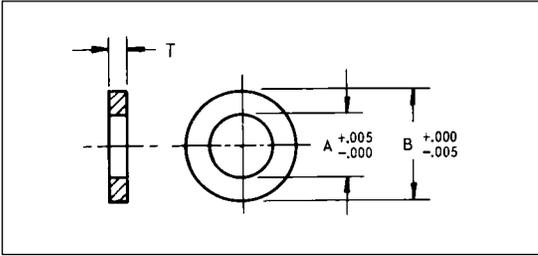


# OUTER RACE SHIM SPACERS



Material: 300 Series Stainless Steel

## EXAMPLE



THICKNESS TOLERANCES			
T	.003 to .007	.010 to .020	.062 to .500
Tolerance	±.0005	±.001	±.002

Bearing Size (Ref.) I.D. X O.D.	A	B	T	Part No.
3/64 X 5/32	.088	.153	.003	<b>B3-39</b>
			.005	<b>B3-40</b>
			.007	<b>B3-41</b>
			.010	<b>B3-42</b>
			.020	<b>B3-43</b>
.055 X 3/16	.123	.178	.003	<b>B3-44</b>
			.005	<b>B3-45</b>
			.007	<b>B3-46</b>
			.010	<b>B3-47</b>
5/64 X 1/4 & 1/8 X 1/4	.167	.248	.003	<b>B3-31</b>
			.005	<b>B3-32</b>
			.007	<b>B3-33</b>
			.010	<b>B3-34</b>
3/32 X 5/16 & 1/8 X 5/16	.206	.310	.003	<b>B3-35</b>
			.005	<b>B3-36</b>
			.007	<b>B3-37</b>
			.010	<b>B3-38</b>
1/8 X 3/8 & 3/16 X 3/8	.253	.373	.020	<b>B3-50</b>
			.003	<b>B3-1</b>
			.005	<b>B3-2</b>
			.007	<b>B3-3</b>
			.010	<b>B3-4</b>
			.020	<b>B3-5</b>
			.062	<b>B3-16</b>
			.125	<b>B3-17</b>
			.250	<b>B3-18</b>
			.375	<b>B3-19</b>
			.500	<b>B3-20</b>

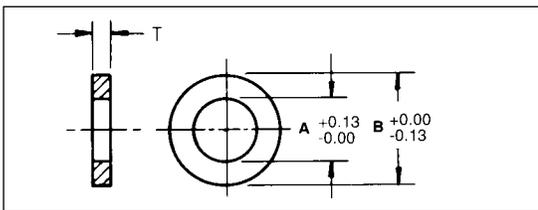
Bearing Size (Ref.) I.D. X O.D.	A	B	T	Part No.
3/16 X 1/2 & 1/4 X 1/2	.378	.498	.003	<b>B3-6</b>
			.005	<b>B3-7</b>
			.007	<b>B3-8</b>
			.010	<b>B3-9</b>
			.020	<b>B3-10</b>
			.062	<b>B3-21</b>
			.125	<b>B3-22</b>
			.003	<b>B3-11</b>
1/4 X 5/8	.503	.623	.005	<b>B3-12</b>
			.007	<b>B3-13</b>
			.010	<b>B3-14</b>
			.020	<b>B3-15</b>
			.125	<b>B3-26</b>
3/8 X 7/8	.687	.873	.062	<b>B3-27</b>
			.003	<b>B3-51</b>
			.005	<b>B3-52</b>
			.007	<b>B3-53</b>
			.010	<b>B3-54</b>
			.020	<b>B3-55</b>
			.062	<b>B3-56</b>

## OUTER RACE KITS

Bearing Shaft Spacers—Stainless Steel Outer Race. Assorted Thickness for 1/8", 3/16" & 1/4" Bearing Bores	350	Y28K
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# METRIC OUTER RACE SHIM SPACERS

All Dimensions in Millimeters



Material: 300 Series Stainless Steel

## EXAMPLE

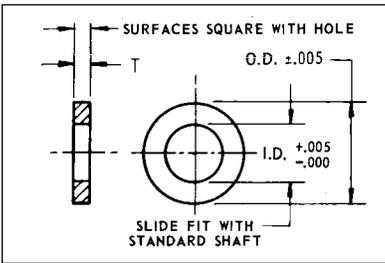


THICKNESS TOLERANCES				
Thickness (T)	0.1	0.25	0.5	1.5
Tolerance	±0.013	±0.025	±0.025	±0.05

Bearing Size (Ref.) I.D. X O.D.	A	B	T	Part No.
3 X 7	5	6.95	0.1	<b>MSP6-1</b>
			0.25	<b>MSP6-2</b>
			0.5	<b>MSP6-3</b>
			1.5	<b>MSP6-4</b>
4 X 9	6.5	8.95	0.1	<b>MSP6-5</b>
			0.25	<b>MSP6-6</b>
			0.5	<b>MSP6-7</b>
			1.5	<b>MSP6-8</b>
5 x 11	8	10.95	0.1	<b>MSP6-9</b>
			0.25	<b>MSP6-10</b>
			0.5	<b>MSP6-11</b>
			1.5	<b>MSP6-12</b>

Bearing Size (Ref.) I.D. X O.D.	A	B	T	Part No.
6 X 13	9.5	12.95	0.1	<b>MSP6-13</b>
			0.25	<b>MSP6-14</b>
			0.5	<b>MSP6-15</b>
			1.5	<b>MSP6-16</b>
8 X 16	12	15.95	0.1	<b>MSP6-17</b>
			0.25	<b>MSP6-18</b>
			0.5	<b>MSP6-19</b>
			1.5	<b>MSP6-20</b>
10 x 19	14.5	18.95	0.1	<b>MSP6-21</b>
			0.25	<b>MSP6-22</b>
			0.5	<b>MSP6-23</b>
			1.5	<b>MSP6-24</b>

# INNER RACE SHAFT SPACERS — 3/32" To 1/2" Bores



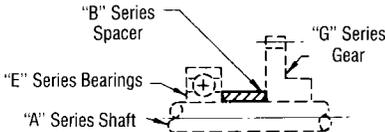
Material: 300 Series Stainless Steel

Shaft	I.D.	O.D.
5/64	.078	.164
3/32	.093	.203
1/8	.125	.187
3/16	.187	.250
1/4	.250	.375
5/16	.313	.500
3/8	.375	.562
1/2	.500	.750

T	Tolerance
.002 to .008	±.0005
.010 to .016	±.001
.031 to .500	±.002

T	5/64" Spacer Part No.	3/32" Spacer Part No.	1/8" Spacer Part No.	3/16" Spacer Part No.	1/4" Spacer Part No.	5/16" Spacer Part No.	3/8" Spacer Part No.	1/2" Spacer Part No.
.002	B8-23	B6-23	B4-23	B6-24	B8-24	B14-23	B12-23	B15-23
.004	B8-16	B6-16	B4-1	B6-1	B8-1	B14-16	B12-1	B15-16
.006	B8-17	B6-17	B4-2	B6-2	B8-2	B14-17	B12-2	B15-17
.008	B8-18	B6-18	B4-3	B6-3	B8-3	—	B12-3	—
.010	B8-19	B6-19	B4-4	B6-4	B8-4	B14-19	B12-4	B15-19
.012	B8-20	B6-20	B4-5	B6-5	B8-5	B14-20	B12-5	B15-20
.014	B8-21	B6-21	B4-6	B6-6	B8-6	B14-21	B12-6	B15-21
.016	B8-22	B6-22	B4-7	B6-7	B8-7	B14-22	B12-7	B15-22
.031	—	—	B4-8	B6-8	B8-8	B14-24	B12-8	B15-24
.063	—	—	B4-9	B6-9	B8-9	B14-25	B12-9	B15-25
.094	—	—	B4-10	B6-10	B8-10	—	B12-10	—
.125	—	—	B4-11	B6-11	B8-11	—	B12-11	—
.188	—	—	B4-12	B6-12	B8-12	—	B12-12	—
.250	—	—	B4-13	B6-13	B8-13	—	B12-13	—
.375	—	—	B4-14	B6-14	B8-14	—	B12-14	—
.500	—	—	B4-15	B6-15	B8-15	—	B12-15	—

## EXAMPLE



## INNER RACE KITS

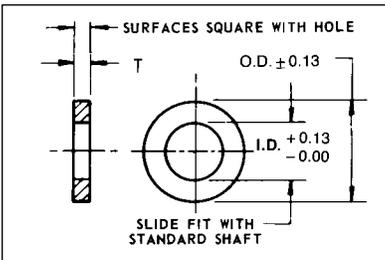
Bearing Shaft Spacers—Stainless Steel  
Inner Race. Assorted Thickness for  
1/8", 3/16" & 1/4" Shaft Sizes

350

Y27K

# METRIC INNER RACE SHAFT SPACERS — 3, 4, 6 & 10 mm Bores

All Dimensions in Millimeters



Material: 300 Series Stainless Steel

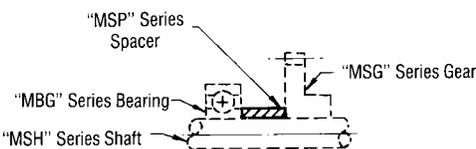
Shaft Size	Spacer	
	Inside Dia.	Outside Dia.
3	3.05	5
4	4.05	6
6	6.05	10
10	10.05	14

T	Tolerance
0.05-0.20	±0.013
0.25-0.40	±0.025
0.80-12.0	±0.050

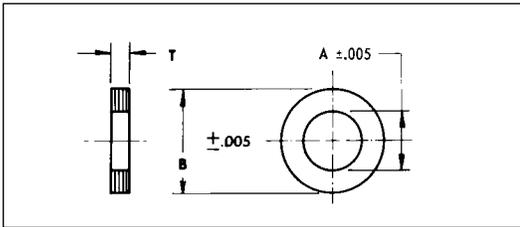
T	3 Shaft Spacer Part Number	4 Shaft Spacer Part Number	6 Shaft Spacer Part Number	10 Shaft Spacer Part Number
0.05	MSP1-1	MSP2-1	MSP3-1	MSP4-1
0.10	MSP1-2	MSP2-2	MSP3-2	MSP4-2
0.15	MSP1-3	MSP2-3	MSP3-3	MSP4-3
0.20	MSP1-4	MSP2-4	MSP3-4	MSP4-4
0.25	MSP1-5	MSP2-5	MSP3-5	MSP4-5
0.30	MSP1-6	MSP2-6	MSP3-6	MSP4-6
0.35	MSP1-7	MSP2-7	MSP3-7	MSP4-7
0.40	MSP1-8	MSP2-8	MSP3-8	MSP4-8
0.80	MSP1-9	MSP2-9	MSP3-9	MSP4-9
1.60	MSP1-10	MSP2-10	MSP3-10	MSP4-10
2.40	MSP1-11	MSP2-11	MSP3-11	MSP4-11
3.00	MSP1-12	MSP2-12	MSP3-12	MSP4-12
4.50	MSP1-13	MSP2-13	MSP3-13	MSP4-13
6.00	MSP1-14	MSP2-14	MSP3-14	MSP4-14
10.00	MSP1-15	MSP2-15	MSP3-15	MSP4-15
12.00	MSP1-16	MSP2-16	MSP3-16	MSP4-16

Special Spacers Available, Consult Factory.

## EXAMPLE



# LAMINATED BRASS SHIM SPACERS



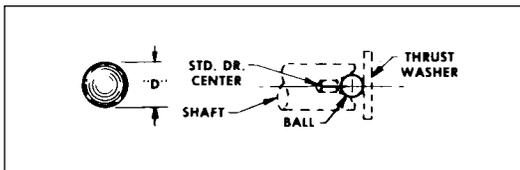
Material: Laminated Brass Shims (.002 Lamination)  
MIL-S-22499B COMP.2 CLASS 1

Shaft Size	Type	A	B	T	Part No.
1/8	Outer Race	.312	.370	1/32	<b>B1-1</b>
3/16	Bearing	.375	.498		<b>B1-2</b>
1/4	Spacer	.437	.623		<b>B1-3</b>
3/8	(See Note)	.687	.873		<b>B1-4</b>
1/8	Shaft Spacer	.135	.234	1/32	<b>B2-1</b>
3/16		.193	.375		<b>B2-2</b>
1/4		.255	.500		<b>B2-3</b>
3/8		.380	.620		<b>B2-4</b>

NOTE: B1 SERIES OD TOLERANCE  $+ .000$   
 $- .005$

# PRECISION BALLS — Inch and Metric

Stainless Steel & Nylon



Material: 440 Stainless Steel, Grade #50  
Hardened to RC55-60  
Zytel 101 Nylon

INCH  
Nylon

D	Part No.
.0937	<b>AL-1</b>
.1250	<b>AL-2</b>
.1562	<b>AL-3</b>
.1875	<b>AL-4</b>
.2187	<b>AL-5</b>
.2500	<b>AL-6</b>
.3750	<b>AL-7</b>
.5000	<b>AL-8</b>
±.002	

Stainless Steel

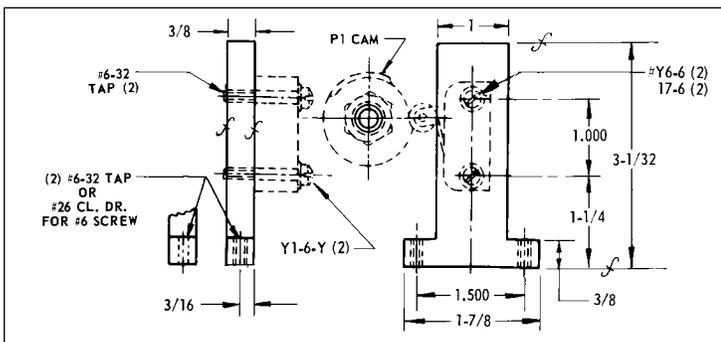
D	Part No.
.06250	<b>AK-1</b>
.09375	<b>AK-2</b>
.12500	<b>AK-3</b>
.15625	<b>AK-4</b>
.18750	<b>AK-5</b>
.25000	<b>AK-6</b>
.31250	<b>AK-7</b>
.37500	<b>AK-8</b>
.50000	<b>AK-9</b>
±.00005	

METRIC  
Stainless Steel

D	Part No.
1.5000	<b>MBL1-1</b>
2.5000	<b>MBL1-2</b>
3.0000	<b>MBL1-3</b>
4.0000	<b>MBL1-4</b>
5.0000	<b>MBL1-5</b>
6.0000	<b>MBL1-6</b>
±.0013	

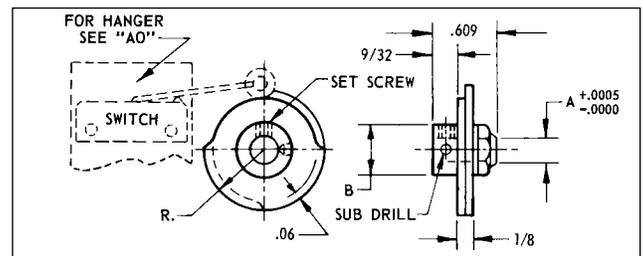
All dimensions in Millimeters

# CAM SWITCH HANGER & ADJUSTABLE CAM ASSEM.

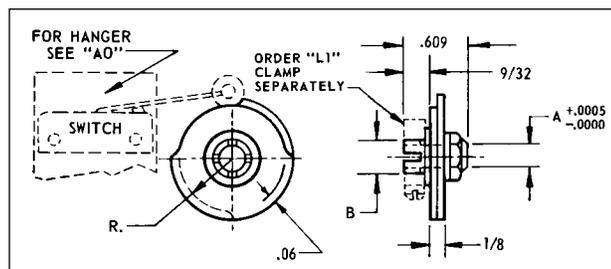


Material: Aluminum (Cast)  
Finish: Chromic Acid Anodized

Part No. Tap Holes	Part No. Cl. Holes
<b>A0-1T</b>	<b>A0-1C</b>



A	B	R	Sub Drill	Set Screw	Part No.
.2498	.50	5/8	#50	#6-32	<b>P1-3</b>
.2498	.50	11/32	#50	#6-32	<b>P1-9</b>

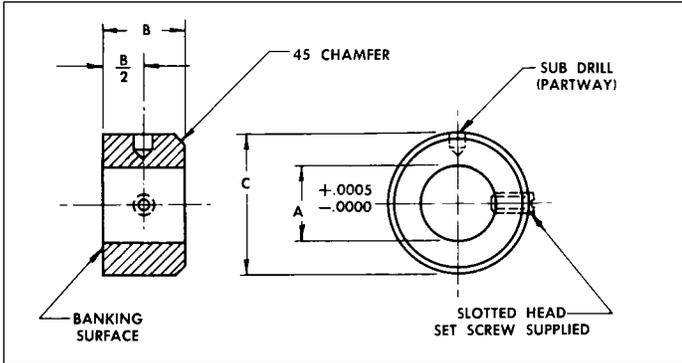


Material: 303 Stainless Steel  
Finish: Clear Passivate

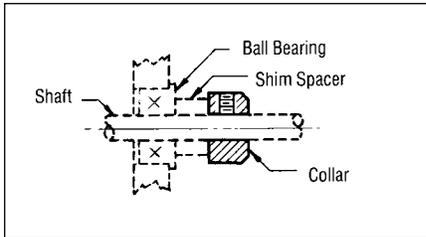
A	B	R	Part No.
.2498	.312	5/8	<b>P1-6</b>
.2498	.312	11/32	<b>P1-12</b>

Other Bore Sizes Available, Consult Factory.

# PRECISION SET SCREW COLLARS



Material: 303 Stainless Steel



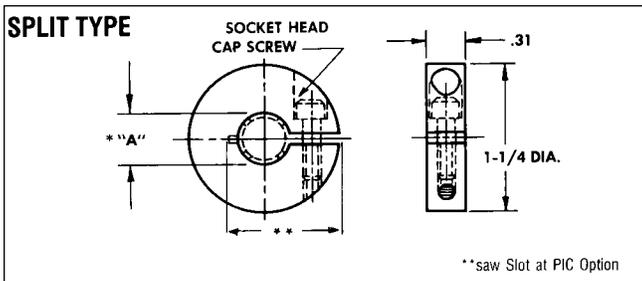
Shaft Size	A	B	C	Set Screw	Part No.
3/32	.0935	.12	1/4	# 0-80	C1-8
1/8	.1248	.18	5/16	# 2-56	C1-1
5/32	.1560	.18	5/16	# 2-56	C1-5
3/16	.1873	.22	3/8	# 4-40	C1-2
1/4	.2498	.25	1/2	# 6-32	C1-3
5/16	.3123	.28	9/16	# 6-32	C1-9
3/8	.3748	.37	3/4	#10-32	C1-10
1/2	.4998	.50	1	1/4-20	C1-11

Dimensions Below Are In Millimeters

Shaft Size	A	B	C	Set Screw	Part No.
3	2.995	4.57	7.9	M2X.4	MSC1-1
4	3.995	5.59	9.5	M2X.4	MSC1-2
5	4.995	5.59	9.5	M3X.5	MSC1-3
6	5.995	6.35	12.7	M3X.5	MSC1-4
8	7.995	7.11	14.3	M3X.5	MSC1-5
10	9.995	9.4	19.1	M5X.8	MSC1-6
12	11.995	12.7	25.4	M6X.1	MSC1-7

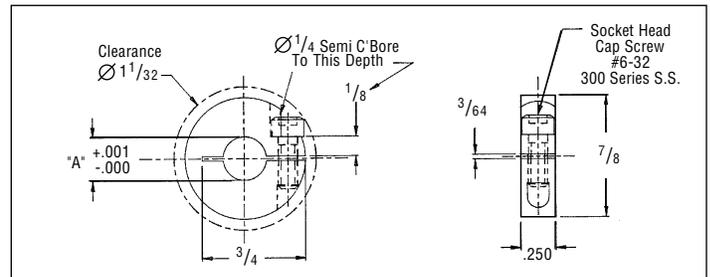
Special Collars Available, Consult Factory.  
For "No-Mar" Set Screws See CS Series.

# CLAMPS - SPLIT & SCREW TYPES — 1/8" To 1/2" Shaft Size



Material: 303 Stainless Steel

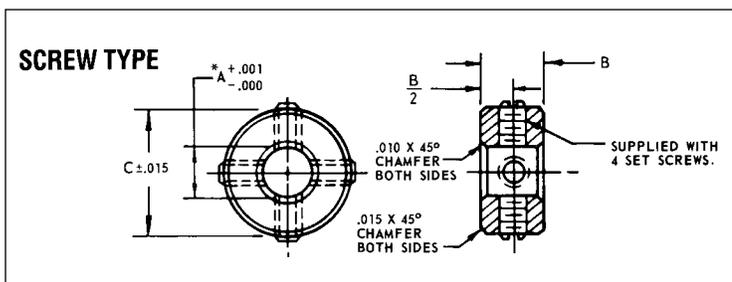
Ref. Gear Bore	*A +.001 -.000	Part No.
5/16	.375	L1-20
3/8	.437	L1-21
1/2	.562	L1-22



Material: 303 Stainless Steel

Ref. Gear Bore	*A +.001 -.000	Part No.
1/8	.188	L4-1
3/16	.250	L4-2
1/4	.313	L4-3

Also Available In Aluminum, Consult Factory.



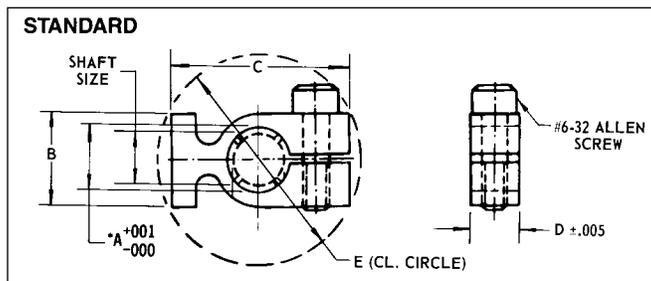
Material: 303 Stainless Steel

\*NOTE: "A" diameter is O.D. of split hub gear or sprocket & is I.D. of clamp.

Ref. Gear Bore	*A +.001 -.000	B	C	Set Screws	Part No.
1/8	.188	.25	.37	#4-40	L4-13
3/16	.250	.25	.50	#6-32	L4-14
1/4	.313	.25	.50	#6-32	L4-15

Also Available In Aluminum, Consult Factory.

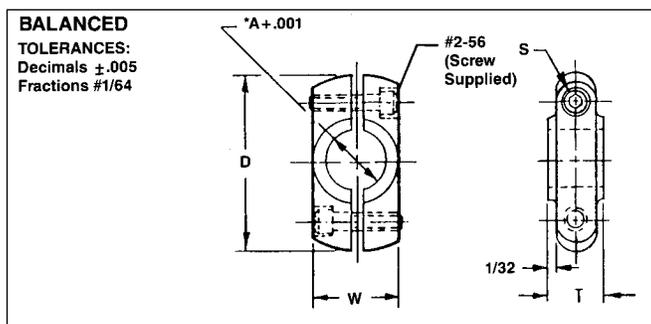
# ADJUSTABLE HUB CLAMP



Material: 416 Stainless Steel — Heat Treated RC38-45

Ref. Gear Bore	*A	B	C	D	E	Finish	Part No.
1/8	.188	5/16	11/16		7/8	Black Passivate	L1-1
3/16	.250	3/8	13/16	.240	1-1/32		L1-2
1/4	.312	7/16	13/16		1-1/8		L1-3
1/8	.188	5/16	11/16		7/8	Clear Passivate	L1-4
3/16	.250	3/8	13/16	.240	1-1/32		L1-5
1/4	.312	7/16	13/16		1-1/8		L1-6

\*NOTE: "A" diameter is O.D. of split hub gear or sprocket & is I.D. of clamp.



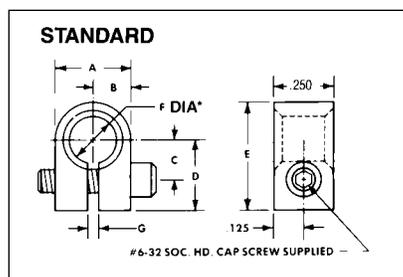
Material: 416 Stainless Steel — Heat Treated RC38-45

Ref. Gear Bore	*A	D	T	W	Type Balance	Part No.
1/8	.188	23/32	.240	5/16	As Machined	L1-7
3/16	.250	3/4	.240	3/8		L1-8
1/4	.312	7/8	.240	7/16		L1-9

Dynamically balanced units available on request. Consult Factory.

# ADJUSTABLE HUB CLAMP — .188" To .438" Bores

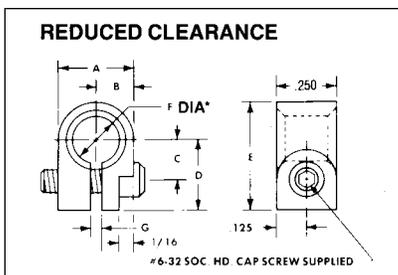
## Miniature



Material: 303 Stainless Steel  
416 Stainless Steel Available on Request, Consult Factory.

Ref. Gear Bore	F Dia. ±.0005	A	B	C	D	E	G	Part No.
1/8	.188	.312	.156	.187	.312	15/32	.031	L5-1
3/16	.251	.375	.188	.256	.375	9/16	.046	L5-2
1/4	.313	.437	.218	.250	.375	19/32	.046	L5-3
5/16	.376	.500	.250	.281	.406	21/32	.046	L5-4
3/8	.438	.625	.312	.343	.468	25/32	.046	L5-5

\*NOTE: "F" diameter is O.D. of split hub gear or sprocket & is I.D. of clamp.

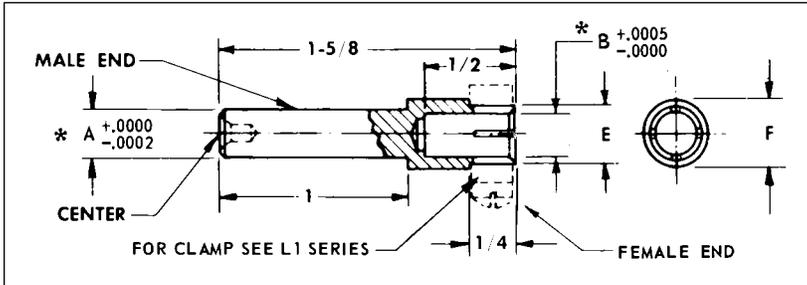


Material: 303 Stainless Steel  
416 Stainless Steel Available on Request, Consult Factory

Ref. Gear Bore	F Dia. ±.0005	A	B	C	D	E	G	Part No.
1/8	.188	.312	.156	.187	.312	15/32	.031	L6-1
3/16	.251	.375	.188	.256	.375	9/16	.046	L6-2
1/4	.313	.437	.218	.250	.375	19/32	.046	L6-3
5/16	.376	.500	.250	.281	.406	21/32	.046	L6-4
3/8	.438	.625	.312	.343	.468	25/32	.046	L6-5

# SHAFT EXTENSIONS

1/4", 3/8" Bores



Shaft Size	A*	B**	E	F	Part No.
Male to Female					
1/4 to 1/4	.2497	.2498	.312	.375	AU-3
3/16 to 1/4	.1872	.2498	.312	.375	AU-6
1/4 to 1/8	.2497	.1248	.188	.250	AU-8
1/4 to 3/8	.2497	.3748	.437	.500	AU-11
3/8 to 1/4	.3747	.2498	.312	.375	AU-12

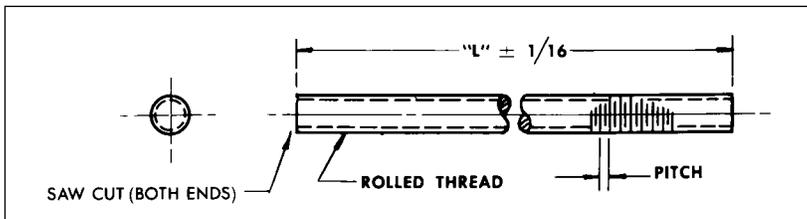
\*Inch Shaft Dia. Toler. +.0000, -.0002

\*\*Inch Bores Toler. +.0005, -.0000

Material: 303 Stainless Steel

\*Diameters Concentric Within .0005 T.I.R.

## STAINLESS THREADED STOCK — #2-56 To 3/8 -16

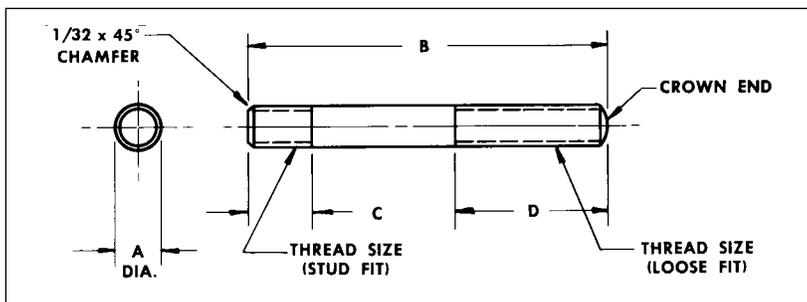


Thread	D	Pitch	L	Part No.
# 2-56	.086	.018	12	A9-10
# 4-40	.112	.025		A9-11
# 6-32	.138	.031		A9-1
# 8-32	.164	.031		A9-2
#10-32	.190	.031	16	A9-4
1/4 -20	1/4	.050	24	A9-5
1/4 -28	1/4	.036		A9-6
5/16-18	5/16	.055		A9-7
3/8 -16	3/8	.062		A9-8

Material: 300 Series Stainless Steel

Other Lengths, Diameters and Modifications Available, Consult Factory.

## STAINLESS THREADED STOCK — #2-56 To 3/8 -16



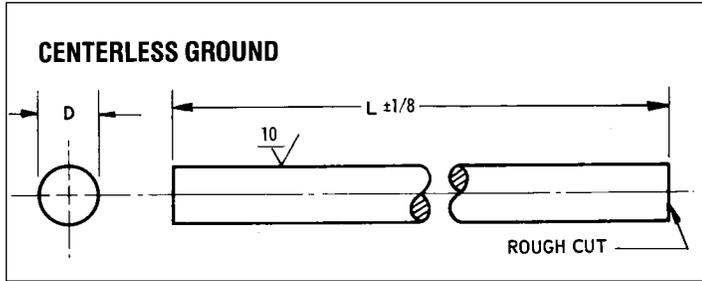
Material: 303 Stainless Steel

Thread Size	A	B	C	D	Part No.
#6-32	.138	1	7/32	1/2	2040
		1-1/4		5/8	2041
		1-1/2		3/4	2042
		1-3/4		3/4	2043
		2		3/4	2044
#8-32	.164	1	7/32	1/2	2045
		1-1/4		5/8	2046
		1-1/2		3/4	2047
		1-3/4		3/4	2048
		2		3/4	2049

Thread Size	A	B	C	D	Part No.
#10-32	.190	1	7/32	1/2	2055
		1-1/4		5/8	2056
		1-1/2		3/4	2057
		1-3/4		3/4	2058
		2		3/4	2059
1/4-20	.250	1-1/4	9/32	5/8	2060
		1-1/2		5/8	2061
		1-3/4		3/4	2062
		2		3/4	2063
		2-1/2		3/4	2064
3	1	2065			

# PRECISION GROUND SHAFTING — 1/32" To 1" Diameter

Nominal, Undersized and Oversized Diameters



Material: 303 Stainless Steel

Diameter Tolerance	
1/32 TO 1/2	+ .0000 - .0002
5/8 TO 1	+ .0000 - .0004

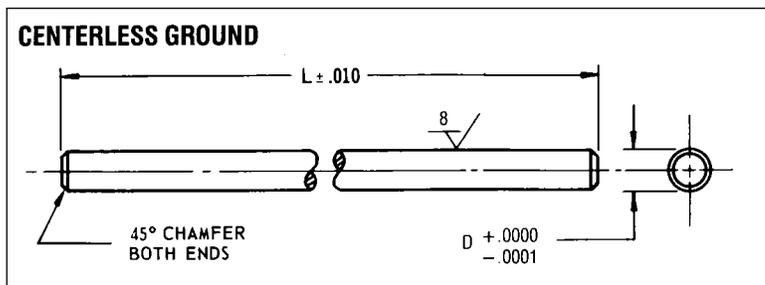
Fractional Dia. (Ref.)	D	L	Part No.
1/32	.0313	12	A8-1
	.0317		A8-23
1/16	.0622	12	A8-24
	.0626		A8-2
	.0630		A8-25
5/64	.0778	12	A8-20
	.0781		A8-22
	.0786		A8-26
3/32	.0934	12	A8-21
	.0938		A8-3
	.0942		A8-27
1/8	.1247	24	A8-6
	.1250	12	A8-5
	.1251		A8-4
	.1255	24	A8-28
5/32	.1559	24	A8-29
	.1562		A8-18
	.1567		A8-30
3/16	.1872	24	A8-9
	.1875		A8-7
	.1880		A8-31
7/32	.2184	24	A8-32
	.2187		A8-19
	.2192		A8-33
1/4	.2497	24	A8-11
	.2497	36	A8-34

Fractional Dia. (Ref.)	D	L	Part No.
1/4	.2500	24	A8-10
		36	A8-35
5/16	.3122	24	A8-13
			.3125
3/8	.3747	16	A8-15
		36	A8-38
		16	A8-14
		36	A8-39
1/2	.4997	16	A8-17
		36	A8-41
		16	A8-16
		36	A8-42
5/8	.6247	36	A8-44
			.6250
3/4	.7497	36	A8-47
			.7500
1	.9997	36	A8-50
			1.0000

For Pre-Cut and Chamfered Precision Ground Shafting, See A1 through A7 Series.  
Other Lengths, Diameters and Modifications Available, Consult Factory.

# ULTRA PRECISION SHAFTING — 1/8", 3/16" and 1/4" Diameter

Nominal, Undersized and Oversized Diameters



Material: 303 Stainless Steel

Diameter	D	Straightness Tolerance
1/8	.12475	.0002
3/16	.18725	.00015
1/4	.24975	.0001

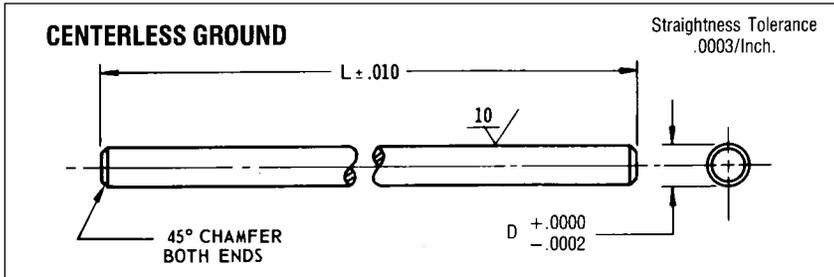
L	1/8 Dia. Part No.	3/16 Dia. Part No.	1/4 Dia. Part No.
1.00	A4-10	—	—
1.12	A4-11	—	—
1.25	—	A5-12	—
1.37	A4-13	—	—
1.50	—	A5-15	A6-15
1.75	A4-17	A5-17	—
1.88	A4-18	—	—
2.00	A4-20	A5-20	A6-20
2.50	—	—	A6-25
2.75	—	—	A6-27
3.00	—	A5-30	—
3.12	—	—	A6-31
3.25	A4-32	—	—
3.50	—	—	A6-35
4.00	—	—	A6-40
4.25	—	—	A6-42

Sold in increments of 5 pcs.  
Other Lengths, Diameters and Modifications Available, Consult Factory.

# PRECISION GROUND SHAFTING — 1/8", 3/16", 1/4", & 3/8" Diameters

Designed to fit "E" Series Ball Bearings, and "AM" Oil-Impregnated Bearings

PIC Ground Stock Shafting has been established to meet the majority of precision shaft requirements. All shaft material made of 303 Stainless Steel is ground to a 10 micro finish or better.

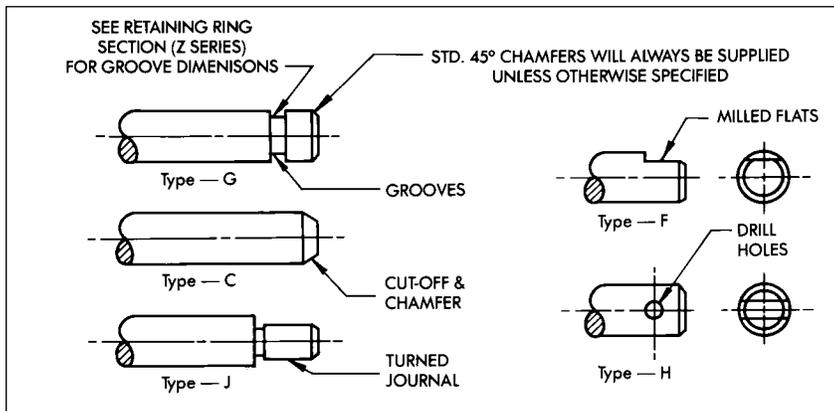


Material: 303 Stainless Steel

Dia.	D
1/8"	.1247
3/16"	.1872
1/4"	.2497
3/8"	.3747

## SHAFT MODIFICATIONS

Illustrated below are standard shaft modifications available on request. For other configurations, send drawing or sketch for quotation.



*L	1/8 Dia. Part No.	3/16 Dia. Part No.	1/4 Dia. Part No.	3/8 Dia. Part No.
1.00	A1-10	A2-10	A3-10	—
1.12	A1-11	A2-11	A3-11	—
1.25	A1-12	A2-12	A3-12	—
1.37	A1-13	A2-13	A3-13	—
1.50	A1-15	A2-15	A3-15	—
1.62	A1-16	A2-16	A3-16	—
1.75	A1-17	A2-17	A3-17	—
1.87	A1-18	A2-18	A3-18	—
2.00	A1-20	A2-20	A3-20	A7-20
2.12	A1-21	A2-21	A3-21	—
2.25	A1-22	A2-22	A3-22	A7-22
2.37	A1-23	A2-23	A3-23	—
2.50	A1-25	A2-25	A3-25	A7-25
2.62	A1-26	A2-26	A3-26	—
2.75	A1-27	A2-27	A3-27	A7-27
2.87	A1-28	A2-28	A3-28	—
3.00	A1-30	A2-30	A3-30	A7-30
3.12	A1-31	A2-31	A3-31	—
3.25	—	A2-32	A3-32	A7-32
3.37	—	A2-33	A3-33	—
3.50	A1-35	A2-35	A3-35	A7-35
3.62	—	A2-36	A3-36	—
3.75	—	A2-37	A3-37	A7-37
3.87	—	—	A3-38	—
4.00	A1-40	A2-40	A3-40	A7-40
4.12	—	—	A3-41	—
4.25	A1-42	—	A3-42	A7-42
4.37	—	—	A3-43	—
4.50	A1-45	A2-45	A3-45	A7-45
4.62	—	—	A3-46	—
4.75	—	—	A3-47	A7-47
4.87	—	—	A3-48	—
5.00	A1-50	A2-50	A3-50	A7-50
5.12	A1-51	—	A3-51	—
5.25	A1-52	A2-52	A3-52	A7-52
5.37	A1-53	—	A3-53	—
5.50	A1-55	—	A3-55	A7-55
5.62	A1-56	—	A3-56	—
5.75	A1-57	A2-57	A3-57	A7-57
5.87	—	—	A3-58	—
6.00	A1-60	A2-60	A3-60	A7-60
6.25	—	A2-62	A3-62	—
6.37	—	—	A3-63	—
6.50	—	—	A3-65	A7-65
6.62	—	—	A3-66	—
6.75	A1-67	—	—	—
7.00	—	A2-70	A3-70	—
7.50	—	A2-75	A3-75	—
8.00	—	A2-80	A3-80	A7-80
8.50	—	A2-85	A3-85	—
9.00	A1-90	—	A3-90	A7-90
9.50	—	—	A3-95	—
10.00	—	A2-100	A3-100	A7-100
11.00	—	—	—	A7-110
12.00	A1-120	A2-120	A3-120	A7-120
13.00	—	—	A3-130	—
14.00	—	—	A3-140	—
15.00	—	—	A3-150	—
16.00	A1-160	—	A3-160	A7-160
20.00	—	—	—	A7-200
24.00	—	—	—	A7-240

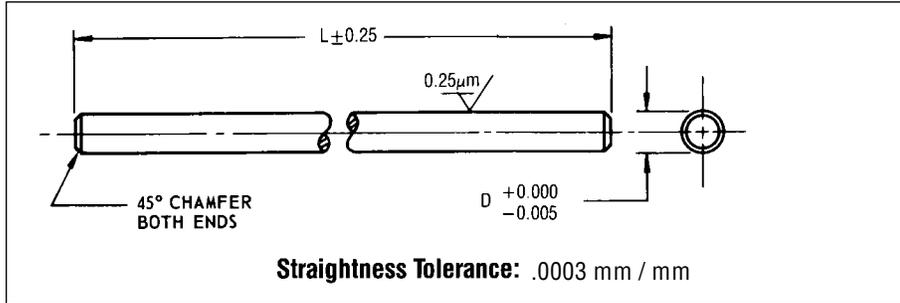
For Longer Lengths, See "A8" Series.

\* A1, A2 and A3 series, 1" thru 6" lengths, are sold in increments of 5 pcs.

Other Lengths, Diameters and Modifications Available, Consult Factory.

# METRIC PRECISION GROUND SHAFTING — 3, 4, 5 & 6 mm Diameters

All Dimensions in Millimeters



Material: 303 Stainless Steel

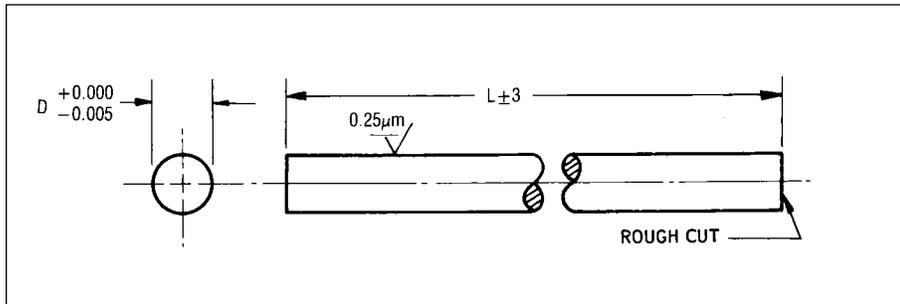
Diameter	D
3	2.993
4	3.993
5	4.993
6	5.993

Length	3 mm Part No.	4 mm Part No.	5 mm Part No.	6 mm Part No.
25	MSH1-1	MSH2-1	MSH3-1	MSH4-1
30	MSH1-2	MSH2-2	MSH3-2	MSH4-2
35	MSH1-3	MSH2-3	MSH3-3	MSH4-3
40	MSH1-4	MSH2-4	MSH3-4	MSH4-4
45	MSH1-5	MSH2-5	MSH3-5	MSH4-5
50	MSH1-6	MSH2-6	MSH3-6	MSH4-6
55	MSH1-7	MSH2-7	MSH3-7	MSH4-7
60	MSH1-8	MSH2-8	MSH3-8	MSH4-8
65	MSH1-9	MSH2-9	MSH3-9	MSH4-9
70	MSH1-10	MSH2-10	MSH3-10	MSH4-10
75	MSH1-11	MSH2-11	MSH3-11	MSH4-11
80	MSH1-12	MSH2-12	MSH3-12	MSH4-12
85	MSH1-13	MSH2-13	MSH3-13	MSH4-13
90	MSH1-14	MSH2-14	MSH3-14	MSH4-14
95	MSH1-15	MSH2-15	MSH3-15	MSH4-15
100	MSH1-16	MSH2-16	MSH3-16	MSH4-16
105	MSH1-17	MSH2-17	MSH3-17	MSH4-17
110	MSH1-18	MSH2-18	MSH3-18	MSH4-18
115	MSH1-19	MSH2-19	MSH3-19	MSH4-19
120	MSH1-20	MSH2-20	MSH3-20	MSH4-20
125	MSH1-21	MSH2-21	MSH3-21	MSH4-21
150	MSH1-22	MSH2-22	MSH3-22	MSH4-22
175	MSH1-23	MSH2-23	MSH3-23	MSH4-23
200	MSH1-24	MSH2-24	MSH3-24	MSH4-24
225	MSH1-25	MSH2-25	MSH3-25	MSH4-25
250	MSH1-26	MSH2-26	MSH3-26	MSH4-26

Other Lengths, Diameters and Modifications Available, Consult Factory.

# METRIC PRECISION GROUND SHAFTING — 3, 4, 6, 8, 10 & 12 mm Dia.

All Dimensions in Millimeters



Material: 303 Stainless Steel  
Surface Finish: 0.25 μm

D	L	Part No.
2.993	600	MSH7-1
3.000		MSH7-2
3.993	600	MSH7-3
4.000		MSH7-4
5.993	600	MSH7-5
6.000		MSH7-6
7.993	600	MSH7-7
8.000		MSH7-8
9.993	1000	MSH7-9
10.000		MSH7-10
11.993	1000	MSH7-11
12.000		MSH7-12

Other Lengths, Diameters and Modifications Available, Consult Factory.

# PRECISION CASE HARDENED & GROUND SHAFTING

Inch and Metric

For Linear Motion Applications



## Materials and Hardness:

AISI C-1060\* steel, case hardened to Rockwell 60-65C  
 440 C stainless steel, case hardened to Rockwell 50-55C  
 303 stainless steel, (for use with engineered plastic bearings),  
 has approximate hardness of Rockwell 75-95B.  
 \*C-1060 can be supplied with hard satin chrome finish at additional cost.  
 (Adds .0001 to .0002 to diameter).

**Finish:** Normally between 10 and 16 micro-inches RMS. Other finishes can be furnished to meet special requirements.

**Length Tolerances:** Shafting is stocked in 6 to 10 foot lengths, and is supplied to required lengths  $\pm 1/16"$  ( $\pm 1.5\text{mm}$ ). If required, closer length tolerances can be supplied at additional cost.

**Straightness:** With the exception of 1/4" and 3/8" diameters, the standard straightness tolerance is .001"-.002" per foot cumulative. Straighter lengths to meet more stringent requirements can be supplied at additional cost.

**Chamfered Ends:** Normally, all shafts are rough cut. Precision chamfers or other dimensions are classified as a special fabrication and carry extra charges.

**Maximum Lengths:** The maximum lengths in stock for each diameter are shown in the tables.  
 For pre-drilled shafting, see page 4-4.

## HOW TO ORDER

When ordering shafts that do not require any special machining, simply add length (in inches or mm) requirement to Part Number.

Example: A10-8-20.375 = 1060 hardened shafting, 1/2" diameter, 20 3/8" long.

### Inch Shaft Diameters

Nominal Diameter (Inches)	Size & Tol. (Inches)	Max Length (ft)	C-1060 Steel Hardened & Ground		440 C stainless Hardened & Ground		303 Stainless Steel Ground Part No.
			Case Depth	Part No.	Case Depth	Part No.	
1/4	.2485/.2490 .2490/.2495	6	.040	A10-4 A10L-4	—	—	A11-4 —
3/8	.3735/.3740 .3740/.3745	6	.040	A10-6 A10L-6	—	—	A11-6 —
1/2	.4985/.4990 .4990/.4995	6	.060	A10-8 A10L-8	.060	A12-8 —	A11-8 —
5/8	.6235/.6240 .6240/.6245	10	.060	A10-10 A10L-10	.060	A12-10 —	A11-10 —
3/4	.7485/.7490 .7490/.7495	10	.060	A10-12 A10L-12	.060	A12-12 —	A11-12 —
1	.9985/.9990 .9990/.9995	10	.080	A10-16 A10L-16	.080	A12-16 —	A11-16 —
1 1/4	1.2485/1.2490 1.2490/1.2495	10	.080	A10-20 A10L-20	.080	A12-20 —	A11-20 —
1 1/2	1.4984/1.4989 1.4989/1.4994	10	.080	A10-24 A10L-24	.080	A12-24 —	A11-24 —

Note: L Series shafting should be used with self-aligning linear bearings.

### Metric Shaft Diameters

Nominal Diameter (mm)	Tolerance $\mu\text{m}$	Max. Length (mm)	C-1060 Steel Hardened & Ground		440C Stainless Steel* Hardened & Ground		303 Stainless Steel Ground Part No.
			Case Depth	Part No.	Case Depth	Part No.	
5	0/-10	700	1.0	MA10-05	1.0	MA12-05	MA11-05
8	0/-10	1500	1.0	MA10-08	1.0	MA12-08	MA11-08
12	0/-10	3000	1.0	MA10-12	1.0	MA12-12	MA11-12
16	0/-10	3000	1.5	MA10-16	1.5	MA12-16	MA11-16
20	0/-12	3000	1.5	MA10-20	1.5	MA12-20	MA11-20
25	0/-12	3000	1.5	MA10-25	1.5	MA12-25	MA11-25
30	0/-12	3000	2.0	MA10-30	2.0	MA12-30	MA11-30
40	0/-15	3000	2.0	MA10-40	2.0	MA12-40	MA11-40

\*Special Orders Only.

Metric Conversion To Inches: .03937 x metric dimension

Inch Conversion To Metric: 25.4 x inch dimension

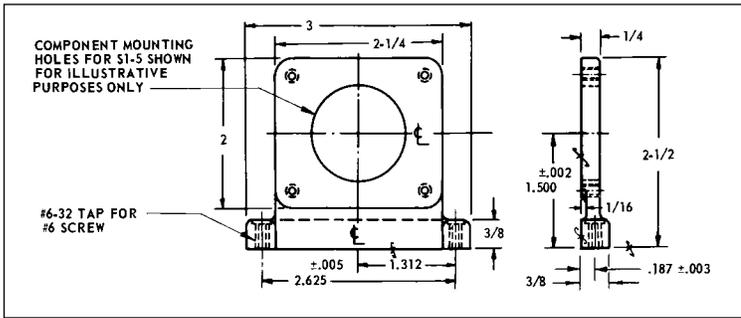
## SPECIAL PRECISION MACHINING

Quotations are provided after receipt of a faxed drawing, rough sketch or verbal description. Indicate quantity required.

Phone: 800-243-6125 ■ FAX: 203-758-8271  
 E-Mail: info@pic-design.com



# COMPONENT MTG. HANGERS

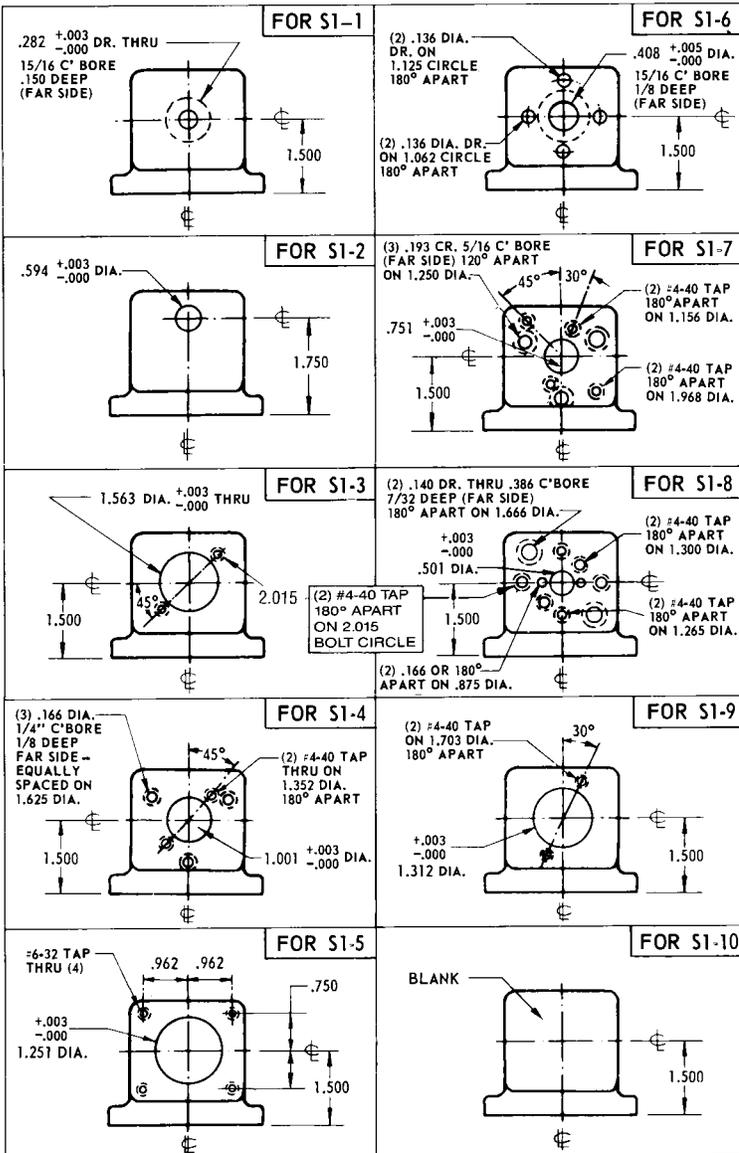


Part No.
S1-1
S1-2
S1-3
S1-4
S1-5

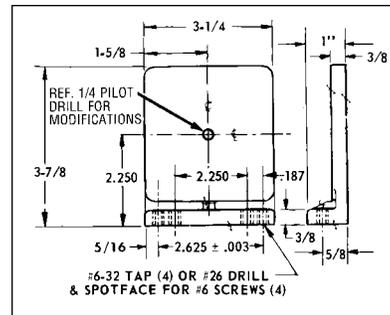
Part No.
S1-6
S1-7
S1-8
S1-9
S1-10

Material: Aluminum  
Finish: Chromic Acid Anodize

## COMPONENT MOUNTING DATA



## LARGE BLANK COMPONENT HANGERS



Material: Aluminum  
Finish: Chromic Acid Anodize

Part No. (Tap Hole)	Part No. (Clearance Hole)
S3-1	S4-1

PIC will modify any series hanger for special rotating components on request.