

PUNCH TOOLING LIST

ROUNDS

Feb 25, 2014

PJW

Punch Size	Station	Punch Size	Punch Qty	Die Clearances			Notes
				.006	.012	Other	
0.062	dia	1/2"	4	3	3		
0.067	dia	1/2"	1			.010	
0.070	dia	1/2"	1	1	1		
0.078	dia	1/2"	1	1	0		
0.079	dia	1/2"	4	2	2		
0.079	dia	1/2"	1	1	1	.004	Stubby (Contouring)
0.081	dia	1/2"	2	6	1		
0.086	dia	1/2"	2	6	0	.004	
0.089	dia	1/2"	2	3	1		
0.093	dia	1/2"	1	3	1		
0.094	dia	1/2"	3	2	1		
0.097	dia	1/2"	1	4	1		
0.101	dia	1/2"	2	1	3		
0.106	dia	1/2"	1	2	1		
0.109	dia	1/2"	1	2	1		
0.113	dia	1/2"	3	2	2		
0.116	dia	1/2"	2	1	2		
0.118	dia	1/2"	1	1	1		
0.120	dia	1/2"	2	2	2		
0.123	dia	1/2"	1	1	1		
0.125	dia	1/2"	2	5	3		
0.128	dia	1/2"	2	3	2	.004	
0.130	dia	1/2"	2	4	2	.010	
0.133	dia	1/2"	2	1	2		
0.136	dia	1/2"	2	1	2		
0.140	dia	1/2"	1	2	3		
0.142	dia	1/2"	2	3	2	.007	
0.145	dia	1/2"	1		2	.007	
0.149	dia	1/2"	2	2	1		
0.156	dia	1/2"	2	5	2		
0.158	dia	1/2"	1	2	3		
0.159	dia	1/2"	2	1	1		
0.161	dia	1/2"	2	0	1		
0.166	dia	1/2"	2	4	5	.000	
0.168	dia	1/2"	2	0	3		
0.169	dia	1/2"	1	1	1		
0.172	dia	1/2"	2	0	1		
0.176	dia	1/2"	2	2	1		
0.178	dia	1/2"	2	1	1		
0.182	dia	1/2"	1	1			
0.187	dia	1/2"	1	3	2		
0.189	dia	1/2"	2	2	2	.018, .025	
0.191	dia	1/2"	2	3	0		
0.195	dia	1/2"	1	3	1		
0.198	dia	1/2"	2	1	1		
0.201	dia	1/2"	1	2	2		
0.203	dia	1/2"	2	2	2		
0.208	dia	1/2"	1	1	1		
0.213	dia	1/2"	2	6	2		
0.215	dia	1/2"	2	2	1		
0.218	dia	1/2"	1	2	2		
0.223	dia	1/2"	1	1	1	.003	
0.228	dia	1/2"	1	1	1		
0.234	dia	1/2"	2	2	1		
0.237	dia	1/2"	2	2	2		
0.250	dia	1/2"	3	6	4	.025	
0.253	dia	1/2"	2	2	0	.000	
0.257	dia	1/2"	2	0	0		

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Punch Size	Station	Punch Size	Punch Qty	Die Clearances			Notes
				.006	.012	Other	
0.265	dia	1/2"	2	2	2		
0.271	dia	1/2"	1	1	1		
0.275	dia	1/2"	2	2	1		
0.281	dia	1/2"	2	2	2		
0.284	dia	1/2"	2	4	0		
0.290	dia	1/2"	1	1	1		
0.293	dia	1/2"	1	1	1		
0.296	dia	1/2"	1	2	1		
0.312	dia	1/2"	2	3	4		
0.323	dia	1/2"	1	1	1		
0.328	dia	1/2"	2	2	2		
0.343	dia	1/2"	2	2	2		
0.344	dia	1/2"	1	1	1		
0.347	dia	1/2"	1	2	1		
0.350	dia	1/2"	1	1	1	.004	
0.360	dia	1/2"	1	1	1		
0.368	dia	1/2"	1	1	1		
0.375	dia	1/2"	2	2	2		
0.380	dia	1/2"	2			0.010 (x2)	
0.390	dia	1/2"	1	1	1	.025	
0.394	dia	1/2"	1	1	1		
0.406	dia	1/2"	2	2	1		
0.414	dia	1/2"	2	2	2		
0.437	dia	1/2"	2	2	2		
0.445	dia	1/2"	2	3	1		
0.453	dia	1/2"	1	1	1		
0.468	dia	1/2"	1	1	1		
0.472	dia	1/2"	1	1			
0.484	dia	1/2"	1	1	1		
0.500	dia	1/2"	3	3	2	.018	
0.505	dia	1-1/4"	1	1	1	.003	
0.515	dia	1-1/4"	1	1	1	.025	
0.531	dia	1-1/4"	1	1	1		
0.540	dia	1-1/4"	1			.004	
0.547	dia	1-1/4"	1	1	1		
0.562	dia	1-1/4"	2	2	3		
0.576	dia	1-1/4"	1			.010	
0.594	dia	1-1/4"	1	1	1		
0.602	dia	1-1/4"	1	1	1		
0.625	dia	1-1/4"	1	1	1	.004	
0.635	dia	1-1/4"	1	1	1		
0.650	dia	1-1/4"	1	1	1		
0.666	dia	1-1/4"	1	1	1		
0.680	dia	1-1/4"	1	1	1		
0.687	dia	1-1/4"	1	1	1		
0.703	dia	1-1/4"	1	1	1		
0.720	dia	1-1/4"	1	1	1	.004	
0.734	dia	1-1/4"	1	1	1		
0.750	dia	1-1/4"	1	1	1	.004	
0.760	dia	1-1/4"	1	1	1	.009	
0.770	dia	1-1/4"	1	1	1		
0.773	dia	1-1/4"	1	1	1		
0.812	dia	1-1/4"	1	1	1		
0.843	dia	1-1/4"	1	1	1		
0.852	dia	1-1/4"	1	1	1		
0.859	dia	1-1/4"	1	1	1		

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Punch Size	Station	Punch Size	Punch Qty	Die Clearances			Notes
				.006	.012	Other	
0.870	dia	1-1/4"	1			.004	
0.875	dia	1-1/4"	1	1	1		
0.896	dia	1-1/4"	1			.004	Blanking tool
0.906	dia	1-1/4"	1	1	1		
0.920	dia	1-1/4"	1	1	1		
0.937	dia	1-1/4"	1	1	1		
0.960	dia	1-1/4"	1	1	1		
0.972	dia	1-1/4"	1	1	1		
0.984	dia	1-1/4"	1	1	1	.008	
0.992	dia	1-1/4"	1			.008	
1.000	dia	1-1/4"	2	1	2	.025	
1.023	dia	1-1/4"	1	1	1	.000	
1.032	dia	1-1/4"	2	1	1	.007	
1.043	dia	1-1/4"	1	1	1		
1.062	dia	1-1/4"	1	2	1		
1.068	dia	1-1/4"	1	1			
1.098	dia	1-1/4"	1	1	1		
1.125	dia	1-1/4"	1	1	1		
1.157	dia	1-1/4"	1		1		
1.187	dia	1-1/4"	1	1	1		
1.196	dia	1-1/4"	1			.004	Blanking tool
1.220	dia	1-1/4"	1	1	1		
1.250	dia	1-1/4"	2		0	0.025, .008	
1.260	dia	2"	1			.004	
1.312	dia	2"	1	1	1		
1.375	dia	2"	1	1	1		
1.406	dia	2"	1	1	1		
1.416	dia	2"	1	1			
1.472	dia	2"	1	1	1	.000	
1.500	dia	2"	2	2	1		
1.515	dia	2"	1			.004	
1.584	dia	2"	1			.008	
1.650	dia	2"	1	1	1		Blanking tool; use appropriate clearance
1.700	dia	2"	1	1	1		
1.720	dia	2"	1	1	1		
1.750	dia	2"	1	1	1		
1.762	dia	2"	1			.010	
1.800	dia	2"	1	1			
1.808	dia	2"	1		1		
1.834	dia	2"	1	1			
1.875	dia	2"	1	1	1		
1.937	dia	2"	1	1	1		
1.969	dia	2"	1	1	1		
2.000	dia	2"	1	1	1		
2.050	dia	3-1/2"	1	1		0.004, .018	
2.125	dia	3-1/2"	1	1	1		
2.225	dia	3-1/2"	1		1		
2.250	dia	3-1/2"	1	1	1	.004	
2.500	dia	3-1/2"	1	1	1		
2.813	dia	3-1/2"	1		1		
2.875	dia	3-1/2"	1			.018	
3.000	dia	4-1/2"	1	1	1		
3.143	dia	3-1/2"	1		1		
3.200	dia	3-1/2"	1			.010	

PUNCH TOOLING LIST

OBROUNDS

Feb 25, 2014

PJW

Punch Size	Station Size	Punch Qty	Die Clearances			Notes
			.006	.012	Other	
0.040 x 0.156	1/2"	1	2	1	.000	
0.050 x 0.375	1-1/4"	1	0		.010"	
0.062 x 0.187	1/2"	2	1	1		
0.062 x 0.250	1/2"	2	2	1		
0.062 x 0.300	1/2"	1	1	1		
0.062 x 0.325	1/2"	1	1	1		
0.062 x 0.400	1/2"	1	1	1		
0.062 x 0.500	1/2"	1	3	3		
0.062 x 0.625	1-1/4"	2	2	2		
0.062 x 1.125	1-1/4"	1	2	1	.004	
0.080 x 0.375	1/2"	2	2	2		
0.080 x 1.000	1-1/4"	1	2	1		
0.093 x 0.250	1/2"	1	1	2		
0.093 x 0.500	1/2"	1	1	1		
0.093 x 0.625	1-1/4"	1	1	1		
0.093 x 0.750	1-1/4"	1	1	1		
0.098 x 0.120	1/2"	1	1	1		
0.100 x 1.250	1-1/4"	1		1		
0.125 x 0.187	1/2"	3	2	2		
0.125 x 0.375	1/2"	2	3	3		
0.125 x 0.375	1-1/4"	2	3	1		
0.125 x 0.500	1/2"	2	3	2		
0.125 x 0.760	1-1/4"	1	1	1		
0.125 x 1.000	1-1/4"	2	4	2		
0.125 x 1.125	1-1/4"	1	0	1		
0.128 x 0.250	1/2"	2	2	1	.004	
0.128 x 0.390	1/2"	1	1	1		
0.130 x 0.205	1/2"	1	1	1		
0.130 x 0.220	1/2"	1	1	1	.004	
0.140 x 0.197	1/2"	1	1	1		
0.140 x 0.230	1/2"	1	1	1		
0.140 x 0.250	1/2"	1	1	1		
0.141 x 0.218	1/2"	1	1	1		
0.141 x 0.440	1/2"	2	2	1		
0.145 x 1.250	1-1/4"	1	1	1		
0.150 x 0.190	1/2"	1	1	1		
0.156 x 0.230	1/2"	2	2	1		
0.156 x 0.250	1-1/4"	1	1	1		
0.156 x 0.312	1-1/4"	1	1	1		
0.156 x 0.375	1/2"	1	1	1		
0.156 x 0.500	1/2"	1	1	1		
0.156 x 1.250	1-1/4"	1	1	1		
0.157 x 1.024	1-1/4"	1	1			
0.160 x 0.220	1-1/4"	1	1	1		
0.160 x 0.500	1/2"	1	1	1		
0.171 x 0.236	1/2"	1	1	1		
0.172 x 0.250	1-1/4"	1	1	1		
0.178 x 0.225	1/2"	1	1	1		
0.187 x 0.218	1/2"	1	1	1		
0.187 x 0.250	1/2"	1	2	2		
0.187 x 0.314	1/2"	1			.010"	
0.187 x 0.375	1-1/4"	2	1	1		
0.187 x 0.500	1/2"	2	2	2		
0.187 x 0.750	1-1/4"	1	1	1	.018	
0.187 x 1.000	1-1/4"	1	1	1		
0.187 x 1.250	1-1/4"	1	1	1		

PUNCH TOOLING LIST

OBROUNDS

Feb 25, 2014

PJW

Punch Size	Station Size	Punch Qty	Die Clearances			Notes
			.006	.012	Other	
0.188 x 1.188	1-1/4"	1			.021	
0.200 x 0.750	1-1/4"	1			.010	
0.209 x 0.394	1/2"	1			.008	
0.213 x 0.312	1/2"	1	1	1		
0.216 x 0.440	1/2"	1			.008	
0.218 x 0.250	1/2"	1	1	1		
0.218 x 0.500	1-1/4"	1	1	1		
0.250 x 0.500	1/2"	3	4	2		
0.250 x 0.625	1-1/4"	1	2	2		
0.250 x 1.250	1-1/4"	1	1	1		
0.255 x 0.380	1/2"	1	1	1		
0.265 x 1.440	2"	1			.008	
0.268 x 0.560	1-1/4"	1	1	1	.004	
0.281 x 0.406	1/2"	1	1	1		
0.281 x 0.500	1/2"	1	1	2		
0.281 x 0.931	1-1/4"	1	1	1		
0.312 x 0.500	1/2"	1	1	1		
0.312 x 0.625	1-1/4"	1	1	1		
0.330 x 0.750	1-1/4"	1	1	1		
0.343 x 0.500	1/2"	2	2	1		
0.375 x 0.625	1-1/4"	1	1	1		
0.400 x 0.950	1-1/4"	1	1	1		
0.406 x 0.484	1/2"	1			.009	Pre hit for CSK,OB.539x.461xOB.476x.398x90°FRMDN
0.406 x 1.000	1-1/4"	1	1	1		
0.416 x 0.494	1/2"	1			.009	Pre hit for CSK,OB.539x.461xOB.476x.398x90°FRMDN
0.474 x 1.000	1-1/4"	1			.009	
0.500 x 0.875	1-1/4"	1	1	1		
0.500 x 1.000	1-1/4"	2	1	0	.020	
0.500 x 1.250	2"	1	1	1		
0.600 x 1.750	2"	1	1		.020	
0.720 x 1.000	1-1/4"	1	1	1		
0.780 x 1.500	2"	2	1	1		

PUNCH TOOLING LIST

SQUARES

Feb 25, 2014

PJW

Die Clearances

Punch Size	Station Size	Punch Qty	@ 0°			@ 45°			Notes
			.006	.012	Other	.006	.012	Other	
0.060	1/2"	1	1	3	.004	2	2		
0.125	1/2"	2	2	2	.004		1		
0.145	1/2"	2	2	2		2	2		
0.156	1/2"	1		0					
0.165	1/2"	1	1						
0.187	1/2"	4	3	3	.004	1	1		
0.250	1/2"	3	4	2	.004	3	2	.018	
0.312	1-1/4"	2	2	1		1	1		
0.360	1-1/4"	1	2	1	.015	1	1		
0.375	1-1/4"	1	2	2	.004	1	1		
0.390	1-1/4"	2	1	3	.018				
0.394	1-1/4"	1	2	1					
0.437	1-1/4"	2	3	2					
0.472	1-1/4"	2	1	1		1	1		
0.500	1-1/4"	2	3	2	.004	2	2		
0.625	1-1/4"	2	3	1	.004	1	1		
0.750	1-1/4"	2	3	2			2		
0.750	2"	2	1	1				Keyed @ 0° and 45°	
1.000	2"	3	3	2	.008			Keyed @ 0° and 45°	
1.400	2"	1	1	1				Keyed @ 0° and 45°	
2.000	4-1/2"	2	1	1				Keyed @ 0° and 45°	

PUNCH TOOLING LIST

RECTANGLES

Feb 25, 2014

PJW

Punch Size	Station	Punch Size	Qty	Die Clearances			Notes
				.006	.012	Other	
0.040 x 0.312		1/2"	1	1			
0.040 x 0.500		1-1/4"	1	1		.004	
0.050 x 0.137		1/2"	1			.007	
0.050 x 0.500		1-1/4"	1			.010	
0.055 x 0.315		1/2"	2	2	1		
0.060 x 0.187		1/2"	2	5	1	.004	
0.062 x 0.500		1-1/4"	1	3	4	.004 (1x)	
0.062 x 0.750		1-1/4"	2	3	2		
0.070 x 0.700		1-1/4"	2	1	1		
0.079 x 0.158		1/2"	1	1	1		
0.080 x 0.375		1/2"	2	2	2		
0.080 x 0.740		1-1/4"	2	2	1	.004 (1x)	
0.093 x 0.500		1-1/4"	2	2	2		
0.093 x 1.083		1-1/4"	2	2	1	.004	
0.094 x 0.500		1-1/4"	2	3	2		
0.094 x 0.750		1-1/4"	3	2	2		
0.098 x 0.360		1/2"	2	1	1		
0.098 x 0.394		1/2"	2	2	1		
0.100 x 0.625		1-1/4"	3	3	2		
0.100 x 0.787		1-1/4"	2	2	1		
0.105 x 0.250		1/2"	1	1	1		
0.105 x 0.380		1/2"	1	1	1		
0.105 x 0.817		1-1/4"	1	2	1		
0.107 x 0.375		1/2"	1	0	1		
0.108 x 0.915		1-1/4"	2	2	2		
0.125 x 0.250		1/2"	1	2	1	.018	
0.125 x 0.280		1/2"	3	2	1		
0.125 x 0.375		1/2"	2	2	2		
0.125 x 0.450		1-1/4"	2	2	1		
0.125 x 0.500		1-1/4"	2	2	2	.010	
0.125 x 0.875		1-1/4"	2	3	2	.004, .018	
0.125 x 1.000		1-1/4"	2	3	2	.004, .008, .010	
0.143 x 0.380		1/2"	2	2	1		
0.156 x 0.250		1/2"	1	1	1		
0.156 x 0.500		1-1/4"	2	2	2	.004, .018	
0.158 x 0.847		1-1/4"	1	2	2		
0.166 x 1.956		2"	2	1		.004	
0.170 x 1.000		1-1/4"	1	2	1		
0.170 x 1.230		1-1/4"	3	3	2		
0.172 x 0.550		1-1/4"	1	1	1		
0.175 x 0.500		1-1/4"	1	1	1		
0.175 x 3.000		3-1/2"	1	1	1		
0.187 x 0.500		1-1/4"	1	2	1	.018	
0.187 x 1.000		1-1/4"	1	1	2	.000	
0.200 x 0.350		1-1/4"	1	1	1	.004, .018	
0.200 x 0.500		1-1/4"	1	1	1		
0.200 x 1.000		1-1/4"	1	0	2		
0.210 x 0.750		1-1/4"	2	1	1	.004	
0.218 x 1.000		1-1/4"	1	1	1		
0.237 x 0.750		1-1/4"	3	1	1		
0.250 x 0.375		1/2"	3	3	2	.018 (2x)	
0.250 x 0.500		1-1/4"	2	2	1	.004 (3x), .008 (1x)	
0.250 x 0.625		1-1/4"	2	2	2		
0.250 x 1.000		1-1/4"	2	2	3	.004 (3x), .008, .018 (2x), .025, .030 (1x)	
0.250 x 1.950		2"	2	3	1	.020, .030	

PUNCH TOOLING LIST

RECTANGLES

Feb 25, 2014

PJW

Punch Size	Station Size	Punch Qty	Die Clearances			Notes
			.006	.012	Other	
0.250 x 2.500	3-1/2"	4	2	1	.004, .010, .018	
0.250 x 3.000	3-1/2"	2	2	5	.004, .010, .018	
0.250 x 4.000	4-1/2"	2	2	3	.010	Relieved stripper plate available
0.258 x 0.280	1/2"	1	1	1		
0.258 x 0.288	1/2"	1	1			
0.281 x 0.562	1-1/4"	1	1	1		
0.287 x 0.587	1-1/4"	1	1		.009	
0.289 x 0.620	1-1/4"	1		1		
0.300 x 1.550	2"	1			.004 (1x)	
0.300 x 3.500	4-1/2"	1	1	1		
0.312 x 0.500	1-1/4"	2	2	1		
0.335 x 0.850	1-1/4"	2		1		
0.375 x 0.800	1-1/4"	2	2	2		
0.375 x 1.000	1-1/4"	3	3	2		
0.400 x 2.500	3-1/2"	1	1	1		
0.450 x 0.600	1-1/4"	2	2	1		
0.488 x 0.650	1-1/4"	1	1	1		
0.490 x 0.645	1-1/4"	1	1	1		
0.492 x 0.692	1-1/4"	1			.008	Blanking tool
0.500 x 1.000	1-1/4"	1	2	1	.024	
0.500 x 1.250	2"	1			.024	
0.500 x 1.625	2"	0	1	1		
0.500 x 2.000	3-1/2"	1	0	1	.004	
0.520 x 0.611	1-1/4"	1	1	1		
0.525 x 0.645	1-1/4"	1	1	1		
0.528 x 0.625	1-1/4"	1	2	2		
0.535 x 0.645	1-1/4"	1			.008	
0.540 x 0.576	1-1/4"	2	1	1		
0.550 x 0.610	1-1/4"	1	1	1		
0.590 x 2.000	3-1/2"	1	1	1		
0.595 x 2.287	3-1/2"	1			.005	Blanking tool; .043 copper
0.625 x 1.250	2"	1	1	1		
0.750 x 1.000	1-1/4"	1	1	1	.004	
0.796 x 3.402					.004 (1x)	
0.921 x 1.621	2"	1			.004	Blanking tool
0.968 x 1.696	2"	1			.004	Blanking tool
0.976 x 1.696	2"	1			.004	
1.030 x 1.080	2"	1	1	1		
1.085 x 1.245	2"	1	0			
1.100 x 1.125	2"	1			.024	
1.146 x 1.887	3-1/2"	1			.000	

PUNCH TOOLING LIST*Rounded C*

Feb 25, 2014

Punch Size	Station Size	Punch Qty	Die Clearances		Notes	PJW
			.012	Other		
0.157 x 0.157	½"	1	1		.039 rad corners	
0.181 x 0.187	½"	0	1	.006	.054 rad corners	No punch body or stripper
0.242 x 0.532	1-1/4"	1		.008	.030 rad corners	
0.300 x 1.550	2"	1		.004	.031 rad corners	
0.330 x 0.835	1-1/4"	1	1		.030 rad corners	
0.350 x 0.450	1-1/4"	1	1		.031 rad corners	
0.400 x 0.517	1-1/4"	1	1		.062 rad corners	
0.400 x 1.580	2"	1	1		.060 rad corners	
0.420 x 0.800	1-1/4"	1	1		.060 rad corners	
0.597 x 1.697	3-1/2"	1		.003	Blanking tool; .219 rad corners	
0.609 x 0.734	1-1/4"	1	1		.089 rad corners	
0.796 x 3.402	3-1/2"	1		.004	.004 rad corners, Blanking tool	
1.085 x 1.245	2"	1		.006	.090 rad corners	
1.250 x 2.500	3-1/2"	1	1	.014	.250 rad corners	
1.500 x 1.500	4-1/2"	1		.006	Keyed @ 0° and 45° .250 rad corners	

PUNCH TOOLING LIST

COUNTER-SINKS

Feb 25, 2014

PJW

Diameter	Angle	Pilot Size	Type	Material	Approximate Pre-Punch	Notes
.161	x 82°	.098	Form Down	.036		
.165	x 82°	.117	Form Up	.048	.125	
.170	x 82°	.089	Form Down	.080		
.172	x 82°	.094	Form Down	.050		
.177	x 100°	.100	Form Down	.100	.119	
.178	x 82°		Form Up		.136	No pilot
.185	x 82°	.099	Form Down	.090		
.185	x 100°	.106	Form Down	.100		
.185	x 120°	.098	Form Down	.080	.128	
.190	x 90°	.097	Form Up	.080	.125	
.190	x 90°	.097	Form Down	.080	.128	
.190	x 90°	.125	Form Down	.040	.128	(Ø.140 pre hit per operator)
.190	x 100°	.098	Form Down	.048	.128	
.197	x 82°	.145	Form Down	.030		
.201	x 82°	.125	Form Down	.048	.156	
.210	x 100°	.134	Form Down	.032		
.210	x 120°	.098	Form Down	.063		
.213	x 90°	.125	Form Down	.048		
.218	x 82°	.125	Form Down	.063		
.225	x 82°	.125	Form Down	.063		
.225	x 82°	.156	Form Down	.040	.176	
.230	x 90°	.128	Form Down	.090	.156	
.230	x 82°	.144	Form Down	.050	.166	
.230	x 100°	.128	Form Down	.080	.156	
.231	x 100°	.133	Form Down	.040	.157	
.232	x 120°	.122	Form Down	.036	.149	Qty of 2 available
.232	x 120°	.142	Form Down	.030	.165	
.235	x 82°	.135	Form Down	.060		
.235	x 82°	.150	Form Down	.063		
.235	x 100°	.125	Form Down	.063	.152	alum
.238	x 100°	.133	Form Up	.048		
.240	x 82°	.140	Form Down	.080	.165	
.240	x 82°	.140	Form Down	.063	.172	
.240	x 90°	.128	Form Down	.075	.156	
.240	x 90°	.128	Form Down	.125	.156	
.245	x 100°	.141	Form Down	.050	.167	
.246	x 100°	.156	Form Down	.062	.187	
.248	x 90°	.160	Form Down	.048	.176	(Ø pre hit per operator)
.248	x 90°	.160	Form Up	.048	.176	
.250	x 82°	.144	Form Down	.063		
.250	x 90°	.185	Form Down	.048	.	
.250	x 120°	.136	Form Up	.048		
.250	x 120°	.136	Form Down	.048	.164	
.252	x 100°	.157	Form Down	.040	.187	(Ø.178 pre hit per N.S.)
.252	x 100°	.134	Form Down	.060	.161	
.252	x 100°	.134	Form Up	.080	.165	
.255	x 82°	.128	Form Down	.090		
.258	x 90°	.134	Form Down	.074	.163	
.259	x 82°	.156	Form Up	.080	.182	
.260	x 82°	.141	Form Down	.080		
.270	x 120°	.220	Form Down	.048	.250	
.270	x 82°	.141	Form Down	.040		No pilot
.274	x 90°	.156	Form Up	.063	.186	
.279	x 82°	.150	Form Down	.080		
.280	x 82°	.175	Form Down	.062	.195	

PUNCH TOOLING LIST

COUNTER-SINKS

Feb 25, 2014

Diameter	Angle	Pilot Size	Type	Material	Approximate	Notes
					Pre-Punch	
.282	x 100°	.186	Form Up	.063	.210	
.285	x 100°	.175	Form Up	.100	.203	
.286	x 100°	.156	Form Down	.062	.172	
.289	x 82°	.156	Form Down	.125	.189	
.290	x 82°	.156	Form Down	.100	.195	
.290	x 100°	.162	Form Down	.080		
.295	x 90°	.170	Form Down	.063		
.300	x 82°	.175	Form Down	.125	.195	
.301	x 90°	.217	Form Down	.080		
.307	x 82°		Form Down	.100, .125		No pilot
.307	x 82°	.156	Form Down	.125	.195	
.308	x 82°	.205	Form Down	.063	.223	
.310	x 82°	.161	Form Down	.090	.198	Qty of 2 available
.312	x 82°	.163	Form Down	.090	.200	
.315	x 90°	.173	Form Down	.125		
.320	x 82°	.181	Form Down	.080		
.320	x 82°	.212	Form Down	.063		
.323	x 90°	.171	Form Down	.080	.208	
.323	x 90°	.197	Form Down	.063	.229	
.328	x 90°	.176	Form Down	.080	.214	
.329	x 82°	.164	Form Down	.125		
.330	x 100°		Form Up	.032		Embossed
.330	x 100°	.172	Form Down	.080	.211	
.337	x 82°	.181	Form Down	.090		
.342	x 82°	.219	Form Down	.074		
.342	x 82°	.189	Form Down	.104		
.342	x 90°	.182	Form Down	.090		
.344	x 82°	.187	Form Down	.090		
.350	x 100°	.177	Form Down	.100		
.355	x 82°	.192	Form Down	.125		
.356	x 90°	.134	Form Down	.119	.190	(Ø.189 pre hit per N.S.)
.360	x 82°	.257	Form Down	.063		
.370	x 90°	.177	Form Down	.119		Ø.225 per calculation
.370	x 90°	.252	Form Down	.063	.282	
.375	x 100°	.188	Form Up	.100		(Ø.385 on dwg)
.386	x 120°	.260	Form Up	.063		
.388	x 100°	.219	Form Down	.074	.253	
.390	x 82°	.234	Form Down	.090		
.391	x 100°	.201	Form Down	.119		
.410	x 90°	.262	Form Down	.074	.299	
.409	x 90°	.250	Form Down	.080		
.455	x 100°	no pilot	Form Down	.100		No pilot
.461	x 90°	.395	Form Down	.060	.409	
.470	x 120°	.195	Form Down	.090	.228	
.539	x 90°	.289	Form Down	.125	.352	
OB.539x.460	x 90°	OB.476x.398	Form Down	0.06	OB .416x.494	

PUNCH TOOLING LIST

SHAPES

Feb 25, 2014

Type	Punch Size	Station Size	Punch Qty	Die Clearances			Notes
				.006	.012	Other	
Star Radius	.062 rad, .250 web	1-1/4"	2	3	3		.500 x .500 w/.125 offset
Star Radius	.079 rad, .250 web	1-1/4"	1	1	1		.534 x .534 w/.125 offset
Star Radius	.094 rad, .250 web	1-1/4"	1	1	1		.625 x .625 w/.125 offset
Star Radius	.125 rad, .250 web	1-1/4"	2	2	1	.004	.625 x .625 w/.125 offset
Star Radius	.140 rad, .250 web	1-1/4"	2	2	2		.530 x .530 w/.125 offset
Star Radius	.187 rad, .250 web	1-1/4"	2	2	2		.750 x .750 w/.125 offset
Star Radius	.250 rad, .250 web	1-1/4"	2	3	2		.875 x .875 w/.125 offset
Star Radius	.313 rad, .250 web	1-1/4"	1		1		1.000 x 1.000 w/.125 offset
Star Radius	.375 rad, .250 web	1-1/4"	1	1	1		1.125 x 1.125 w/.125 offset
Star Radius	.500 rad, .250 web	1-1/4"	1	1	1		1.250 x 1.250 w/.125 offset
Curved Rect	.062 in-rad x .100 thk	1/2"	1			.009	90° arc, .163 x .163
Curved Rect	.062 in-rad x .125 thk	1-1/4"	1	1	1		90° arc, .187 x .187
Curved Rect	.125 in-rad x .125 thk	1-1/4"	1			.010	180° arc, .250 x .500
Curved Rect	.180 in-rad x .080 thk	1-1/4"	1	1			90° arc, .133 x .367
Curved Rect	.187 in-rad x .125 thk	1-1/4"	1			.010	90° arc, .312 x .312
Curved Rect	.225 in-rad x .080 thk	1-1/4"	1			.010	90° arc, .305 x .305
Curved Rect	.250 in-rad x .125 thk	1-1/4"	1		1		45° arc, .287 x .144
Curved Rect	.250 in-rad x .125 thk	1-1/4"	1	1	1		90° arc, .375 x .375
Curved Rect	.250 in-rad x .250 thk	1-1/4"	1		1		68° arc, .497 x .599
Curved Rect	.312 in-rad x .125 thk	1-1/4"	1			.005	46° arc, .150 x .341
Curved Rect	.325 in-rad x .125 thk	1-1/4"	1			.008	46° arc, .151 x .352
Curved Rect	.375 in-rad x .125 thk	1-1/4"	1			.010	90° arc, .500 x .500
Curved Rect	.438 in-rad x .125 thk	1-1/4"	1			.005	46° arc, .158 x .436
Curved Rect	1.563 in-rad x .250 thk	1-1/4"	1			.010	31° arc
Curved Rect	1.625 in-rad x .250 thk	1-1/4"	1			.008	31° arc
Single-D	.237 flat x .252 dia	1/2"	1	1	1		Keyed: flat to operator, flat to left
Single-D	.289 flat x .328 dia	1/2"	1	1			Keyed: flat to operator, flat to left
Single-D	.292 flat x .316 dia	1/2"	1	1	1		Keyed: flat to operator, flat to left
Single-D	.298 flat x .328 dia	1/2"	1	1			Keyed: flat to operator, flat to left
Single-D	.350 flat x .378 dia	1-1/4"	1	1	1		Keyed: flat to operator, flat to left
Single-D	.350 flat x .385 dia	1/2"	1	1			Keyed: flat to operator, flat to left
Single-D	.363 flat x .385 dia	1-1/4"	1	1	1		Keyed: flat to operator, flat to left
Single-D	.412 flat x .437 dia	1-1/4"	1	1	1		Keyed: flat to operator, flat to left
Single-D	.426 flat x .446 dia	1-1/4"	1	1	1		Keyed: flat to operator, flat to left
Single-D	.471 flat x .506 dia	1-1/4"	1	1	1		Keyed: flat to operator, flat to left
Single-D	.473 flat x .505 dia	1/2"	1	1	1		Keyed: flat to operator, flat to left
Single-D	.480 flat x .510 dia	1-1/4"	1	1	1		Keyed: flat to operator, flat to left
Single-D	.555 flat x .625 dia	1-1/4"	1	1			Keyed: flat to operator, flat to left
Single-D	.575 flat x .630 dia	1-1/4"	1	1	1		Keyed: flat to operator, flat to left
Single-D	.656 flat x .713 dia	1-1/4"	1	1			Keyed: flat to operator, flat to left
Single-D	.950 flat x 1.012 dia	1-1/4"			1	.008	Keyed : flat to operator
Double-D	.130 flat x .232 dia	1/2"	1	1	1		Keyed: flat to operator, flat to left
Double-D	.203 flat x .265 dia	1/2"	1	1	1		Keyed: flat to operator, flat to left
Double-D	.211 flat x .257 dia	1/2"	1	1	1	.008, .010	Keyed: flat to operator, flat to left
Double-D	.245 flat x .325 dia	1/2"	1	1			Keyed: flat to operator, flat to left
Double-D	.290 flat x .405 dia	1/2"	1	1	1		Keyed: flat to operator, flat to left
Double-D	.312 flat x .375 dia	1/2"	1	1		.010	Keyed: flat to operator, flat to left
Double-D	.316 flat x .390 dia	1/2"	1		1		Keyed: flat to operator, flat to left
Double-D	.415 flat x .475 dia	1/2"	1	1	1		Keyed: flat to operator, flat to left
Double-D	.440 flat x .500 dia	1-1/4"	1	1	1		Keyed: flat to operator, flat to left
Double-D	.461 flat x .562 dia	1-1/4"	1			.010	Keyed: flat to operator, flat to left
Double-D	.465 flat x .500 dia	1/2"	1	1	1		Keyed: flat to operator, flat to left
Double-D	.570 flat x .625 dia	1-1/4"	1	1	1		Keyed: flat to operator, flat to left
Double-D	.615 flat x .755 dia	1-1/4"	1			.010	Keyed: flat to operator, flat to left
Double-D	.625 flat x .740 dia	1-1/4"	1	1	1		Keyed: flat to operator, flat to left
Double-D	.645 flat x .755 dia	1-1/4"	1	1	1		Keyed: flat to operator, flat to left (mailbox lock)
Double-D	.660 flat x .780 dia	1-1/4"	1	1			Keyed: flat to operator, flat to left
Double-D	.753 flat x .803 dia	1-1/4"	1			.010	Keyed : flat to operator
Double-D	1.125 flat x 1.340 dia	2"	1	1	1		Keyed: flat to operator, flat to left
Trapezoid	.250 x 1.220, 30° ang	1-1/4"	1	1	1		Keyed: 4 ways
Trapezoid	.390 x .768, .100 rad	1-1/4"	1	1	1		Keyed: 4 ways
Trapezoid	.450 x .810, .132 rad	1-1/4"	1	2	2		Keyed: short side to operator and to left (std DB-9)
Trapezoid	.450 x 1.67, .132 rad	2"	1	1	1		Keyed: 4 ways (std DB-25)

PJW

PUNCH TOOLING LIST**SHAPES**

Feb 25, 2014

Type	Punch Size	Station Size	Punch Qty	Die Clearances			Notes
				.006	.012	Other	
Hex	.238 x .275	1/2"	1	1		0.007	238 flat to flat
Hex	.378 x .437	1/2"	1	1	1		.378 flat to flat
Hex	.470 x .540	1-1/4"	1			.016	.470 flat to flat
Hex	.504 X .582	1-1/4"	1	1	1		.504 flat to flat

PJW

PUNCH TOOLING LIST

SPECIALS

Feb 25, 2014

PJW

Type	Punch Size	Station Size	Specs & Notes
Blanking	.450 x 1.176	2"	Die clear.: .011, tool no.: 928644
Blanking	.450 x 1.740	2"	Die clear.: .009, tool no.: 849479
Blanking	.470 x 1.988		Die clear.: .012, tool no.: 911577
Blanking	.500 x .625	1-1/4"	Die clear.: .006 [DTI Rack hole] WT2130669
Blanking	.605 x 2.210	1-1/4"	Die clear.: .015, tool no.: 912850
Blanking	.625 x 1.931	2"	.125 x 45° chamfered corners
Blanking	1.392 x .866	2"	Die clear.: .005, Tool No. WT1124614-20
Blanking	1.575 x 2.237	3-1/2"	.125 x 45° chamfered corners
Card Guide	.216 flat x 1.050 oml, .127 high	3-1/2"	WT510614-20,form UP, mat'l = .048
Card Guide	.216 flat x 2.000 oml, .127 high	3-1/2"	WT510614-10,form UP, mat'l = .048,
Card Guide	.070 flat x 3.000 oml, .100 high	3-1/2"	WT2121336, form UP,mat'l .038, .070 slot, .100 high
Emboss	.300 flat x .469 oml x .110 high	1-1/4"	WT2408389, form UP, mat'l: .017, pre-punch=.114, ANGLED
Emboss	.300 flat x .510 oml x .090 high	1-1/4"	WT2159765, form UP, mat'l: .017, pre-punch=.130, ANGLED
Emboss	.347 flat x .250 hi	1-1/4"	WT2071645, form UP, mat'l=.080
Emboss	.350 flat x .670 oml x .150 high	1-1/4"	WT837622, form down
Emboss	.400 flat x .580 oml x .125 high	1-1/4"	WT2071639, form UP, mat'l=.063
Emboss	.410 flat x .760 oml x .130 high	1-1/4"	WT2128607, form UP, mat'l=.063
Emboss	.750 flat x .063 hi	1-1/4"	WT2071643, form UP, mat'l=.090
Emboss w/Form	1.375 flat x .050hi,.812 flat x .130 hi	2"	WT2129535, form UP, w/form, Ø .238 pre punch= Ø .265 thru
Extrusion	.089 dia		WT893654, approx. pre-punch: .062
Extrusion	0.109 I.D. , .100 high overall	1-1/4"	WT699033-30, approx. pre-punch : 0.059, mat'l=.048 galvnzcd
Extrusion	0.124 I.D. , .126 high overall	1-1/4"	WT406739-10,approx. Pre-punch:0.065, mat'l= .063 alum
Extrusion	.159 dia		WT937322, adjust pre-punch for desired height
Extrusion	.800 I.D., .500 high overall	1-1/4"	Amada Mfg PN: SP000412-06897, pre punch .653 , 080 Alum
Lance & Form	.060 x .500 x .080 high	1-1/4"	WT2013479, designed for .048 crs
Lance & Form	.150 x .495 x .108 high	1-1/4"	WT2127477, designed for .100 alum
Lance & Form	.175 x .495 x .108 high	1-1/4"	WT2062470 designed for .030 alum
Lance & Form	.125 x .660 x .150 high	1-1/4"	Amada tooling, form UP, designed for .063 alum # S114403-01301
Lance & Form	.125 x .821 x .170 high	1-1/4"	Amada tooling, form UP, designed for .075 alum # S114403-01383
Lance & Form	.250 x .750 x .143 high	1-1/4"	WT517018-10,form UP, designed for .062 AL,, .080 opening
Lance & Form	.360 X .360 TOP FLAT,.172 high	1-1/4"	WT585907-10, form UP, designed for .036 galv.,
Louver	.243 x 1.860 x .188 high w/.243 rad corners (2x)	3-1/2"	Form UP; .197 offset from flat TL#S300801-0083
Louver	.259 x 1.175 x .121 high w/.259 rad corners (2x)	2"	Form UP; .130 offset from flat TL#S300606-0116
Louver	.327 x .548 x .095 high Thumbnail louver	1-1/4"	Form UP. .163 off set from flat Amada # A3024120147 designed for .075 crs 4-WAY KEY
Louver	.550 x .610 x .180 high w/.100 rad corners (2x)	1-1/4"	Form UP, .325 offset from flat WT2071654
Louver	.590 x 3.150 x .256 high w/.590 rad corners (2x)	3-1/2"	Form UP, .185 offset from flat; Loads 4 ways. (SPACING .750 END TO END) TL#0300-772, punch is relieved on flat side. (1.00 FLAT FACE TO FLAT FACE)
Louver	.640 x .650 x .110 high*****	1-1/4"	WT2120124, form UP, .275 offset from flat
Perforator	.078 dia rounds .250 x .216 centers	2"	16-hole rectangular. Die clear.: .010
Perforator	.094 dia rounds .216 centers	1-1/4"	3-hole in-line. Die clear.: .006
Perforator	.094 dia rounds .216 centers	1-1/4"	4-hole in-line Die clear.: .006
Perforator	.094 dia rounds .250 x .216 centers	2"	12-hole rectangular Die clear.: .006
Perforator	.094 dia rounds .250 x .216 centers	2"	16-hole rectangular Die clear.: .006
Perforator	.120 dia rounds .400 x .400 centers	2"	6-hole rectangular Die clear.: .010 S502608-0254
Perforator	.120 dia rounds .400 x .400 centers	3.5"	16-hole square Die clear.: .010 S503801-0306
Perforator	.135 dia rounds .320 x .187 centers	2"	12-hole staggered Die clear.: .006

PUNCH TOOLING LIST

SPECIALS

Feb 25, 2014

PJW

Type	Punch Size	Station Size	Specs & Notes
Perforator	.149 dia rounds .374 x .324 centers	1-1/4"	6-hole rectangular Die clear.: .006, .012
Perforator	.156 dia rounds .216 x .187 centers	1-1/4"	12-hole staggered Die clear.: .006, .012
Perforator	.187 dia rounds .500 x .433 centers	2"	12-hole rectangular Die clear.: .006, .010
Perforator	.145 squares .450 centers	1-1/4"	3-hole in-line Die clear.: .005
Perforator	.060 x .187 rectangle .250 centers	1-1/4"	4-hole staggered Die clear.: A52041001404 (Material .048 crs)
Perforator	.125 x .375 obrounds .500 x .450 centers	2"	9-hole rectangular Die clear.: .004, .006, .010, .012
1/2-Shear	.104 x .125	1-1/4"	Rectangle w/ full rad one end only.
1/2-Shear	.090 dia.	1-1/4"	Form Up, .125 material (** no guarantee) Amada # S203435-0799
1/2-Shear	.125 dia	1-1/4"	Form UP; nominal mat'l = .060m, .125 material max. WT2160004
1/2 Shear	.180 dia	1-1/4"	Form Up: .125 material max. WT SO: 745550-20
1/2 Shear	.250 dia		Form Up: .125 material (Amada # SP203435-06534)
1/2 Shear	.426 dia		Form Up: .125 material (Amada # SP203435-06535)
Rack Tab	.463 x .495 x .193 high	1-1/4"	Form UP. DTI tool. WT # 377422-10, Originally ordered for .075 M.S.
Wilson Wheel	.125rad rib wheel	1-1/4"	Form UP; max.mat'l=.080 alum; min.dist.from X0=4"
Wilson Wheel	.080 offset tool	1-1/4"	Mat'l: .080 alum.
Hinge Tool Set (2 tools)	.125 dia pin opening .500 knuckles	1-1/4"	For .063 alum & steel
NCT3-Tap	tapping tool with 4 pitch inserts	2"	Current taps: (4-40, 2-56) (6-32, 8-32, 10-32) (M3x.5(use 0.5 insert)) (M4x0.7(use 0.7 insert))
Inverted diamond	.250 x .394	0.5	3 punches Die clear.: .006, .012
Dimple	.120 dia, Form Down	0.5"	Form Down .035 deep WT2152908
Dimple	.125 dia, Form UP	1-1/4"	238829-40
Contour Tool	.079 dia.	0.5"	.090" material max. per Amada
LCD IN	.506 x .417	1-1/4"	Custom "T" shaped cutout WT SO: 1118962-20"
DC IN/DC OUT	.972 x .716	1-1/4"	Custom shape, WT SO: 1118962-10

PART MARK AND CHARACTER INVENTORY

Feb 25, 2014

AMADA .520 X 1.65 FORM UP "C" STATION PUNCH AND DIE W/ 2 ROWS OF 13 CHARACTERS

AMADA .520 X 1.65 FORM DOWN "C" STATION PUNCH AND DIE W/ 2 ROWS OF 13 CHARACTERS

CHARACTER	SIZE	QTY
0	.125"	11
1	.125"	6
2	.125"	10
3	.125"	6
4	.125"	11
5	.125"	6
6	.125"	5
7	.125"	8
8	.125"	5
9	.125"	5
A	.125"	3
B	.125"	4
C	.125"	3
D	.125"	2
E	.125"	4
F	.125"	2
G	.125"	0
H	.125"	1
I	.125"	1
J	.125"	0
K	.125"	1
L	.125"	1
M	.125"	0

CHARACTER	SIZE	QTY
N	.125"	1
O	.125"	0
P	.125"	1
Q	.125"	0
R	.125"	4
S	.125"	0
T	.125"	1
U	.125"	0
V	.125"	3
W	.125"	1
X	.125"	0
Y	.125"	0
Z	.125"	0
\	.125"	0
/	.125"	1
-	.125"	7
BLANK SPACE	.125"	28
BLANK ROW	.125"	2

PUNCH TOOLING LIST

MARKING

Type	Character Size	Station Size	Specs & Notes
"1"	.188"	1/2"	Amada- Form Down Marking Tool
"2"	.188"	1/2"	Amada -Form Down Marking Tool
"Rx"	.188"	1/2"	Amada- Form Down Marking Tool
"Tx"	.188"	1/2"	Amada -Form Down Marking Tool
"Λ"	0.114	1/2"	WT SO:1008990-10 ARROW F/D 60 DEG SHISEL POINT .015 DEEP STAMP
"572-2659-00A"	.091"	1-1/4"	WT SO:1124614-10 FORM DOWN CUSTOM STAMP
.187-LINE	.187"	1/2"	
.750-LINE	.75"	1-1/4"	
Ground Symbol		1-1/4"	

JOGGLE BEND DATA

Feb 25, 2014

PJW

Format: Material/Joggle=Amount to add to flat size

Codes: A=Aluminum

S= Mild Steel

SS=Stainless Steel

L=Lazy joggle

T=Tight (90 deg)

Aluminum	Mild Steel	Stainless Steel
.025A/.060T=.033	.010S/.035T=.022	.010SS/.047L=.017
.032A/.093T=.047	.018S/.060T=.024	.010SS/.067L=.032
.032A/.110T=.070	.024S/.025L=.005	.010SS/.075L=.040
.032A/.155T=.116	.024S/.036L=.014	.010SS/.085T=.075
.032A/.160T=.119	.024S/.044L=.015	.010SS/.090T=.080
.032A/.165T=.122	.024S/.056L=.019	.010SS/.094T=.069
.040A/.040L=.007	.024S/.075L=.022	.010SS/.100T=.070
.040A/.060L=.020	.024S/.154T=.119	.010SS/.104T=.094
.040A/.079T=.027	.030S/.050L=.010	.010SS/.110L=.070
.040A/.096L=.030	.030S/.066T=.026	.010SS/.115T=.105
.040A/.118T=.058	.030S/.070T=.040	.010SS/.120T=.110
.040A/.124T=.080	.030S/.080T=.060	.010SS/.125L=.095
.040A/.160T=.114	.030S/.125T=.088	.010SS/.140T=* (*Use reg. Bend) RAD .008, BD = .017
.040A/.250T=.196	.036S/.025L=.007	.010SS/.168T=.136
.050A/.050T=.020	.036S/.036L=.010	.012SS/.051L=.025
.050A/.060L=.011	.036S/.044T=.017	.015SS/.040T=.020
.050A/.060L=.015	.036S/.050L=.010	.015SS/.093T=.068
.050A/.082T=.031	.036S/.059T=.022	.015SS/.098L=.040
.050A/.125T=.066	.036S/.063L=.016	.018SS/.060L=.031
.050A/.150T=.085	.036S/.067T=.035	.020SS/.040L=.015
.050A/.150T=.090	.036S/.080T=.045	.020SS/.040T=.025
.050A/.179T=.123	.036S/.090L=.027	.020SS/.100T=.065
.050A/.231T=.187	.036S/.100T=.055	.020SS/.110T=.081
.050A/.250T=.187	.036S/.106T=.053	.020SS/.120L=.040
.063A/.030L=.008	.036S/.110T=.065	.020SS/.125T=.100
.063A/.062L=.008	.036S/.125T=.080	.024SS/.098T=.069
.063A/.062T=.016	.036S/.130T=.095	.024SS/.100L=.030
.063A/.067L=.020	.036S/.136L=.055	.030SS/.106T=.059
.063A/.070T=.020	.036S/.136T=.095	.030SS/.141T=.090
.063A/.071L=.015	.036S/.150T=.110	.036SS/.035L=.008
.063A/.075L=.017	.036S/.151L=.064	.036SS/.060L=.015
.063A/.080T=.026	.036S/.194T=.154	.036SS/.074T=.035
.063A/.083L=.023	.036S/.211T=.155	.036SS/.080L=.030
.063A/.087L=.027	.036S/.220T=.160	.036SS/.080T=.045
.063A/.100T=.038	.036S/.224T=.164	.036SS/.100T=.055
.063A/.107T=.047	.036S/.250T=.210	.036SS/.110T=.050
.063A/.114T=.055	.039S/.161T=.118	.036SS/.117T=.053
.063A/.122T=.044	.039S/.190T=.134	.036SS/.127T=.083
.063A/.125T=.061	.039S/.229T=.180	.048SS/.048L=.015
.063A/.133T=.071	.042S/.039L=.007	.048SS/.102T=.047
.063A/.140L=.040	.042S/.060T=.026	.048SS/.173T=.105
.063A/.145T=.081	.042S/.067L=.012	.075SS/.075L=.015
.063A/.150L=.045	.042S/.079L=.017	.075SS/.110L=.022
.063A/.160T=.095	.042S/.157T=.100	.075SS/.175T=.090
.063A/.162L=.050	.042S/.188T=.134	.075SS/.240L=.128
.063A/.173L=.088	.048S/.050L=.012	.075SS/.270T=.170
.063A/.180T=.105	.048S/.060L=.013	.090SS/.138L=.040
.063A/.189T=.112	.048S/.077T=.030	.090SS/.160L=.022
.063A/.193L=.120	.048S/.085T=.050	.104SS/.109L=.030
.063A/.196T=.118	.048S/.096T=.054	.120SS/.182L=.040
.063A/.230T=.158	.048S/.100L=.018	
.063A/.250T=.172	.048S/.115L=.020	
.063A/.356T=.265	.048S/.118T=.075	
.080A/.080L=.020	.048S/.132T=.075	
.080A/.080T=.008	.048S/.150T=.085	
.080A/.100T=.031	.048S/.150T=.091	
.080A/.140T=.075	.048S/.160T=.096	
.080A/.150L=.042	.048S/.168T=.104	
.080A/.165L=.081	.048S/.200T=.130	
.080A/.180T=.095	.048S/.214T=.160	
.080A/.205T=.120	.048S/.238T=.193	
.080A/.220T=.144	.060S/.062L=.007	
.090A/.058L=.006	.060S/.075L=.010	
.090A/.073L=.010	.060S/.077L=.024	
.090A/.090L=.020	.060S/.090T=.031	
.090A/.090T=.027	.060S/.098T=.029	
.090A/.110L=.025	.060S/.099L=.024	
.090A/.125L=.030	.060S/.100T=.037	
.090A/.150L=.050	.060S/.118T=.070	
.090A/.170L=.064	.060S/.125T=.051	
.090A/.187T=.090	.060S/.134T=.064	
.090A/.243L=.133	.060S/.136L=.056	
.100A/.115L=.025	.060S/.138T=.080	
.100A/.311T=.269	.060S/.156T=.092	
.125A/.125L=.045	.060S/.188T=.117	
.125A/.345L=.176	.060S/.195L=.055	
.125A/.329T=.174	.060S/.213T=.150	
	.060S/.225T=.145	
	.060S/.250T=.190	

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Feb 25, 2014

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Codes: A=Aluminum

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S= Mild Steel

T=Tight (90 deg)

SS=Stainless Steel

PJW

Aluminum	Mild Steel	Stainless Steel
	.075S/.075L=.017	
	.075S/.085L=.020	
	.075S/.095T=.022	
	.075S/.098L=.025 3/16" joggle tool, American Di-Acro	
	.075S/.125L=.051 3/16" joggle tool	
	.075S/.135L=.050 1/4" joggle tool	
	.075S/.136T=.075	
	.075S/.150L=.047 .250 Joggle, Shifted	
	.075S/.157L=.075	
	.075S/.176T=.113 3/16" joggle tool, no shim	
	.075S/.222L=.110 1/4" joggle tool	
	.075S/.240T=.157	
	.075S/.300T=.219 3/8" joggle tool .070 shim	
	.090S/.172T=.088	Copper
	.104S/.098L=.020	.125C/.140L=.030
	.104S/.120T=.035	.125C/.187T=.054
	.104S/.167T=.069	.125C/.280T=.130
	.104S/.312T=.154	.125C/.312T=.135
	.119S/.399T=.250 1/2" JOGGLE TOOL W/.090" SHIM	.125C/.342T=.200
	.135S/.120L=.040 1/4" joggle tool	.125C/.467T=.310
	.135S/.250L=.095	