000	.0325	.0285
3	6	SPECIAL TW06—6—1	.155		.0395 .0385	.081	.065			.065	.321	.231	.003	.022 .019		.0385	.0335
4	8 (M4)	SPECIAL TW08—6—1	.185	.5625	.0445 .0435	.095	.078	.212	.105	.078	.385	.275	.008 .005			.027 .024	.0465
5	10 (M5)	SPECIAL TW10—6—1	.228		.0505 .0495	.142	.090			.094	.448	.314		.0445			.0395
6	1/4 (M6)	SPECIAL TW25—6—1	.299	.8750	.0625 .0615	.182	.121			.125	.573	.391		.010 .005			.0600
7	5/16 (M8)	SPECIAL TW31—6—1	.354	1.0000	.0755 .0745	.185	.153			.156	.698	.468	.0855			.0805	



RECESS NO.	SCREW SIZE	DOUBLE RADIUS PUNCH NO.	±.002	±.005	±.0005		+.000 -.002	REF.	+.001 -.000	+.001 -.000	+.002 -.000	+.005 -.000	+.005 -.000			+.000 -.004	PUNCH PEN.	
			ØA	C	ØD	F	ØG	J	K	L	M	ØN	O	P	R	S	MAX.	MIN.
3	6	SPECIAL TW06-8-1	.155	.041	.4375	.0395 .0385	.081	.067	.125	.061	.065	.251	.207	.005 .003	.022 .019	1.000	.0385	.0335

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TITLE:

TRI-WING® PAN & TRUSS HEAD PUNCHES

DRAWN:

K. N.

DATE:

04-12-68

DRAWING NUMBER

TWP-12

CHECKED:

G. LaMONICA

DATE:

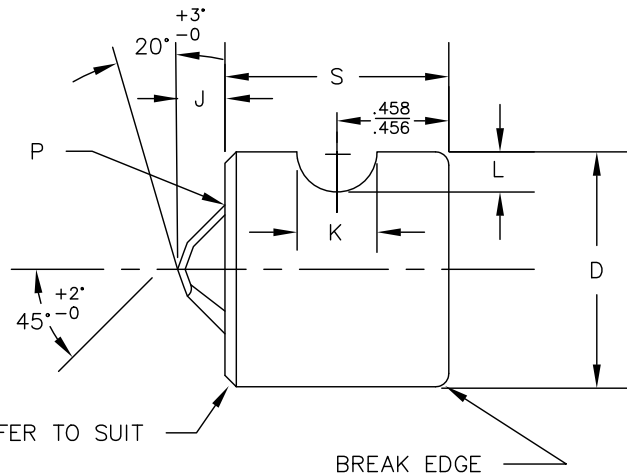
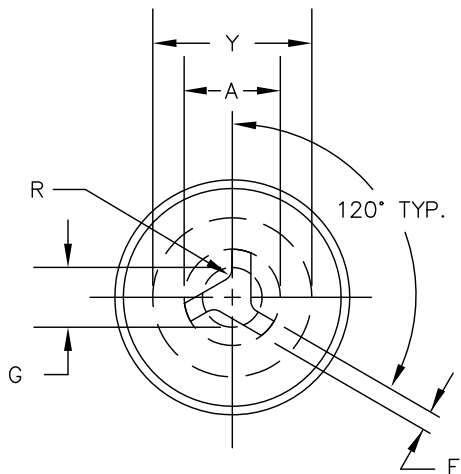
02-24-05

SHEET 1 OF 1

PHILLIPS SCREW CO. 155 FARM STREET, BELLINGHAM, MA 02019 U.S.A.
PHONE: 774-396-6190 FAX: 508-966-2326

PHILLIPS II® PHILLIPS® POZIDRIV® ACR® POZISQUARE® PHILLIPS SQUARE-DRIV® TORQ-SET® TRI-WING® MORTORQ®
HEXSTIX® POZILOCK® ARE REGISTERED TRADEMARKS OF THE PHILLIPS SCREW COMPANY

REVISION
A TWCN 8 5-8-68
B TWCN 19 8-2-68
C TWCN 22 9-24-68
D ECO 39 5-13-83
E REISSUED 1/ ECO 94 5-15-92
2/ ECO 123 8-30-96
3/ ECO 127 3-3-97



RECESS NO.	SCREW SIZE	PUNCH NO.	±.002 A	±.0005 D	F	+.000 −.002 G	REF. J	+.001 −.000 K	+.001 −.000 L	RAD. P	RAD. R	+.000 −.004 S	MIN. FACE DIA. Y	PUNCH PEN.
4	10	TW08−1−1	.210	.5625	.0445 .0435	.095	.075	.212	.105	.008 .005	.022 .019	1.000	.375	.0590 .0540
5	1/4	TW10−1−1	.243		.0505 .0495	.142	.076				.438		.0520 .0470	
6	5/16	TW25−1−1	.320	.8750	.0625 .0615	.182	.102				.594		.0705 .0655	
7	3/8	TW31−1−1	.390	1.0000	.0755 .0745	.185	.136				.010 .005		.688	.1035 .0985

NOTE: (1) NIB TO BE CONCENTRIC WITH AXIS WITHIN .005 T.I.R.

(2) PUNCH FACE TO BE SMOOTH, SQUARE WITH AXIS AND PRODUCE A FLAT SURFACE ON PRODUCT.

REVISION
A TWCN 8 5-8-68
B TWCN 19 8-2-68
C TWCN 22 9-24-68
D REISSUED 11-26-90

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TITLE:

TRI-WING® **100° FLAT HEAD SHEAR BOLT PUNCH**

DRAWN:

K. N.

DATE:

04-15-68

DRAWING NUMBER

TWP-13

CHECKED:

G. LaMONICA

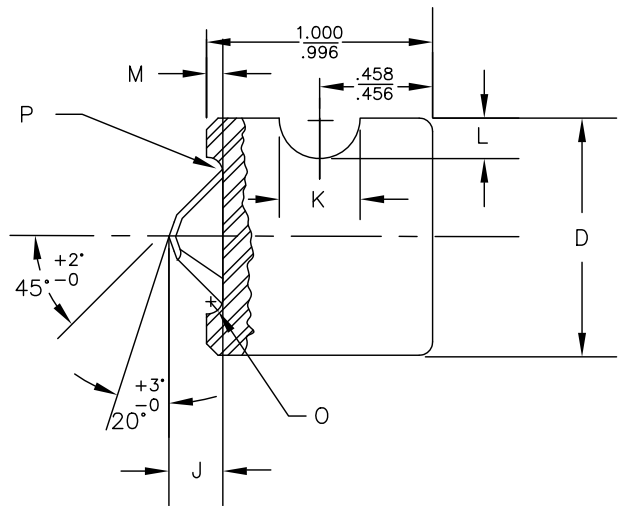
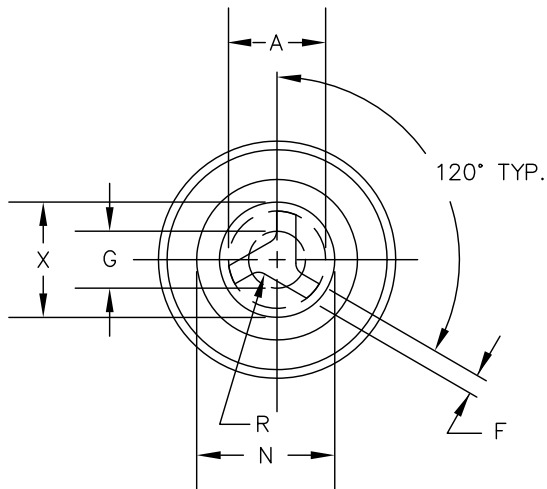
DATE:

3-28-06

SHEET 1 OF 1

PHILLIPS SCREW CO. 155 FARM STREET, BELLINGHAM, MA 02019 U.S.A.
PHONE: 774-396-6190 FAX: 508-966-2326

PHILLIPS II® PHILLIPS® POZIDRIV® ACR® POZISQUARE® PHILLIPS SQUARE-DRIV® TORQ-SET® TRI-WING® MORTORQ®
HEXSTIX® POZILOCK® ARE REGISTERED TRADEMARKS OF THE PHILLIPS SCREW COMPANY



RECESS NO.	SCREW SIZE	PUNCH NO.	±.002 A	±.0005 D	F	+.000 -.002 G	REF. J	+.001 -.000 K	+.001 -.000 L	+.002 -.000 M	+.005 -.000 N	REF. O	RAD. P	RAD. R	±.003 FLAT DIA. X	PUNCH PEN.
0	0	TW00-11-1	.077	.4375	.0205 .0195	.036	.027	.125	.061	.029	.106	.008	.005 .003	.008 .003	.089	.0220 .0180
1	2	TW02-11-1	.110		.0245 .0235	.051	.039			.038	.157	.017			.122	.0310 .0270
2	4	TW04-11-1	.143		.0315 .0305	.066	.051			.049	.209	.027			.155	.0400 .0360
3	6	TW06-11-1	.177		.0395 .0385	.081	.063			.064	.260	.035			.189	.0495 .0445
4	8	TW08-11-1	.210	.5625	.0445 .0435	.095	.075	.212	.105	.077	.312	.042	.008 .005	.022 .019	.228	.0590 .0540
5	10	TW10-11-1	.243		.0505 .0495	.142	.076			.086	.363	.051			.261	.0520 .0470
6	1/4	TW25-12-1	.299	.8750	.0625 .0615	.182	.092			.115	.482	.076	.010 .005	.027 .024	.320	.0600 .0550
7	5/16	TW31-12-1	.354	1.0000	.0755 .0745	.185	.118			.125	.605	.108			.379	.0855 .0805
8	3/8	TW37-12-1	.402	1.2500	.0875 .0865	.172	.146			.148	.730	.144	.012 .005	.034 .029	.427	.1160 .1110
9	7/16	TW43-12-1	.465	1.5000	.1005 .0985	.197	.170			.166	.853	.172			.494	.1350 .1300
10	1/2	TW50-12-1	.531		.1125 .1105	.222	.195			.164	.977	.199			.560	.1555 .1505

REVISION
A. TWCN 35 8-21-69
B. TWCN 42 3-18-71
C. REISSUED 11-26-90

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TITLE:

TRI-WING® MODIFIED PAN HEAD PUNCH

DRAWN:
L. A. P.

DATE:
10-29-68

DRAWING NUMBER

TWP-14

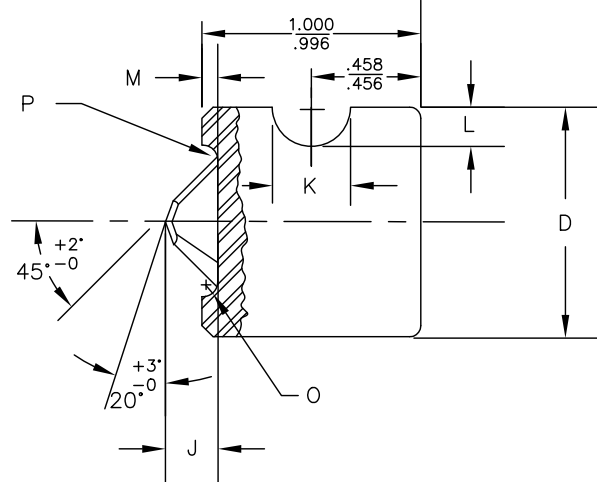
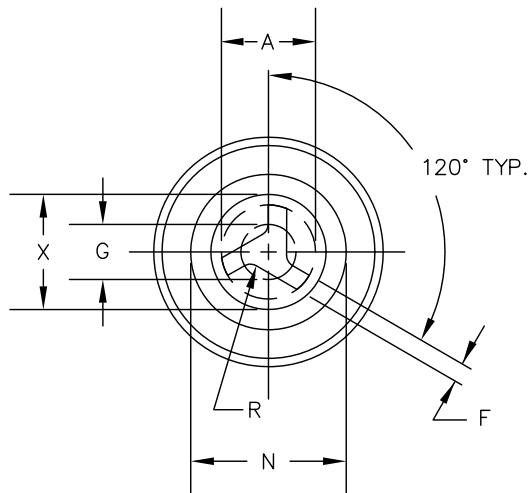
CHECKED:
G. LaMONICA

DATE:
3-28-06

SHEET 1 OF 1

PHILLIPS SCREW CO. 155 FARM STREET, BELLINGHAM, MA 02019 U.S.A.
PHONE: 774-396-6190 FAX: 508-966-2326

PHILLIPS II® PHILLIPS® POZIDRIV® ACR® POZISQUARE® PHILLIPS SQUARE-DRIV® TORQ-SET® TRI-WING® MORTORQ®
HEXSTIX® POZILOCK® ARE REGISTERED TRADEMARKS OF THE PHILLIPS SCREW COMPANY



RECESS NO.	SCREW SIZE	PUNCH NO.	±.002 A	±.0005 D	F	+.000 -.002 G	REF. J	+.001 -.000 K	+.001 -.000 L	+.002 -.000 M	+.005 -.000 N	REF. O	RAD. P	RAD. R	±.003 FLAT DIA. X	PUNCH PEN.
4	10	TW08-11-2	.243	.5625	.0445 .0435	.095	.091	.212	.105	.086	.363	.051	.008 .005	.022 .019	.261	.0755 .0705
6	5/16	TW25-12-94	.354	1.0000	.0625 .0615	.182	.119	.212	.105	.125	.605	.076	.008 .005	.027 .024	.379	.0875 .0825

REVISION
A REISSUED
11-26-90

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TITLE:

TRI-WING® DEEP RECESS MODIFIED PAN HEAD PUNCH

DRAWN:

C. M. B.

DATE:

04-18-75

DRAWING NUMBER

TWP-14A

CHECKED:

G. LaMONICA

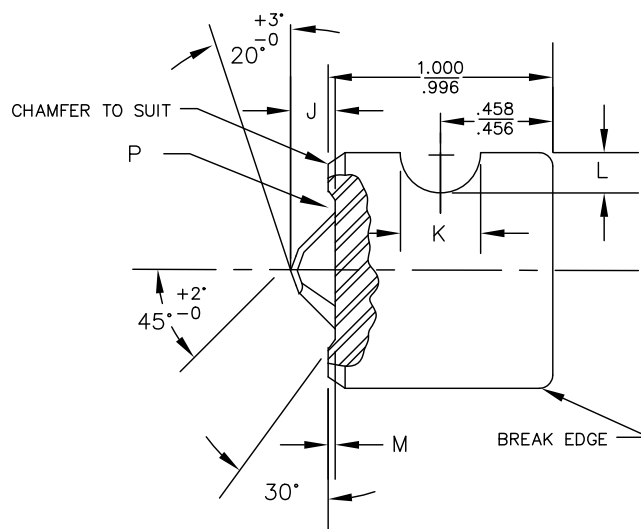
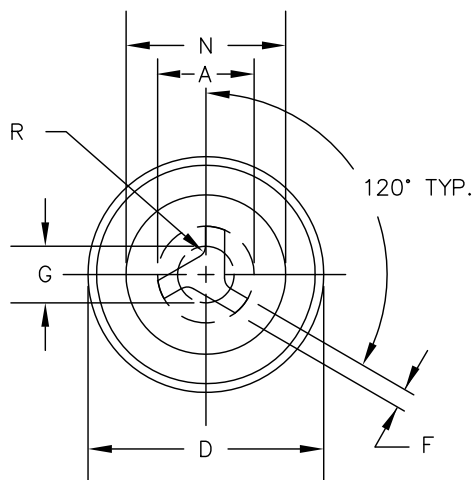
DATE:

03-28-06

SHEET 1 OF 1

PHILLIPS SCREW CO. 155 FARM STREET, BELLINGHAM, MA 02019 U.S.A.
PHONE: 774-396-6190 FAX: 508-966-2326

PHILLIPS II® PHILLIPS® POZIDRIV® ACR® POZISQUARE® PHILLIPS SQUARE-DRIV® TORQ-SET® TRI-WING® MORTORQ®
HEXSTIX® POZILOCK® ARE REGISTERED TRADEMARKS OF THE PHILLIPS SCREW COMPANY



RECESS NO.	SCREW SIZE	PUNCH NO.	$\pm .002$ A	$\pm .0005$ D	F	$+.000$ $-.002$ G	REF. J	$+.001$ $-.000$ K	$+.001$ $-.000$ L	$+.002$ $-.000$ M	$+.005$ $-.000$ N	RAD. P	$+.005$ $-.000$ Q	RAD. R	PUNCH PEN.
2	4	TW04-10-1	.143	.4375	.0315 .0305	.066	.051	.125	.061	.014	.236	.005 .003	.188	.012 .009	.0400 .0360
3	6	TW06-10-1	.177		.0395 .0385	.081	.063							.022 .019	.0495 .0445
4	8	TW08-10-1	.210	.5625	.0445 .0435	.095	.075	.212	.105	.029	.330	.008 .005	.230	.022 .019	.0590 .0540
5	10	TW10-10-1	.243		.0505 .0495	.142	.076			.035	.410		.290	.027 .024	.0520 .0470

NOTE: (1) NIB TO BE CONCENTRIC WITH AXIS WITHIN .005 T.I.R.

(2) PUNCH FACE TO BE SMOOTH AND SQUARE WITH AXIS

REVISION
A REISSUED
11-26-90

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TITLE:

TRI-WING® WASHER FACE TRIMMED HEXAGON HEAD PUNCH

DRAWN:

L. A. P.

DATE:

11-05-68

DRAWING NUMBER

TWP-16

CHECKED:

G. LaMONICA

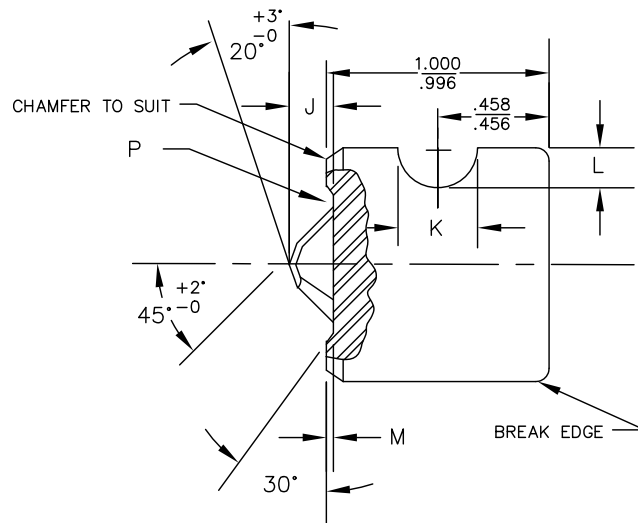
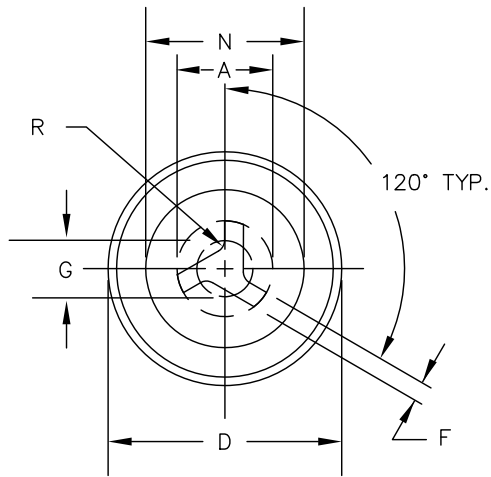
DATE:

03-28-06

SHEET 1 OF 1

PHILLIPS SCREW CO. 155 FARM STREET, BELLINGHAM, MA 02019 U.S.A.
PHONE: 774-396-6190 FAX: 508-966-2326

PHILLIPS II® PHILLIPS® POZIDRIV® ACR® POZISQUARE® PHILLIPS SQUARE-DRIV® TORQ-SET® TRI-WING® MORTORQ®
HEXSTIX® POZILOCK® ARE REGISTERED TRADEMARKS OF THE PHILLIPS SCREW COMPANY



RECESS NO.	SCREW SIZE	PUNCH NO.	±.002 A	±.0005 D	F	+.000 -.002 G	REF. J	+.001 -.000 K	+.001 -.000 L	+.002 -.000 M	+.005 -.000 N	RAD. P	+.005 -.000 Q	RAD. R	PUNCH PEN.
4	10	TW08-10-35	.243	.5625	.0445 .0435	.095	.091	.212	.105	.035	.410	.008 .005	.290	.022 .019	.0755 .0705

NOTE: (1) NIB TO BE CONCENTRIC WITH AXIS WITHIN .005 T.I.R.

(2) PUNCH FACE TO BE SMOOTH AND SQUARE WITH AXIS

REVISION
A REISSUED
11-26-90

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TITLE:

**TRI-WING® DEEP REC. WASHER FACE
TRIMMED HEXAGON HEAD PUNCH**

DRAWN:

C. M. B.

DATE:

04-18-75

DRAWING NUMBER

TWP-16A

CHECKED:

G. LaMONICA

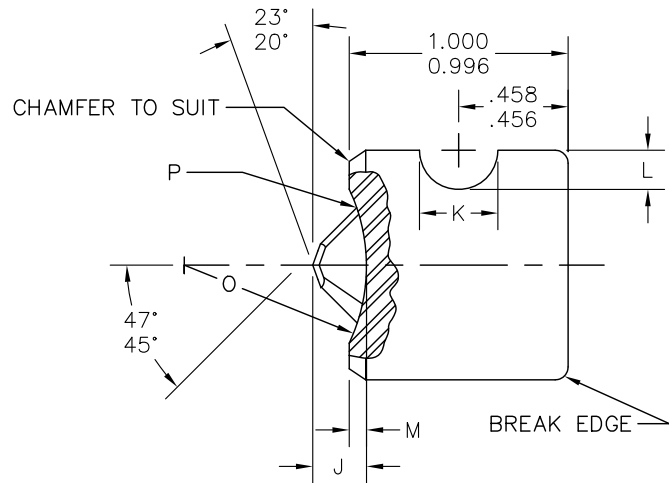
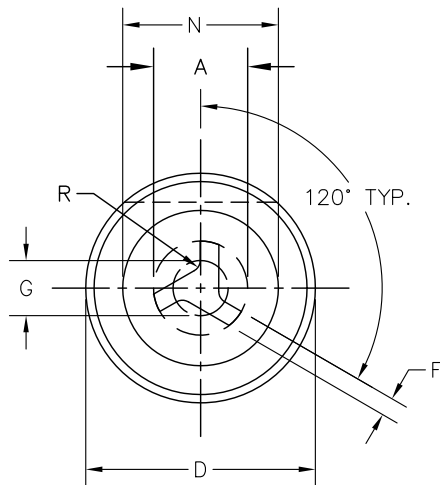
DATE:

03-28-06

SHEET 1 OF 1

PHILLIPS SCREW CO. 155 FARM STREET, BELLINGHAM, MA 02019 U.S.A.
PHONE: 774-396-6190 FAX: 508-966-2326

PHILLIPS II® PHILLIPS® POZIDRIV® ACR® POZISQUARE® PHILLIPS SQUARE-DRIV® TORQ-SET® TRI-WING® MORTORQ®
HEXSTIX® POZILOCK® ARE REGISTERED TRADEMARKS OF THE PHILLIPS SCREW COMPANY



RECESS NO.	SCREW SIZE	PUNCH NO.	±.002 A	±.0005 D	F	+.000 -.002 G	REF. J	+.001 -.000 K	+.001 -.000 L	+.002 -.000 M	+.005 -.000 N	+.005 -.000 O	RAD. P	RAD. R	PUNCH PEN.
2	4	TW04-3-1	.143	.4375	.0315 .0305	.066	.061	.125	.061	.026	.221	.248	.005 .003	.012 .009	.0415 .0375
3	6	TW06-3-1	.177		.0395 .0385	.081	.076			.033	.274	.301		.022 .019	.0520 .0470
4	8	TW08-3-1	.210	.5625	.0445 .0435	.095	.091			.040	.326	.352	.008 .005		.0620 .0570
5	10	TW10-3-1	.243		.0505 .0495	.142	.095			.046	.379	.413			.0535 .0485
5	12	TW12-3-1	.276		.0505 .0495	.142	.115			.053	.431	.464			.0655 .0605
6	1/4	TW25-3-1	.320	.8750	.0625 .0615	.182	.127	.212	.105	.062	.500	.535	.010 .005	.027 .024	.0730 .0680
7	5/16	TW31-3-1	.390	1.0000	.0755 .0745	.185	.165			.078	.627	.669			.1080 .1030
8	3/8	TW37-3-1	.422	1.2500	.0875 .0865	.172	.185			.096	.752	.784		.034 .029	.1280 .1230

NOTE: (1) NIB TO BE CONCENTRIC WITH AXIS WITHIN .005 T.I.R.

(2) PUNCH FACE TO BE SMOOTH AND SQUARE WITH AXIS

REVISION
A TWCN 27
6-4-70
B REISSUED
11-26-90
C REVISED
12-01-08

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TITLE:

TRI-WING® 100° OVAL HEAD PUNCH

DRAWN:
L. Dougan

DATE:
12-01-08

DRAWING NUMBER

TWP-17

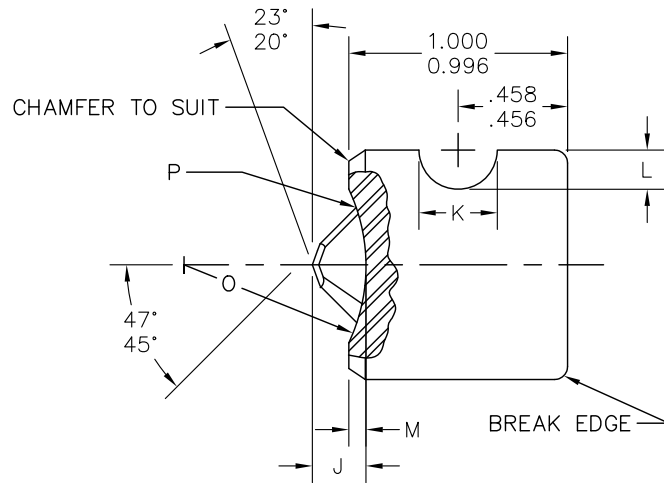
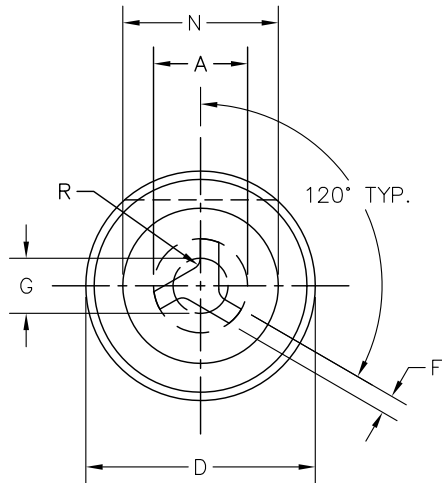
CHECKED:
G. Dilling

DATE:
12-01-08

SHEET 1 OF 1

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PHONE: 774-396-6190 FAX: 508-966-2326

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HEXSTIX® POZILOCK® ARE REGISTERED TRADEMARKS OF THE PHILLIPS SCREW COMPANY



RECESS NO.	SCREW SIZE	PUNCH NO.	±.002 A	±.0005 D	F	+.000 -.002 G	REF. J	+.001 -.000 K	+.001 -.000 L	+.002 -.000 M	+.005 -.000 N	+.005 -.000 O	RAD. P	RAD. R	PUNCH PEN.
4	10	TW08-3-10	.243	.5625	.0445 .0435	.095	.110	.212	.105	.046	.379	.413	.008 .005	.022 .019	.0825 .0775
6	5/16	TW25-3-4	.390	1.0000	.0625 .0615	.182	.166	.212	.105	.078	.627	.669	.008 .005	.027 .024	.1165 .1115

NOTE: (1) NIB TO BE CONCENTRIC WITH AXIS WITHIN .005 T.I.R.

(2) PUNCH FACE TO BE SMOOTH AND SQUARE WITH AXIS

REVISION
A REISSUED
10-21-90
B REVISED
12-01-08

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TITLE:

TRI-WING® DEEP RECESS 100° OVAL HEAD PUNCH

DRAWN:
C. M. B.

DATE:
04-18-75

DRAWING NUMBER

CHECKED:
G. LaMONICA

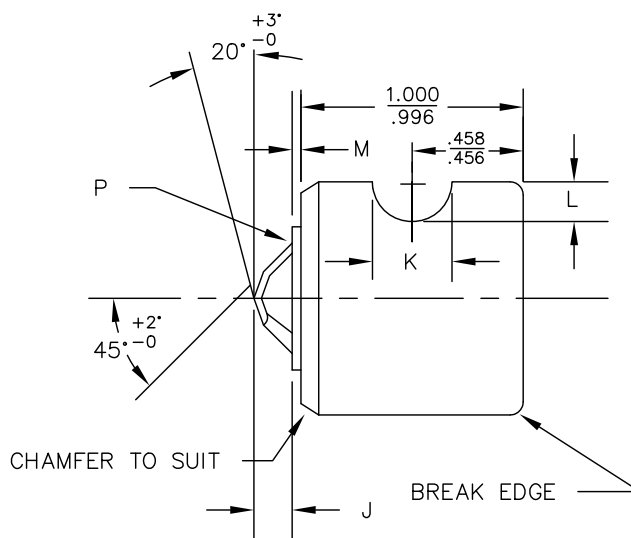
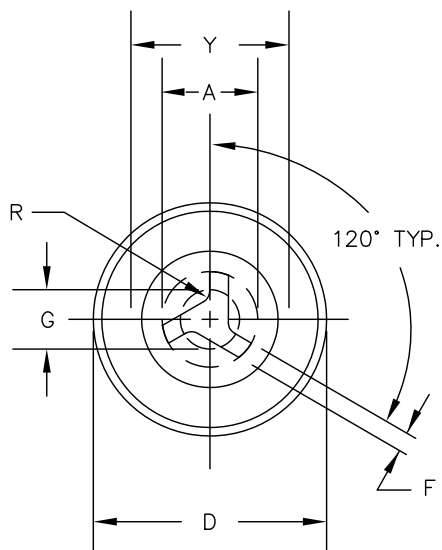
DATE:
02-24-05

TWP-17A

SHEET 1 OF 1

PHILLIPS SCREW CO. 155 FARM STREET, BELLINGHAM, MA 02019 U.S.A.
PHONE: 774-396-6190 FAX: 508-966-2326

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HEXSTIX® POZILOCK® ARE REGISTERED TRADEMARKS OF THE PHILLIPS SCREW COMPANY



RECESS NO.	SCREW SIZE	PUNCH NO.	±.002 A	±.0005 D	F	+.000 -.002 G	REF. J	+.001 -.000 K	+.001 -.000 L	+.002 -.000 M	+.005 -.000 N	RAD. P	RAD. R	PUNCH PEN.
2	4	TW04-9-1	.135	.4375	.0315 .0305	.066	.046	.125	.061	.008	.153	.005 .003	.012 .009	.0460 .0420
3	6	TW06-9-1	.177		.0395 .0385	.081	.063							
4	8	TW08-9-1	.187	.5625	.0445 .0435	.095	.063	.212	.105	.018	.210	.008 .005	.022 .019	.0675 .0625
5	10	TW10-9-1	.243		.0505 .0495	.142	.076							
										.020	.270		.027 .024	.0740 .0690

NOTE: (1) NIB TO BE CONCENTRIC WITH AXIS WITHIN .005 T.I.R.

(2) PUNCH FACE TO BE SMOOTH AND SQUARE WITH AXIS.

(3) PUNCH PENETRATION INCLUDES "M" MAX. DIMENSION.

REVISION
A REISSUED
11-26-90

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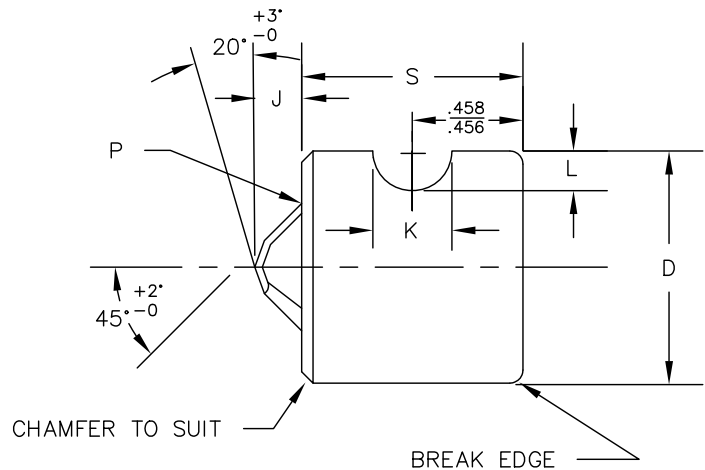
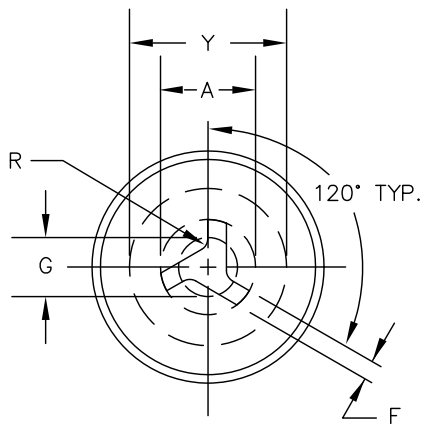
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TITLE: **TRI-WING® WASHER FACE
INDENTED HEXAGON HEAD PUNCH**

DRAWN: L. A. P.	DATE: 11-06-68	DRAWING NUMBER TWP-18 SHEET 1 OF 1
CHECKED: G. LaMONICA	DATE: 03-28-06	

PHILLIPS SCREW CO. 155 FARM STREET, BELLINGHAM, MA 02019 U.S.A.
PHONE: 774-396-6190 FAX: 508-966-2326

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RECESS NO.	SCREW SIZE	PUNCH NO.	±.002 A	±.0005 D	F	+ .000 −.002 G	REF. J	+ .001 −.000 K	+ .001 −.000 L	RAD. P	RAD. R	+ .000 −.004 S	MIN. FACE DIA. Y	PUNCH PEN	
5	10	TW10−1−291	.275	.5625	.0505 .0495	.142	.092	.212	.105	.008 .005	.027 .024	1.000	.438	.0680 .0630	
6	1/4	TW25−1−147	.354	.8750	.0625 .0615	.182	.119			.010 .005			.594	.0875 .0825	
7	5/16	TW31−1−48	.426	1.0000	.0755 .0745	.185	.154						.034 .029	.688	.1215 .1165
8	3/8	TW37−1−6	.462		.0875 .0865	.172	.176							.844	.1460 .1410
9	7/16	TW43−1−5	.537	1.2500	.1005 .0985	.197	.206				.012 .005		.944	.1710 .1660	
10	1/2	TW50−1−9	.611		.1125 .1105	.222	.235			.052 .047			1.062	.1955 .1905	

THESE PUNCHES HAVE DEEPER THAN STANDARD RECESSES
AND ARE INTENDED FOR USE WHEN SUBSEQUENT TOP-OF
THE-HEAD MACHINING IS REQUIRED. FINISHED PRODUCTS
SHALL CONFORM TO THE REQUIREMENTS OF TWHS-1.

REVISED AND REDRAWN 12/20/71

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TITLE: **SPECIAL HOT FORGING PUNCH
TRI-WING® 100° FLAT HEAD SCREWS**

DRAWN:
A. P. C.

DATE:
08-31-71

DRAWING NUMBER

PIC-541

CHECKED:
G. LaMONICA

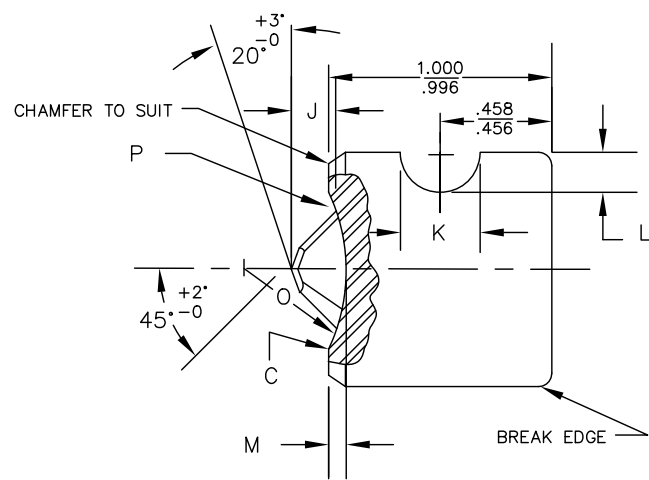
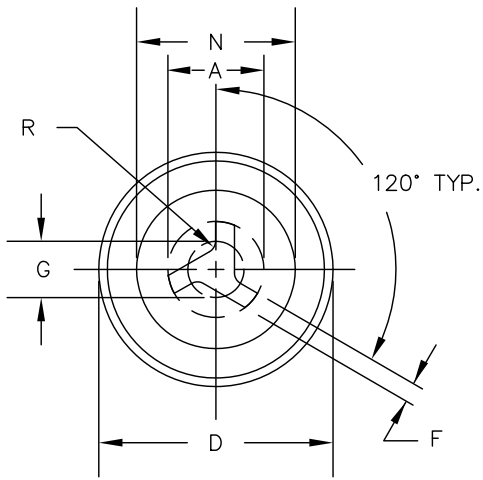
DATE:
02-24-05

SHEET 1 OF 1

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REVISION
A TWON 44 12-20-71
B TWON 45 1-19-72
C REISSUED 11-26-90



RECESS NO.	SCREW SIZE	PUNCH NO.	±.002 A	±.0005 D	F	+.000 - .002 G	REF. J	+.001 - .000 K	L	+.003 RAD. C	+.002 - .000 M	+.005 - .000 N	+.005 - .000 O	RAD. P	RAD. R	PUNCH PEN.
2	4	TW04-7-1	.143	.4375	.0315 .0305	.066		.125	.061					.005 .003	.012 .009	
3	6	TW06-7-1	.177		.0395 .0385	.081									.022 .019	
4	8	TW08-7-1	.210	.5625	.0445 .0435	.095	.093	.212	.105	.080	.061	.307	.310			.0625 .0575
5	10	TW10-7-1	.243		.0505 .0495	.142	.095			.080	.066	.370	.400	.008 .005		.0535 .0485
6	1/4	TW25-7-1	.299	.8750	.0625 .0615	.182	.116			.100	.070	.433	.470		.027 .024	.0590 .0540
7	5/16	TW31-7-1	.354	1.0000	.0755 .0745	.185								.010 .005		
8	3/8	TW37-7-1	.402	1.2500	.0875 .0865	.172									.034 .029	

NOTE: (1) NIB TO BE CONCENTRIC WITH AXIS WITHIN .005 T.I.R.

(2) PUNCH FACE TO BE SMOOTH AND SQUARE WITH AXIS

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A PCN 14 8-12-76
B REISSUED 11-26-90

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TITLE:

TRI-WING® PUNCH FOR WASHER HEAD DOUBLE RADIUS

DRAWN:

A. P. C.

DATE:

01-02-74

DRAWING NUMBER

PIC-549

CHECKED:

G. LaMONICA

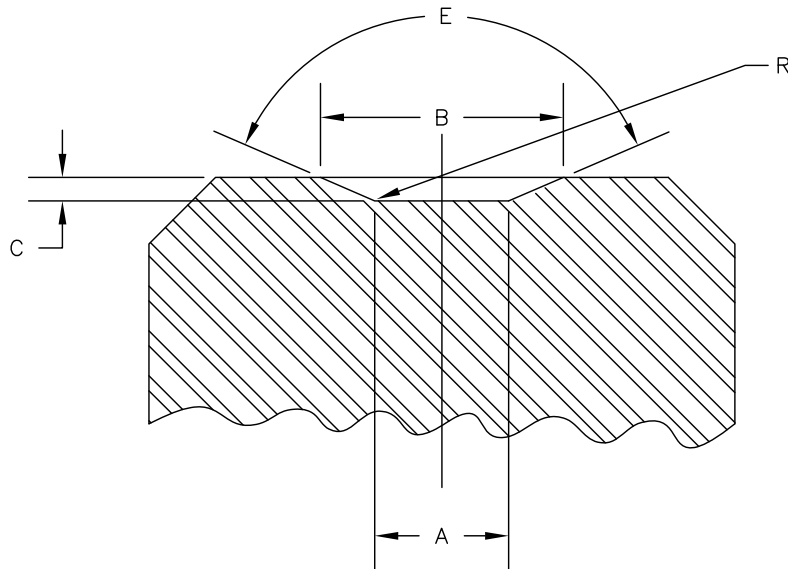
DATE:

03-29-06

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SCREW SIZE	±.002 A	±.002 B	REF. C	REF. E	R
8					
10	.189	.297	.023	134°	
1/4	.253	.392	.031	132°	
5/16	.288	.484	.036	140°	.063
3/8	.351	.585	.043		
7/16	.620	.825	.062	118°	
1/2					
9/16					

NOTE: (1) REFER TO TWHS-1 FOR FINISHED HEAD OUTLINE

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TITLE: **TRI-WING® 100° FLUSH HEAD
SPRING PUNCH IMPRESSION**

DRAWN:
L. A. P.

DATE:
07-18-69

DRAWING NUMBER

TWSP-1

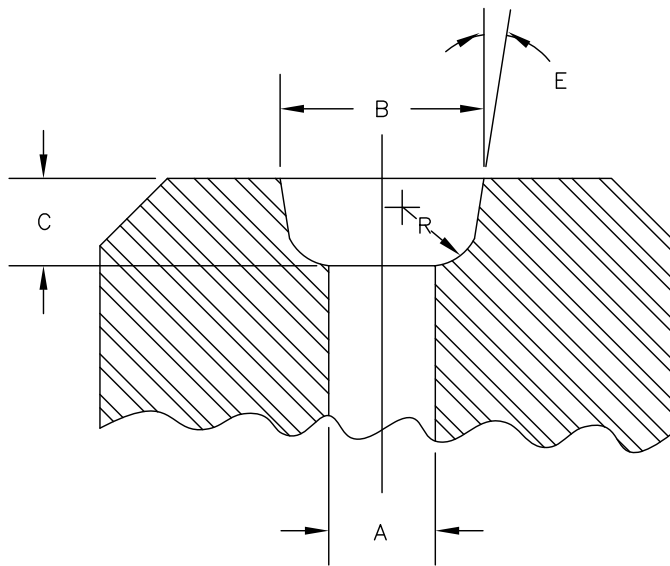
CHECKED:
G. LaMONICA

DATE:
02-24-05

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SCREW SIZE	+ .001 - .000 A	+ .002 - .000 B	REF. C	E	R
8	.141	.269	.144	8°45'	.094
10	.186	.316	.165	8°45'	.140
1/4	.248	.403	.200	10°00'	.109
5/16	.308	.519	.260	8°00'	.147

NOTE: (1) REFER TO TWHS-4 FOR FINISHED HEAD OUTLINE

A. REISSUED
11-26-90

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TITLE:

TRI-WING® MODIFIED PAN HEAD SPRING PUNCH IMPRESSION

DRAWN:

L. A. P.

DATE:

07-18-69

DRAWING NUMBER

TWSP-4

CHECKED:

G. LaMONICA

DATE:

03-28-06

SHEET 1 OF 1

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TRI-WING[®] DRIVE SYSTEM

QUALITY SPECIFICATIONS

INDEX

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TWQ-1	DRIVER BIT INSPECTION PROCEDURES	5-15-13
TWQ-2	RECESS INSPECTION PROCEDURES	5-15-13
TWQ-3	PUNCH INSPECTION PROCEDURES	5-15-13

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TITLE:

TRI-WING[®]

QUALITY SPECIFICATIONS

DRAWN

L.DOUGAN

DATE

5-15-13

DRAWING NUMBER

CHECKED:

G.DILLING

DATE

5-16-13

INDEX

SHEET 1 OF 1

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PHILLIPS II[®] PHILLIPS[®] POZIDRIV[®] ACR[®] POZISQUARE[®] PHILLIPS SQUARE-DRIV[®] TORQ-SET[®] TRI-WING[®] MORTORQ[®]
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TRI-WING[®] DRIVE SYSTEM QUALITY SPECIFICATIONS

1.0 SCOPE:

This quality specification defines inspection plans and procedures for initial inspection requirements, first article inspection, and final conformance inspection of TRI-WING Tri-Form drive system driver bits, punches and recesses.

Inspection practice in accordance with procedures, sampling plans and specified gages set forth herein will guarantee product uniformity for dimension, appearance and function.

2.0 INSPECTION PLANS:

2.1 Initial Qualification:

Phillips Screw Company shall perform the initial qualification inspection for all new products as required under the license agreement.

A minimum of 50 pieces of each TRI-WING Tri-Form drive system drive size and head style are to be qualified. Phillips Screw Company shall retain 25 pieces for reference material.

2.2 Periodic Inspection:

Every (4) months a letter is sent requesting a minimum of 5 pieces of each TRI-WING Tri-Form drive system size and head style, as required by the license agreement.

2.3 First Article Inspection:

A first article inspection is required. Any defects found by visual inspection or gage readings beyond the stated limits, is reason for rejection and corrective action is required.

2.4 Final Quality Conformance Inspection:

Typical industry standards for sampling shall be used for each lot size. These samples will be inspected for visual and dimensional characteristics.

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TITLE:

TRI-WING[®]

QUALITY SPECIFICATIONS

DRAWN

L.DOUGAN

DATE

5-15-13

DRAWING NUMBER

TWQ-0

SHEET 1 OF 1

CHECKED:

G.DILLING

DATE

5-16-13

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TRI-WING® TRI-FORM DRIVE SYSTEM QUALITY SPECIFICATIONS

BIT AND DRIVER INSPECTION PROCEDURES AND SPECIFICATIONS:

1.0 SCOPE:

The following document covers the equipment, procedures, test values and inspection criteria for TRI-WING drive system screwdrivers, insert bits and power bits.

2.0 APPLICABLE DRAWINGS:

2.1 Insert driver bits:

TWD-1; TWD-4; TWD-5; TWD-6; TWD-7; TWD-8; TWD-9

2.2 Hand Screwdrivers:

TWD-2

2.3 Driver bit and screw driver manufacturing gages:

TWG-3; TWG-6

2.4 Torque test blocks:

TWD-3

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TITLE:

TRI-WING® BIT AND DRIVER INSPECTION

DRAWN

L.DOUGAN

DATE

5-15-13

DRAWING NUMBER

TWQ-1

CHECKED:

G.DILLING

DATE

5-16-13

SHEET 1 OF 4

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3.0 : REQUIREMENTS

3.1 Dimensions:

All bit and driver points shall conform to Phillips Screw Company's drawings TWD-1; TWD-2; TWD-4; TWD-5; TWD-6; TWD-7; TWD-8 or TWD-9 for all standard TRI-WING drive designs.

3.2 Quality:

The workmanship shall be of the highest quality throughout. Bits and screwdrivers shall be free from rust, fins, burrs, sharp or rough edges, corners or surfaces and defects that may impair their serviceability or durability.

3.3 Materials:

Screwdrivers and bits shall be made from the following recommended, equivalent or superior material:

3.3.1 Hand Screwdrivers - These drivers shall be made from AISI S2 steel or equivalent, and heat-treated to a hardness of HRC 58-63.

3.3.2 Insert and Power bits - These bits shall be made from AISI S2 steel or equivalent and heat-treated to a hardness of HRC 58-63.

3.3.3 Steel AISI S2 Type Analysis

Carbon .50 - .55

Manganese .45 - .55

Silicon .90 - 1.10

Molybdenum .45 - .55

Vanadium .15 - .25

3.4 Markings:

3.4.1 TRI-WING bit marking shall consist of the recess number encircled approximately 1/16" high. Manufactures may also include company names, trademark, trade names, part numbers etc. if so desired.

3.4.2 In the case of hand screwdrivers, the handle and ferrule may be utilized for the above marking.

3.4.3 In the case of insert bits, if insufficient space is available for marking, the package or shipping container shall include the required identification.

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TITLE:

TRI-WING[®] BIT AND DRIVER INSPECTION

DRAWN

L.DOUGAN

DATE

5-15-13

DRAWING NUMBER

TWQ-1

CHECKED:

G.DILLING

DATE

5-16-13

SHEET 2 OF 4

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3.5 Bit Torsional Strength:

3.5.1 Drive size	Minimal Torsional Strength: Torque (Lb ins)	Fatigue Torque Limit: (Lb ins.) ±10 %
---------------------	--	--

TW-0	---	---
TW-1	---	---
TW-2	---	---
TW-3	40	24
TW-4	75	45
TW-5	110	66
TW-6	300	180
TW-7	450	270
TW-8	700	420
TW-9	1050	630
TW-10	1300	780
TW-11	1780	1068
TW-12	2580	1548
TW-13	---	---
TW-14	---	---
TW-15	---	---

3.5.2 Test blocks:

Screwdrivers and bits shall be tested in the test blocks having the same form and size of the recess as the bit being tested. Screwdriver and bit test blocks shall be in accordance with drawing TWD-3

3.5.3 Test procedures: The torsional loads shall be applied either with suitable torque wrenches or by means of a suitable lever system with dead weights. The driver or bit must be inserted fully into the test block and restrained in a hold down device to provide firm engagement with no axial movement.

The torsional load at failure shall be taken as the strength of the driver bit.

The failure load must exceed the minimum torsional strength as shown in paragraph 3.5.1

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TITLE:

TRI-WING® BIT AND DRIVER INSPECTION

DRAWN

L.DOUGAN

DATE

5-15-13

DRAWING NUMBER

TWQ-1

CHECKED:

G.DILLING

DATE

5-16-13

SHEET 3 OF 4

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3.6 Gaging:

3.6.1 GO Gage (Bit Wafer Gage or GO Ground-Slot Bit Gage):

The TRI-WING system driver bit must go into the appropriate GO gage (TWG-3 or TWG-6) and extend into the gage for the minimum "full form" length (J) dimension as shown on the appropriate driver point drawing (TWD-1; TWD-2; TWD-4; TWD-5; TWD-6; TWD-7, TWD-8 or TWD-9).

3.6.2 NO-GO (Ground-Slot Bit Gage):

The driver bit must not enter the appropriate NO-GO gage (NO-GO TWG-6).

4.0 PHYSICAL PROPERTIES

4.1 Discontinuities:

Driver bits shall be free from discontinuities such as laps, seams or inclusions greater in depth than 2 percent of the thickness at the discontinuity location.

4.2 Cracks:

Driver bits shall be free from cracks in any location or direction. A crack is defined as a clean crystalline break through the grain or grain boundary without inclusion of foreign elements.

5.0 QUALITY ASSURANCE PROVISIONS:

5.1 Responsibility for Inspection:

Unless otherwise specified in the contract or order, the manufacturer is responsible for the performance of all quality conformance inspection requirements as specified herein.

5.2 Change of Product:

After initial approval, any change of product as regards to materials, design, construction, or methods of manufacture shall require review and approval of Phillips Screw Company and may require qualification testing prior to incorporation into production lots.

5.3 Qualification Testing:

Qualification testing shall be performed per section 3.0 of this drawing.

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TITLE:

TRI-WING® BIT AND DRIVER INSPECTION

DRAWN
L.DOUGAN

DATE
5-15-13

DRAWING NUMBER

TWQ-1

CHECKED:
G.DILLING

DATE
5-16-13

SHEET 4 OF 4

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TRI-WING[®] TRI-FORM DRIVE SYSTEM QUALITY SPECIFICATIONS

RECESS INSPECTION PROCEDURES AND SPECIFICATIONS:

1.0 SCOPE:

The following document covers the equipment, procedures, test values and inspection criteria for TRI-WING Tri-Form drive system recesses.

2.0 APPLICABLE DRAWINGS:

2.1 Screw Recess GO, NO-GO gages

TWG-2

2.2 Recess Penetration Gage Assy:

TWG-1

2.3 Recess Fallaway Gage Assy:

TWG-7

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TITLE:

TRI-WING[®]
RECESS INSPECTION

DRAWN

L.DOUGAN

DATE

5-15-13

DRAWING NUMBER

TWG-2

CHECKED:

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5-16-13

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3.0 REQUIREMENTS:

3.1 Dimensions:

All TRI-WING® Tri-Form drive system recesses shall conform to the appropriate Phillips Screw Company head standards.

3.2 Quality:

The workmanship shall be of the highest quality throughout. Recesses shall be free from rust, fins, burrs, sharp or rough edges, corners or surfaces and defects that may impair their serviceability or durability.

3.3 Markings:

3.3.1 No special marking is required.

3.4 Gaging:

3.4.1 GO Plug Gage:

Using light finger pressure only, place the appropriate GO gage (TWG-2) into the recess until resistance is felt.

Failure to bottom the gage in the recess shall be cause for rejection.

3.4.2 NO-GO Plug Gage:

Using light finger pressure only, attempt to place the appropriate NO-GO gage (TWG-2) into the recess.

Gage entry beyond the acceptable fallaway limit at the head surface is cause for rejection.

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TITLE:

TRI-WING® RECESS INSPECTION

DRAWN

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DATE

5-15-13

DRAWING NUMBER

TWQ-2

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3.4.3 Penetration Gage:

Using the appropriate size penetration gage (TWG-1; TWSG-1), check the zero adjustment against a known flat piece of steel stock.

Insert the penetration element into the TRI-WING drive system recess and firmly push the top of the recess against the bottom of the gage body.

Measure and record the gage penetration. The reading must be within acceptable limits per the application part standard.

Gage readings outside the stated limits are cause for rejection.

3.4.4 Fallaway gage:

Fallaway is a condition whereby the material of the screw does not completely conform to the shape of the header punch that produced it.

Using the appropriate size fallaway gage (TWG-7), zero the gage against a known flat piece of steel stock:

For hand type gages, the back end of the pin should be flush with the back end of the barrel.

For dial indicator gages, adjust the needle to 0 when zeroed as above.

Insert the fallaway element into the TRI-WING drive system recess and firmly push the top of the recess against the bottom of the gage body.

For hand type gages: If the back end of the gage pin is flush with or projects beyond the back surface of the barrel, the fallaway is acceptable. If the back end of the gage pin is below flush with the back surface of the barrel, the fallaway is excessive.

For dial indicator type gages, any reading above zero on the dial (+) indicates acceptable fallaway. A reading below zero (-) indicates excessive fallaway.

3.4.5 Recess Depth Gaging:

Using a standard depth micrometer, measure and record the depth of the recess point from the recess diameter plane. The depth shall conform to the limits of the applicable parts standard.

Measurements out of tolerance shall be cause for rejection.

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4.0 PHYSICAL PROPERTIES:

4.1 Head Discontinuities:

See FIGURE #1 for examples of head discontinuities that shall be considered "ACCEPTABLE". Screws will be rejected if they exhibit imperfections as shown as "NOT ACCEPTABLE".

5.0 RECESS TO SHANK ECCENTRICITY:

5.1 The recesses in screw heads shall not be eccentric with the screw bodies by more than 6% of the nominal (basic) body diameter or .015", whichever is smaller.

5.2 Generally, this inspection will be most readily accomplished by a simple visual examination.

6.0 QUALITY ASSURANCE PROVISIONS:

6.1 Responsibility for Inspection:

Unless otherwise specified in the contract or order, the manufacturer is responsible for the performance of all quality conformance inspection requirements as specified herein.

6.2 Qualification Testing:

Qualification testing shall be performed per sections 3.0, 4.0 and 5.0 of this drawing.

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TITLE:

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DRAWN

L.DOUGAN

DATE

5-15-13

DRAWING NUMBER

TWQ-2

CHECKED:

G.DILLING

DATE

5-16-13

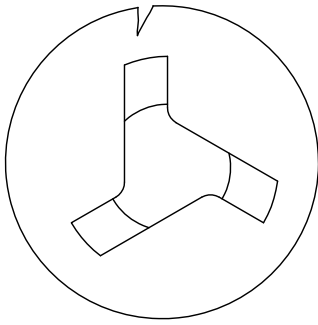
SHEET 4 OF 5

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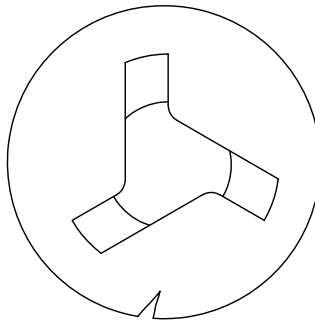
Figure 1

NOT ACCEPTABLE



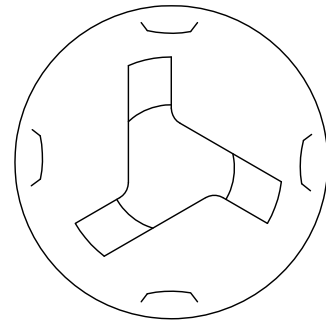
(1)

LARGE OPEN IMPERFECTIONS
EXTENDING OVER 1/2 WAY
TO RECESS



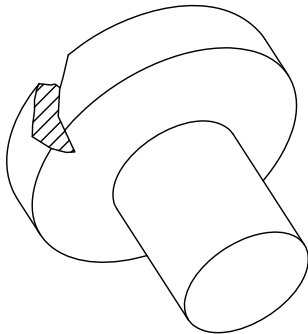
(2)

OPEN ANGULAR IMPERFECTIONS
ON EDGE OF HEAD



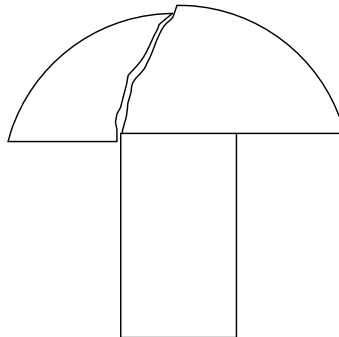
(3)

SLIVERS OR LOOSE
FLAKES ON TOP OF HEAD



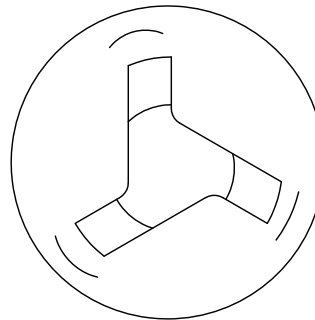
(4)

MULTIPLE IMPERFECTIONS
NOT EXTENDING 1/2 WAY
TO RECESS AND NOT
AFFECTING USEABILITY



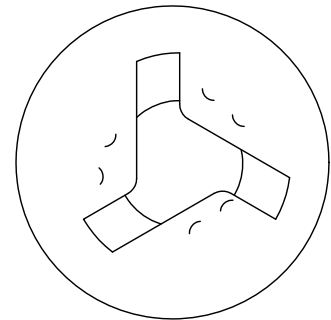
(5)

SLIGHT HAIR LINES



(6)

SLIGHT RECESS FLOW
LINES



(7)

SLIGHT TOOL MARKS
SLIGHT PIN MARKS

ACCEPTABLE

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TITLE:

**TRI-WING®
RECESS INSPECTION**

DRAWN:
DRAWNBY

DATE:
DRAWDATE

DRAWING NUMBER

TWQ-2

CHECKED:
CHECKED

DATE:
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SHEET 5 OF 5

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TRI-WING[®] TRI-FORM DRIVE SYSTEM QUALITY SPECIFICATIONS

PUNCH INSPECTION PROCEDURES AND SPECIFICATIONS:

1.0 SCOPE:

The following document covers the equipment, procedures, test values and inspection criteria for TRI-WING Tri-Form drive system punches.

2.0 APPLICABLE DRAWINGS:

2.1 Punch Recess GO, NO-GO gages:

TWG-2; TWG-5

2.2 Punch Point Dimensions:

TWP-11; 11A; 12; 13; 14; 14A; 16; 16A; 17; 17A; 18
PIC-541; PIC-549

2.3 Recess Penetration Gage Assy:

TWG-1; TWSG-1

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TITLE:

TRI-WING[®]
PUNCH INSPECTION

DRAWN

L. DOUGAN

DATE

5-15-13

DRAWING NUMBER

TWQ-3

CHECKED:

G. DILLING

DATE

5-16-13

SHEET 1 OF 3

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3.0 REQUIREMENTS:

3.1 Dimensions:

All TRI-WING® Tri-Form drive system punches shall conform to the appropriate Phillips Screw Company's punch standards and punch point dimensions as shown in section 2.2.

3.2 Quality:

The workmanship shall be of the highest quality throughout. Punches shall be free from rust, fins, burrs, sharp or rough edges, corners or surfaces and defects that may impair their serviceability or durability.

3.3 Markings:

3.3.1 TRI-WING punches shall be marked according to drawings numbers per section 2.2 (See TWPC-1). Manufactures may also include company names, trademark, trade names, part numbers etc., if they so desired.

3.4 Gaging:

3.4.1 Punches may be inspected using casts, plug and penetration gages. Casts must be made of a good grade casting material. (Buehler® Ultra-mount™ or equivalent)

3.4.2 GO Plug Gage:

Using light finger pressure only, place the appropriate GO gage (TWG-5) into the recess until resistance is felt.

Failure to bottom the gage in the recess shall be cause for rejection.

3.4.3 NO-GO Plug Gage:

Using light finger pressure only, attempt to place the appropriate NO-GO gage (TWG-2) into the recess. Gage entry beyond the recess radius at the face of the punch is cause for rejection.

3.4.4 Special Gages:

Special GO/NO-GO Plug Gages will be required for any non-standard punch recesses.

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DRAWING NUMBER

TWQ-3

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DATE

5-16-13

SHEET 2 OF 3

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3.4.5 Penetration Gage:

Using the appropriate size penetration gage (TWG-1; TWSG-1), check the zero adjustment against a known flat piece of steel stock.

Insert the penetration element into the TRI-WING drive system recess formed in the cast and firmly push the top of the recess against the bottom of the gage body.

Measure and record the gage penetration. The reading must be within acceptable limits per the application part standard.

Gage readings outside the stated limits are cause for rejection.

4.0 QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:

Unless otherwise specified in the contract or order, the manufacturer is responsible for the performance of all quality conformance inspection requirements as specified herein.

4.2 Change of Product:

After initial approval, any change of product as regards to materials, design, construction, or methods of manufacture shall require review and approval of Phillips Screw Company and may require qualification testing prior to incorporation into production lots.

4.3 Qualification Testing:

Qualification testing shall be performed per section 3.0 of this drawing.

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TITLE:

TRI-WING® PUNCH INSPECTION

DRAWN

L. DOUGAN

DATE

5-15-13

DRAWING NUMBER

TWQ-3

CHECKED:

G. DILLING

DATE

5-16-13

SHEET 3 OF 3

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