

Whether the application is to transfer motion or transmit power, PIC Design has the complete range of gearing needed to fulfill any application requirement. Standard gears and assemblies are available for operation on parallel and right-angle shafts, linear motion applications can also be satisfied.

## PIC Design Gears — A Brief Overview

1. **Spur Gears**  
Designed and manufactured to mount on parallel shafts. Available in (inch) Diametral Pitch and (metric) Modules.
2. **Miter & Bevel Gears**  
Designed and manufactured to operate on intersecting shafts positioned at a right angle.
3. **Spiral Gears**  
Designed to operate at right angles with the pinion able to be mounted to mesh with any part of the 360° of the gear.
4. **Cluster Gears**  
Spur gears manufactured to be mounted on a shaft and another gear to be mounted on the cluster for use in multiple gear ratios in a gear box.
5. **Helical Gears**  
Designed with a 45° Helix angle to operate on parallel or right angle shafts.
6. **Anti-Backlash Gears**  
Two independent gears mounted to same hub with a spring between the two providing a constant full-tooth engagement with the mating spur gear, thereby eliminating backlash in the mesh. Available in Spur, Worm and Miter Gears.
7. **Worm & Worm Wheels**  
High ratios attainable in a single reduction with shafts at right angles to each other in limited space.
8. **Pinion Shafts**  
Designed to be either supported by bearings or pressed into hollow shaft to operate with spur gear mounted on parallel shaft.
9. **Racks**  
A gear with the teeth in a straight line, which produces linear motion when meshed with a circular spur gear.
10. For special gears including internal, sector, etc. Please consult factory

# TECHNICAL SECTION

## Tooth Proportions and Formulas for Spur Gears

To Find:		English (Inches)	Metric (Millimeters)
Formulas	Circular Pitch (p)	$p = \frac{\pi D}{N}$ or $\frac{\pi d}{n}$	$p = \pi M$ or $\pi \frac{D}{N}$
	Pitch Diameter Pinion (d)	$\frac{n}{P}$	nM
	Pitch Diameter Gear (D)	$\frac{N}{P}$	NM
	Outside Diameter Pinion (d <sub>o</sub> )	$\frac{n+2}{P}$	(n+2)M
	Outside Diameter Gear (D <sub>o</sub> )	$\frac{N+2}{P}$	(N+2)M
	Center Distance (C)	$\frac{N+n}{2P}$	$\frac{(N+n)M}{2}$
Tooth Proportions	Addendum (a)	$\frac{1.000}{P}$	M
	Dedendum (b)	$\frac{1.200}{P} + 0.002$ (min.)	M + c = 1.16M
	Working Depth (h <sub>w</sub> )	$\frac{2.000}{P}$	2.000M
	Whole Depth (h <sub>t</sub> )	$\frac{2.200}{P} + 0.002$ (min.)	2.16M
	Clearance (c) (Standard)	$\frac{0.200}{P} + 0.002$ (min.)	.1M to .3M (.166M typically)
	Tooth Thickness (t) at Pitch Diameter	$t = \frac{1.5708}{P}$	$t = \frac{\pi M}{2}$

The tooth proportions and formulas for Spur Gears for both inch (Diametral Pitch) and metric (Module) enable the designer or engineer to design the appropriate spur gear for a particular application.

Where P = Diametral Pitch  
M = Module (Metric)  
n = Number of Pinion Teeth  
N = Number of Gear Teeth

### Conversions

$$\text{Diametral Pitch (P)} = \frac{25.4}{M}$$

$$\text{Module (M)} = \frac{25.4}{P}$$

$$\text{Millimeters (mm)} = \frac{\text{Inches}}{.03937} = 25.4 \text{ Inches}$$

$$\text{Inches} = .03937 \text{ mm} = \frac{\text{mm}}{25.4}$$

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# TOOTH-TO-TOOTH AND TOTAL COMPOSITE TOLERANCE

## AGMA Standards for Inch, DIN Standards for Metric

The AGMA and DIN Fine-Pitch Gear Tolerances for inch and metric spur gears will assist the designer in selecting the AGMA or DIN quality level that will satisfy a particular application.

AGMA 390.03 FINE-PITCH GEAR TOLERANCES

PIC Quality Number	AGMA Quality Number	Number of Teeth and Pitch Diameter	Diametral Pitch Range	Tooth-to-Tooth Composite Tolerance	Total Composite Tolerance
Std.	10*	Up to 20 Teeth Incl.	20 to 200	.0007	.0010
		Over 20 Teeth Up to 1.999"	20 to 200	.0005	.0010
		Over 20 Teeth 2" to 3.999"	20 to 200	.0005	.0012
		Over 20 Teeth 4" and over	20 to 200	.0005	.0014
-Q12	12**	Up to 20 Teeth Incl.	20 to 200	.0004	.0005
		Over 20 Teeth Up to 1.999"	20 to 200	.0003	.0005
		Over 20 Teeth 2" to 3.999"	20 to 200	.0003	.0006
		Over 20 Teeth 4" and over	20 to 200	.0003	.0007
-Q14	14***	Up to 20 Teeth Incl.	20 to 200	.00019	.00027
		Over 20 Teeth Up to 1.999"	20 to 200	.00014	.00027
		Over 20 Teeth 2" to 3.999"	20 to 200	.00014	.00032
		Over 20 Teeth 4" and over	20 to 200	.00014	.00037

AGMA 2015-2-A06 DIN FINE-PITCH GEAR TOLERANCES

PIC Quality Number	DIN Δ Quality Number	Pitch Diameter	Metric Module Range	Tooth-to-Tooth Composite Tolerance μm	Total Composite Tolerance μm
Std.	C7/T7	Up to 12mm	Up to 0.6 Module	7	20
		Over 12 to 50mm		9	25
		Over 50 to 100mm		10	28
		Over 100mm		11	32
T6	C6/T6	Up to 12mm	Over 0.6 Module	8	22
		Over 12 to 50mm		10	28
		Over 50 to 100mm		11	32
		Over 100mm		12	36
T5	C5/T5	Up to 12mm	Up to 0.6 Module	5	14
		Over 12 to 50mm		5.5	16
		Over 50 to 100mm		6	18
		Over 100mm		7	20
T5	C5/T5	Up to 12mm	Over 0.6 Module	5.5	16
		Over 12 to 50mm		6	18
		Over 50 to 100mm		7	20
		Over 100mm		8	22
T5	C5/T5	Over 50 to 100mm	Up to 0.6 Module	3.5	10
		Up to 12mm		4	11
		Over 12 to 50mm		4.5	12
		Over 100mm		5	14
T5	C5/T5	Up to 12mm	Over 0.6 Module	3.5	11
		Over 12 to 50mm		4.5	12
		Over 50 to 100mm		5	14
		Over 100mm		5	16

\* AGMA 390.03/PIC Q10 = AGMA/ANSI 2015-2-A06 C7/ISO T7

\*\* AGMA 390.03/PIC Q12 = AGMA/ANSI 2015-2-A06 C6/ISO T6

\*\*\* AGMA 390.03/PIC Q14 = AGMA/ANSI 2015-2-A06 C5/ISO T5

Δ DIN, ISO, ANSI

# TECHNICAL SECTION

## Table of Pitch Diameters

The Pitch Diameter Tables will enable the designer or engineer to find the pitch diameter of the spur gear using the Diametral Pitch and the number of teeth. To find the Outside Diameter, add Two Teeth to the Number of Teeth and use Pitch Diameter for Outside Diameter.

Example: 72 Diametral Pitch

88 Teeth

Pitch Diameter = 1.2222"

Outside Diameter (Pitch Diameter for 90 Teeth) = 1.2500

	DIAMETRAL PITCH						
	32	48	64	72	80	96	120
18	0.5625	0.3750	0.2812	0.2500	0.2250	0.1875	0.1500
19	0.5937	0.3958	0.2969	0.2639	0.2375	0.1979	0.1583
20	0.6250	0.4167	0.3125	0.2778	0.2500	0.2083	0.1667
21	0.6562	0.4375	0.3281	0.2917	0.2625	0.2187	0.1750
22	0.6875	0.4583	0.3437	0.3056	0.2750	0.2292	0.1833
23	0.7187	0.4792	0.3594	0.3194	0.2875	0.2396	0.1917
24	0.7500	0.5000	0.3750	0.3333	0.3000	0.2500	0.2000
25	0.7812	0.5208	0.3906	0.3472	0.3125	0.2604	0.2083
26	0.8125	0.5417	0.4062	0.3611	0.3250	0.2708	0.2167
27	0.8437	0.5625	0.4219	0.3750	0.3375	0.2812	0.2250
28	0.8750	0.5833	0.4375	0.3889	0.3500	0.2917	0.2333
29	0.9062	0.6042	0.4531	0.4028	0.3625	0.3021	0.2417
30	0.9375	0.6250	0.4687	0.4167	0.3750	0.3125	0.2500
31	0.9687	0.6458	0.4844	0.4306	0.3875	0.3229	0.2583
32	1.0000	0.6667	0.5000	0.4444	0.4000	0.3333	0.2667
33	1.0312	0.6875	0.5156	0.4583	0.4125	0.3437	0.2750
34	1.0625	0.7083	0.5312	0.4722	0.4250	0.3542	0.2833
35	1.0937	0.7292	0.5469	0.4861	0.4375	0.3646	0.2917
36	1.1250	0.7500	0.5625	0.5000	0.4500	0.3750	0.3000
37	1.1562	0.7708	0.5781	0.5139	0.4625	0.3854	0.3083
38	1.1875	0.7917	0.5937	0.5278	0.4750	0.3958	0.3167
39	1.2187	0.8125	0.6094	0.5417	0.4875	0.4062	0.3250
40	1.2500	0.8333	0.6250	0.5556	0.5000	0.4167	0.3333
41	1.2812	0.8542	0.6406	0.5694	0.5125	0.4271	0.3417
42	1.3125	0.8750	0.6562	0.5833	0.5250	0.4375	0.3500
43	1.3437	0.8958	0.6719	0.5972	0.5375	0.4479	0.3583
44	1.3750	0.9167	0.6875	0.6111	0.5500	0.4583	0.3667
45	1.4062	0.9375	0.7031	0.6250	0.5625	0.4687	0.3750
46	1.4375	0.9583	0.7187	0.6389	0.5750	0.4792	0.3833
47	1.4687	0.9792	0.7344	0.6528	0.5875	0.4896	0.3917
48	1.5000	1.0000	0.7500	0.6667	0.6000	0.5000	0.4000
49	1.5312	1.0208	0.7656	0.6806	0.6125	0.5104	0.4083
50	1.5625	1.0417	0.7812	0.6944	0.6250	0.5208	0.4167
51	1.5937	1.0625	0.7969	0.7083	0.6375	0.5312	0.4250
52	1.6250	1.0833	0.8125	0.7222	0.6500	0.5417	0.4333
53	1.6562	1.1042	0.8281	0.7361	0.6625	0.5521	0.4417
54	1.6875	1.1250	0.8437	0.7500	0.6750	0.5625	0.4500
55	1.7187	1.1458	0.8594	0.7639	0.6875	0.5729	0.4583
56	1.7500	1.1667	0.8750	0.7778	0.7000	0.5833	0.4667
57	1.7812	1.1875	0.8906	0.7917	0.7125	0.5937	0.4750
58	1.8125	1.2083	0.9062	0.8056	0.7250	0.6042	0.4833
59	1.8437	1.2292	0.9219	0.8194	0.7375	0.6146	0.4917
60	1.8750	1.2500	0.9375	0.8333	0.7500	0.6250	0.5000
61	1.9062	1.2708	0.9531	0.8472	0.7625	0.6354	0.5083
62	1.9375	1.2917	0.9687	0.8611	0.7750	0.6458	0.5167
63	1.9687	1.3125	0.9844	0.8750	0.7875	0.6562	0.5250
64	2.0000	1.3333	1.0000	0.8889	0.8000	0.6667	0.5333
65	2.0312	1.3542	1.0156	0.9028	0.8125	0.6771	0.5417
66	2.0625	1.3750	1.0312	0.9167	0.8250	0.6875	0.5500
67	2.0937	1.3958	1.0469	0.9306	0.8375	0.6979	0.5583
68	2.1250	1.4167	1.0625	0.9444	0.8500	0.7083	0.5667
69	2.1562	1.4375	1.0781	0.9583	0.8625	0.7187	0.5750
70	2.1875	1.4583	1.0937	0.9722	0.8750	0.7292	0.5833
71	2.2187	1.4792	1.1094	0.9861	0.8875	0.7396	0.5917
72	2.2500	1.5000	1.1250	1.0000	0.9000	0.7500	0.6000
73	2.2812	1.5208	1.1406	1.0139	0.9125	0.7604	0.6083
74	2.3125	1.5417	1.1562	1.0278	0.9250	0.7708	0.6167
75	2.3437	1.5625	1.1719	1.0417	0.9375	0.7812	0.6250
76	2.3750	1.5833	1.1875	1.0556	0.9500	0.7917	0.6333
77	2.4062	1.6042	1.2031	1.0694	0.9625	0.8021	0.6417
78	2.4375	1.6250	1.2187	1.0833	0.9750	0.8125	0.6500
79	2.4687	1.6458	1.2344	1.0972	0.9875	0.8229	0.6583
80	2.5000	1.6667	1.2500	1.1111	1.0000	0.8333	0.6667

	DIAMETRAL PITCH						
	32	48	64	72	80	96	120
81	2.5312	1.6875	1.2656	1.1250	1.0125	0.8437	0.6750
82	2.5625	1.7083	1.2812	1.1389	1.0250	0.8542	0.6833
83	2.5937	1.7292	1.2969	1.1528	1.0375	0.8646	0.6917
84	2.6250	1.7500	1.3125	1.1667	1.0500	0.8750	0.7000
85	2.6562	1.7708	1.3281	1.1806	1.0625	0.8854	0.7083
86	2.6875	1.7917	1.3437	1.1944	1.0750	0.8958	0.7167
87	2.7187	1.8125	1.3594	1.2083	1.0875	0.9062	0.7250
88	2.7500	1.8333	1.3750	1.2222	1.1000	0.9167	0.7333
89	2.7812	1.8542	1.3906	1.2361	1.1125	0.9271	0.7417
90	2.8125	1.8750	1.4062	1.2500	1.1250	0.9375	0.7500
91	2.8437	1.8958	1.4219	1.2639	1.1375	0.9479	0.7583
92	2.8750	1.9167	1.4375	1.2778	1.1500	0.9583	0.7667
93	2.9062	1.9375	1.4531	1.2917	1.1625	0.9687	0.7750
94	2.9375	1.9583	1.4687	1.3056	1.1750	0.9792	0.7833
95	2.9687	1.9792	1.4844	1.3194	1.1875	0.9896	0.7917
96	3.0000	2.0000	1.5000	1.3333	1.2000	1.0000	0.8000
97	3.0312	2.0208	1.5156	1.3472	1.2125	1.0104	0.8083
98	3.0625	2.0417	1.5312	1.3611	1.2250	1.0208	0.8167
99	3.0937	2.0625	1.5469	1.3750	1.2375	1.0312	0.8250
100	3.1250	2.0833	1.5625	1.3889	1.2500	1.0417	0.8333
101	3.1562	2.1042	1.5781	1.4028	1.2625	1.0521	0.8417
102	3.1875	2.1250	1.5937	1.4167	1.2750	1.0625	0.8500
103	3.2187	2.1458	1.6094	1.4306	1.2875	1.0729	0.8583
104	3.2500	2.1667	1.6250	1.4444	1.3000	1.0833	0.8667
105	3.2812	2.1875	1.6406	1.4583	1.3125	1.0937	0.8750
106	3.3125	2.2083	1.6562	1.4722	1.3250	1.1042	0.8833
107	3.3437	2.2292	1.6719	1.4861	1.3375	1.1146	0.8917
108	3.3750	2.2500	1.6875	1.5000	1.3500	1.1250	0.9000
109	3.4062	2.2708	1.7031	1.5139	1.3625	1.1354	0.9083
110	3.4375	2.2917	1.7187	1.5278	1.3750	1.1458	0.9167
111	3.4687	2.3125	1.7344	1.5417	1.3875	1.1562	0.9250
112	3.5000	2.3333	1.7500	1.5556	1.4000	1.1667	0.9333
113	3.5312	2.3542	1.7656	1.5694	1.4125	1.1771	0.9417
114	3.5625	2.3750	1.7812	1.5833	1.4250	1.1875	0.9500
115	3.5937	2.3958	1.7969	1.5972	1.4375	1.1979	0.9583
116	3.6250	2.4167	1.8125	1.6111	1.4500	1.2083	0.9667
117	3.6562	2.4375	1.8281	1.6250	1.4625	1.2187	0.9750
118	3.6875	2.4583	1.8437	1.6389	1.4750	1.2292	0.9833
119	3.7187	2.4792	1.8594	1.6528	1.4875	1.2396	0.9917
120	3.7500	2.5000	1.8750	1.6667	1.5000	1.2500	1.0000
121	3.7812	2.5208	1.8906	1.6806	1.5125	1.2604	1.0083
122	3.8125	2.5417	1.9062	1.6944	1.5250	1.2708	1.0167
123	3.8437	2.5625	1.9219	1.7083	1.5375	1.2812	1.0250
124	3.8750	2.5833	1.9375	1.7222	1.5500	1.2917	1.0333
125	3.9062	2.6042	1.9531	1.7361	1.5625	1.3021	1.0417
126	3.9375	2.6250	1.9687	1.7500	1.5750	1.3125	1.0500
127	3.9687	2.6458	1.9844	1.7639	1.5875	1.3229	1.0583
128	4.0000	2.6667	2.0000	1.7778	1.6000	1.3333	1.0667
129	4.0312	2.6875	2.0156	1.7917	1.6125	1.3437	1.0750
130	4.0625	2.7083	2.0312	1.8056	1.6250	1.3542	1.0833
131	4.0937	2.7292	2.0469	1.8194	1.6375	1.3646	1.0917
132	4.1250	2.7500	2.0625	1.8333	1.6500	1.3750	1.1000
133	4.1562	2.7708	2.0781	1.8472	1.6625	1.3854	1.1083
134	4.1875	2.7917	2.0937	1.8611	1.6750	1.3958	1.1167
135	4.2187	2.8125	2.1094	1.8750	1.6875	1.4062	1.1250
136	4.2500	2.8333	2.1250	1.8889	1.7000	1.4167	1.1333
137	4.2812	2.8542	2.1406	1.9028	1.7125	1.4271	1.1417
138	4.3125	2.8750	2.1562	1.9167	1.7250	1.4375	1.1500
139	4.3437	2.8958	2.1719	1.9306	1.7375	1.4479	1.1583
140	4.3750	2.9167	2.1875	1.9444	1.7500	1.4583	1.1667
141	4.4062	2.9375	2.2031	1.9583	1.7625	1.4687	1.1750
142	4.4375	2.9583	2.2187	1.9722	1.7750	1.4792	1.1833
143	4.4687	2.9792	2.2344	1.9861	1.7875	1.4896	1.1917

	DIAMETRAL PITCH						
	32	48	64	72	80	96	120
144	4.5000	3.0000	2.2500	2.0000	1.8000	1.5000	1.2000
145	4.5312	3.0208	2.2656	2.0139	1.8125	1.5104	1.2083
146	4.5625	3.0417	2.2812	2.0278	1.8250	1.5208	1.2167
147	4.5937	3.0625	2.2969	2.0417</			



# SPUR GEAR INDEX

## INCH SPUR GEAR INDEX

Diametral Pitch	Face Width	Bore inches	Hub Style	Series Number	Page Number
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20	3/8	3/8	Pin	G77 & G78	12-6
1/10 <sup>th</sup> Cir. Pitch	3/16	1/4	Pin	G75	12-6
	1/4			G83	
24	1/8	1/4	Split	H23 & H24	12-7
		3/8	Hubless	J21 & J22	12-7
		1/4	Pin	24T	12-8
	3/16	3/16	Pin	G57 & G58	12-9
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	3/8	3/8	Pin	G79 & G80	12-9
32	1/8	3/16	Split	32HT	12-10
		1/4	Pin	32T	12-11
		1/4	Split	H25 & H26	12-12
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		1/4		G43 & G44	12-13
	3/8	3/8	Pin	G81 & G82	12-13
	48	1/8	1/8	Pin	G61 & G62
Split				H55 & H56	12-15
3/16			Pin	G1 & G2	12-14
			Split	H57 & H58	12-15
1/4			Pin	G3 & G4	12-14
			Split	H1 & H2	12-15
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1/4			G7 & G8		

## METRIC SPUR GEAR INDEX

Module	Face Width (MM)	Bore (MM)	Hub Style	Series Number	Page Number
.25	1.58	9.525	Hubless	MHS1 & MHS2	12-54
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	3.18		Split	MSG35 & MSG36	
.30	3.18	3	Pin	MSG5 & MSG6	12-55
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		9.525	Hubless	MHS3 & MHS4	
.40	3.18	3	Pin	MSG7 & MSG8	12-56
		4	Pin	MSG9 & MSG10	12-56
			Split	MSG39 & MSG40	12-58
			Pin	MSG11 & MSG12	12-57
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	9.525	Hubless	MHS5 & MHS6	12-58	
4.76	6	Pin	MSG13 & MSG16	12-57	
.50	3.18	3	Pin	MSG15 & MSG16	12-59
			Pin	MSG17 & MSG18	12-59
		4	Split	MSG43 & MSG44	12-61
			Pin	MSG19 & MSG20	12-60
		6	Split	MSG45 & MSG46	12-61
	9.525		Hubless	MHS7 & MHS8	12-61
4.76	6	Pin	MSG21 & MSG22	12-60	
.60	4.76	6	Pin	MSG23 & MSG22	12-62
.70	4.76	6	Pin	MSG25 & MSG26	12-63
.80	3.18	6	Split	MSG47 & MSG48	12-64
		9.52	Hubless	MHS9 & MHS10	
	4.76	6	Pin	MSG27 & MSG28	
9.52	10	Pin	MSG29 & MSG30	12-65	
1.0	3.18	6	Split	MSG49 & MSG50	12-66
		9.52	Hubless	MHS11 & MHS12	
	4.76	6	Pin	MSG31 & MSG34	12-66
9.52	10	Pin	MSG33 & MSG34	12-65	

## INCH SPUR GEAR INDEX

Diametral Pitch	Face Width	Bore inches	Hub Style	Series Number	Page Number
64	1/8	1/8	Pin	G9 & G10	12-17
		3/16		G11 & G12	
		1/4		G13 & G14	
		1/8	Split	H47 & H48	12-19
		3/16		H3 & H4	
		1/4		H49 & H50	
	3/8	Hubless	J3 & J4		
	3/16	3/16	Pin	G15 & G16	12-18
		1/4	Pin	G17 & G18	12-18
	72	1/8	1/8	Pin	G19 & G20
3/16			G21 & G22		
3/16			Split	H5 & H6	12-21
				1/4	
3/8		Hubless	J5 & J6	12-22	
			3/16		G23 & G24
1/4		Pin	G25 & G26		
80		1/8	1/8	Pin	G45 & G46
	3/16		G47 & G48		
	1/4		80T	12-24	
	3/8		Hubless	J25 & J26	12-23
96	1/16	1/8	Pin	G51 & G52	12-25
		3/8	Hubless	J27 & J28	12-26
	3/32	1/8	Pin	G27 & G28	12-25
	1/8	1/8	Split	H7 & H8	12-26
	1/8	3/8	Hubless	J7 & J8	12-26
120	1/16	1/8	Pin	G55 & G56	12-27
	3/32			G35 & G36	
	1/8	3/8	Hubless	J9 & J10	12-27

**Odd Series:** Stainless Steel

**Even Series:** Aluminum

\*Bronze instead of Aluminum

## GEAR MATERIALS

Materials stated on the gear drawings are the commonly referred to designations (303, 2024-T4). This provides the designer with a ready reference for properties such as corrosion resistance, weight, yield and tensile strength. Detailed specifications are summarized in the following table.

Catalog Part Designation	Aluminum	Stainless Steel
Spur, Helical, Bevel & Worm: CO, CN, F, G, H, J	2024-T4/T351 (Bar)	303 (Bar)
MHS, MSG, Q (2, 4, 6, 8, 10, 12)		
Racks: AG	2024-T4 (Bar)	416
Anti-backlash: P (2, 3, 4, 12, 13, 14, 22, 24, 26) P (20, 30, 40)	2024-T3 (Sheet) 2024-T4/T351 (Bar)	
P (5, 6, 7, 15, 16, 17, 21, 23, 25) P (50, 60, 70)		303 (Sheet) 303 (Bar)

For Delrin, See Pages 12-31 through 12-34

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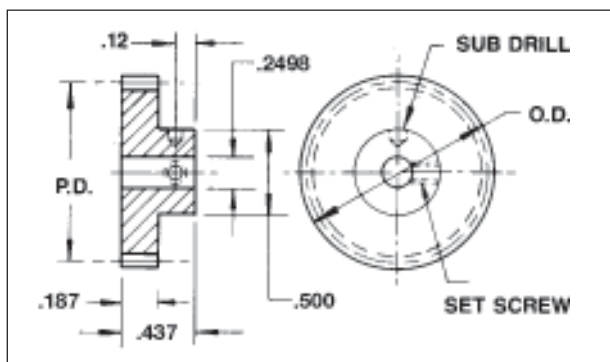
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# SPUR GEAR-16 PITCH — $\frac{3}{16}$ " Face Width ■ 20° Pressure Angle

Pin Hub —  $\frac{1}{4}$ " Bore



Material: 303 Stainless Steel  
2024-T4 Aluminum  
(Anodized Before Cutting)

Tolerances	Q10	Q12	Q14
<b>Bore</b>	+ .0005 - .0000	+ .0003 - .0000	+ .0002 - .0000
<b>Pitch Diameter</b>	+ .000 - .001	+ .0000 - .0007	+ .0000 - .0005
<b>Outside Diameter</b>	+ .000 - .002	+ .0000 - .0015	+ .000 - .001
<b>Total Composite Tolerance</b>	FOR AGMA QUALITY STANDARDS SEE PAGE 12-2		
<b>Tooth to Tooth Tolerance</b>			

To order AGMA 12 Gears, add - Q12 to Part No.  
To order AGMA 14 Gears, add - Q14 to Part No.

Gear Data			Stainless Steel	Aluminum
No. Teeth	P.D.	O.D.	Part No.	Part No.
11	0.6875	0.813	16T11S	16T11A
12	0.7500	0.875	16T12S	16T12A
13	0.8125	0.938	16T13S	16T13A
14	0.8750	1.000	16T14S	16T14A
15	0.9375	1.063	16T15S	16T15A
16	1.0000	1.125	16T16S	16T16A
17	1.0625	1.188	16T17S	16T17A
18	1.1250	1.250	16T18S	16T18A
19	1.1875	1.313	16T19S	16T19A
20	1.2500	1.375	16T20S	16T20A
21	1.3125	1.438	16T21S	16T21A
22	1.3750	1.500	16T22S	16T22A
23	1.4375	1.563	16T23S	16T23A
24	1.5000	1.625	16T24S	16T24A
27	1.6875	1.813	16T27S	16T27A
30	1.8750	2.000	16T30S	16T30A
32	2.0000	2.125	16T32S	16T32A
34	2.1250	2.250	16T34S	16T34A
38	2.3750	2.500	16T38S	16T38A
40	2.5000	2.625	16T40S	16T40A
44	2.7500	2.875	16T44S	16T44A
46	2.8750	3.000	16T46S	16T46A
48	3.0000	3.125	16T48S	16T48A
52	3.2500	3.375	16T52S	16T52A
54	3.3750	3.500	16T54S	16T54A
56	3.5000	3.625	16T56S	16T56A
58	3.6250	3.750	16T58S	16T58A
60	3.7500	3.875	16T60S	16T60A
62	3.8750	4.000	16T62S	16T62A
64	4.0000	4.125	16T64S	16T64A
65	4.0625	4.188	16T65S	16T65A

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

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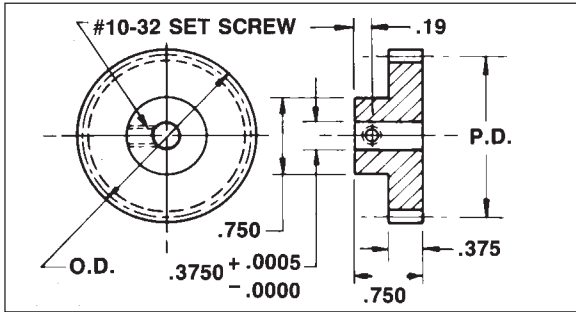
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# SPUR GEAR-20 PITCH — 3/8" Face Width ■ 20° Pressure Angle

Pin Hub — 3/8" Bore



For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

AGMA Quality Number 10-C	Tooth-to-Tooth Composite	Total Composite
Up to 20 Teeth Inclusive	.0007	.0010
Over 20 Teeth—up to 1.999" P.D.	.0005	.0010
Over 20 Teeth—2" to 2.999" P.D.	.0005	.0012
Over 20 Teeth—4" P.D. and over	.0005	.0014

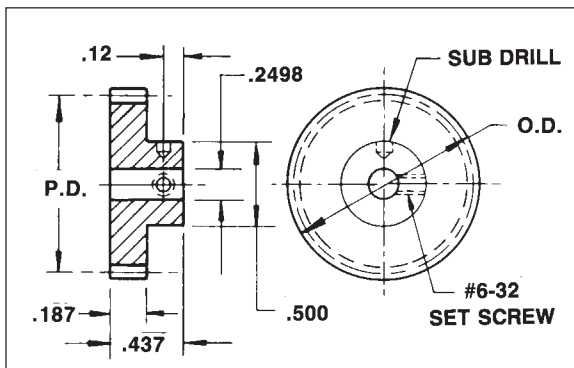
"C"—BACKLASH DESIGNATION.

Provides .0005 to .001 tooth thinning at pitch line. Allows operation on theoretical centers.

Gear Data			#303 STAINLESS STEEL	BRONZE Alloy 464
No. Teeth	P.D.	O.D.	Part No.	Part No.
18	.9000	1.000	G77-18	G78-18
20	1.0000	1.100	G77-20	G78-20
24	1.2000	1.300	G77-24	G78-24
28	1.4000	1.500	G77-28	G78-28
30	1.5000	1.600	G77-30	G78-30
36	1.8000	1.900	G77-36	G78-36
40	2.0000	2.100	G77-40	G78-40
48	2.4000	2.500	G77-48	G78-48
56	2.8000	2.900	G77-56	G78-56
60	3.0000	3.100	G77-60	G78-60
72	3.6000	3.700	G77-72	G78-72
80	4.0000	4.100	G77-80	G78-80
84	4.2000	4.300	G77-84	G78-84
96	4.8000	4.900	G77-96	G78-96
100	5.0000	5.100	G77-100	G78-100

# SPUR GEAR 1/10<sup>th</sup> CIR. PITCH — 3/16" Face Width ■ 20° Pressure Angle

Pin Hub — 1/4" Bore



Tolerances	Q10	Q12	Q14
<b>Bore</b>	+ .0005 - .0000	+ .0003 - .0000	+ .0002 - .0000
<b>Pitch Diameter</b>	+ .000 - .001	+ .0000 - .0007	+ .0000 - .0005
<b>Outside Diameter</b>	+ .000 - .002	+ .0000 - .0015	+ .000 - .001
<b>Total Composite Tolerance</b>	FOR AGMA QUALITY STANDARDS SEE PAGE 12-2		
<b>Tooth to Tooth Tolerance</b>	FOR AGMA QUALITY STANDARDS SEE PAGE 12-2		

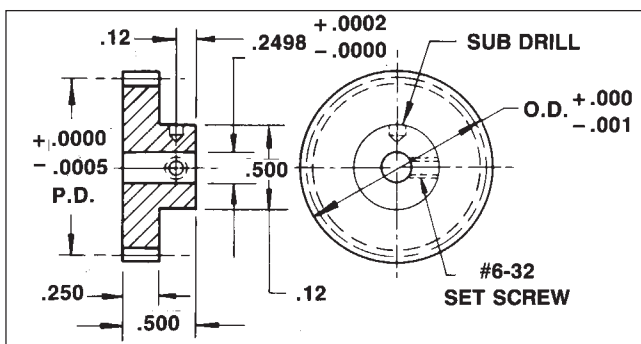
Material: 303 Stainless Steel

No. Teeth	P.D.	O.D.	Part No.
20	.6366	.700	G75-20
40	1.2732	1.337	G75-40

To order AGMA 13 Gears, add Q13 to Cat. No.

# SPUR GEAR 1/10<sup>th</sup> CIR. PITCH — 1/4" Face Width ■ 20° Pressure Angle

AGMA Quality No. 13 ■ Pin Hub — 1/4" Bore



AGMA Quality No. 13	Tooth-to-Tooth Composite	Total Composite
20 Teeth	.0003	.0004
40 Teeth	.0002	.0004

Material: Stainless Steel 17-4PH  
Heat Treated to RC42 Minimum

No. Teeth	P.D.	O.D.	Part No.
20	.6366	.700	G83-20
40	1.2732	1.337	G83-40

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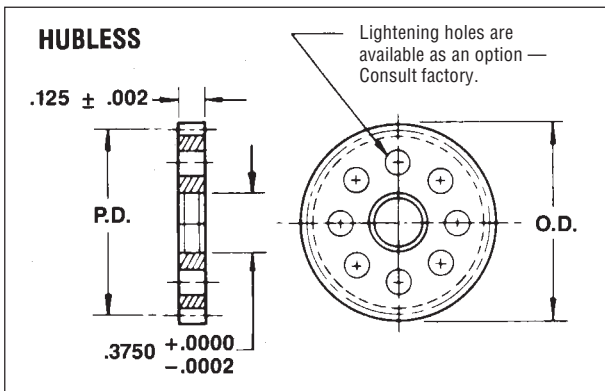
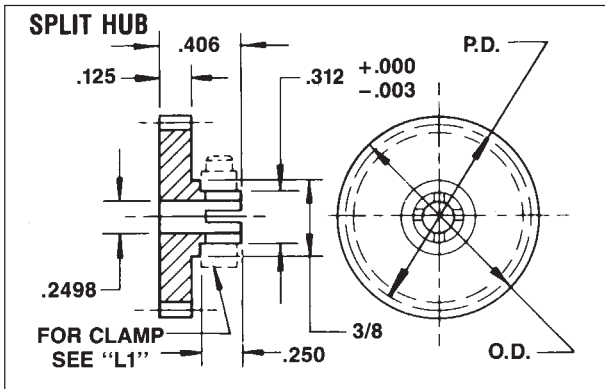
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# SPUR GEAR-24 PITCH — 1/8" Face Width ■ 20° Pressure Angle

Split Hub - 1/4" Bores — Hubless 3/8" Bore



Material: 303 Stainless Steel  
2024-T4 Aluminum  
(Anodized Before Cutting)

Gear Data			Stainless Steel Part No.		Aluminum Part No.	
No. Teeth	P.D.	O.D.	Split Hub	Hubless	Split Hub	Hubless
12	.5000	.583	H23-12	—	H24-12	—
13	.5418	.625	H23-13	—	H24-13	—
14	.5833	.667	H23-14	—	H24-14	—
15	.6250	.708	H23-15	J21-15	H24-15	J22-15
16	.6667	.750	H23-16	J21-16	H24-16	J22-16
17	.7083	.792	H23-17	J21-17	H24-17	J22-17
18	.7500	.833	H23-18	J21-18	H24-18	J22-18
19	.7917	.875	H23-19	J21-19	H24-19	J22-19
20	.8333	.917	H23-20	J21-20	H24-20	J22-20
21	.8750	.958	H23-21	J21-21	H24-21	J22-21
22	.9167	1.000	H23-22	J21-22	H24-22	J22-22
23	.9583	1.042	H23-23	J21-23	H24-23	J22-23
24	1.0000	1.083	H23-24	J21-24	H24-24	J22-24
27	1.1250	1.208	H23-27	J21-27	H24-27	J22-27
30	1.2500	1.333	H23-30	J21-30	H24-30	J22-30
33	1.3750	1.458	H23-33	J21-33	H24-33	J22-33
36	1.5000	1.583	H23-36	J21-36	H24-36	J22-36
39	1.6250	1.708	H23-39	J21-39	H24-39	J22-39
42	1.7500	1.833	H23-42	J21-42	H24-42	J22-42
45	1.8750	1.958	H23-45	J21-45	H24-45	J22-45
48	2.0000	2.083	H23-48	J21-48	H24-48	J22-48
51	2.1250	2.208	H23-51	J21-51	H24-51	J22-51
54	2.2500	2.333	H23-54	J21-54	H24-54	J22-54
57	2.3750	2.458	H23-57	J21-57	H24-57	J22-57
60	2.5000	2.583	H23-60	J21-60	H24-60	J22-60
72	3.000	3.083	—	J21-72	—	J22-72
78	3.2500	3.333	—	J21-78	—	J22-78
84	3.5000	3.583	—	J21-84	—	J22-84
90	3.7500	3.833	—	J21-90	—	J22-90
96	4.0000	4.083	—	J21-96	—	J22-96
99	4.1250	4.208	—	J21-99	—	J22-99

Other Size Bores Available, Consult Factory.

For Gear Hubs See Pages 12-67 & 12-68

Tolerances	Q10	Q12	Q14
<b>Bore</b>	+ .0005 - .0000	+ .0003 - .0000	+ .0002 - .0000
<b>Pitch Diameter</b>	+ .000 - .001	+ .0000 - .0007	+ .0000 - .0005
<b>Outside Diameter</b>	+ .000 - .002	+ .0000 - .0015	+ .000 - .001
<b>Total Composite Tolerance</b>	FOR AGMA QUALITY STANDARDS		
<b>Tooth to Tooth Tolerance</b>	SEE PAGE 12-2		

To order AGMA 12 Gears, add — Q12 to Part No.

To order AGMA 14 Gears, add — Q14 to Part No.

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

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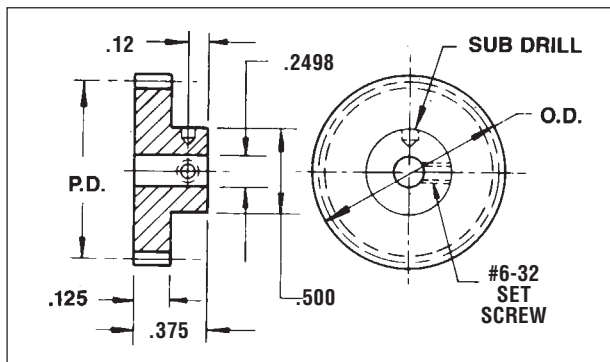
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# SPUR GEAR-24 PITCH — 1/8" Face Width ■ 20° Pressure Angle

Pin Hub — 1/4" Bore



Material: 303 Stainless Steel  
2024-T4 Aluminum  
(Anodized Before Cutting)

Tolerances	Q10	Q12	Q14
<b>Bore</b>	+ .0005 - .0000	+ .0003 - .0000	+ .0002 - .0000
<b>Pitch Diameter</b>	+ .000 - .001	+ .0000 - .0007	+ .0000 - .0005
<b>Outside Diameter</b>	+ .000 - .002	+ .0000 - .0015	+ .000 - .001
<b>Total Composite Tolerance</b>	FOR AGMA QUALITY STANDARDS SEE PAGE 12-2		
<b>Tooth to Tooth Tolerance</b>			

To order AGMA 12 Gears, add - Q12 to Part No.  
To order AGMA 14 Gears, add - Q14 to Part No.

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

Gear Data			Stainless Steel	Aluminum
No. Teeth	P.D.	O.D.	Part No.	Part No.
*12	0.5000	0.583	24T12S	24T12A
*13	0.5417	0.625	24T13S	24T13A
*14	0.5833	0.667	24T14S	24T14A
*15	0.6250	0.708	24T15S	24T15A
16	0.6667	0.750	24T16S	24T16A
17	0.7083	0.792	24T17S	24T17A
18	0.7500	0.833	24T18S	24T18A
19	0.7917	0.875	24T19S	24T19A
20	0.8333	0.917	24T20S	24T20A
21	0.8750	0.958	24T21S	24T21A
22	0.9167	1.000	24T22S	24T22A
23	0.9583	1.042	24T23S	24T23A
24	1.0000	1.083	24T24S	24T24A
25	1.0417	1.125	24T25S	24T25A
30	1.2500	1.333	24T30S	24T30A
33	1.3750	1.458	24T33S	24T33A
36	1.5000	1.583	24T36S	24T36A
39	1.6250	1.708	24T39S	24T39A
42	1.7500	1.833	24T42S	24T42A
45	1.8750	1.958	24T45S	24T45A
48	2.0000	2.083	24T48S	24T48A
51	2.1250	2.208	24T51S	24T51A
54	2.2500	2.333	24T54S	24T54A
57	2.3750	2.458	24T57S	24T57A
60	2.5000	2.583	24T60S	24T60A
63	2.6250	2.708	24T63S	24T63A
66	2.7500	2.833	24T66S	24T66A
69	2.8750	2.958	24T69S	24T69A
72	3.0000	3.083	24T72S	24T72A
78	3.2500	3.333	24T78S	24T78A
84	3.5000	3.583	24T84S	24T84A
90	3.7500	3.833	24T90S	24T90A
96	4.0000	4.083	24T96S	24T96A
99	4.1250	4.208	24T99S	24T99A

Other Size Bores Available, Consult Factory  
\* Hob cuts into Hub

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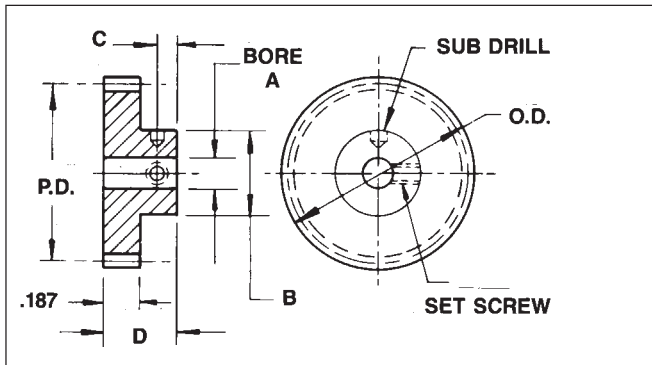
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# SPUR GEAR-24 PITCH — $\frac{3}{16}$ " Face Width ■ 20° Pressure Angle

Pin Hub —  $\frac{3}{16}$ ",  $\frac{1}{4}$ " Bores



Material: 303 Stainless Steel  
2024-T4 Aluminum  
(Anodized Before Cutting)

Dimen.	Bore	
	3/16	1/4
A	.1873	.2498
B	.375	.500
C	.11	.12
D	.406	.437
Set Screw	#4-40	#6-32

Tolerances	Q10	Q12	Q14
<b>Bore</b>	+ .0005 - .0000	+ .0003 - .0000	+ .0002 - .0000
<b>Pitch Diameter</b>	+ .000 - .001	+ .0000 - .0007	+ .0000 - .0005
<b>Outside Diameter</b>	+ .000 - .002	+ .0000 - .0015	+ .000 - .001
<b>Total Composite Tolerance</b>	FOR AGMA QUALITY STANDARDS SEE PAGE 12-2		
<b>Tooth to Tooth Tolerance</b>	FOR AGMA QUALITY STANDARDS SEE PAGE 12-2		

To order AGMA 12 Gears, add - Q12 to Part No.  
To order AGMA 14 Gears, add - Q14 to Part No.

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

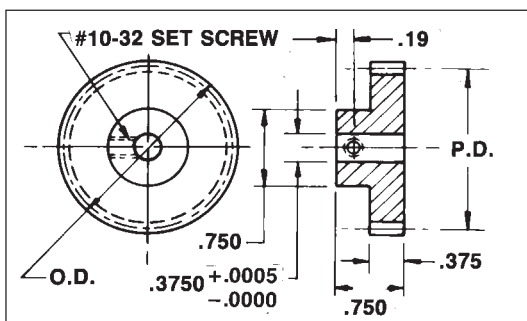
Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

Gear Data			Stainless Steel Part No. Bore Size		Aluminum Part No. Bore Size	
No. Teeth	P.D.	O.D.	.1873	.2498	.1873	.2498
12	5000	583	G57-12	—	G58-12	—
13	5418	625	G57-13	—	G58-13	—
14	5833	667	G57-14	—	G58-14	—
15	6250	.708	G57-15	G41-15	G58-15	G42-15
16	6667	.750	G57-16	G41-16	G58-16	G42-16
18	.7500	.833	G57-18	G41-18	G58-18	G42-18
20	.8333	.917	G57-20	G41-20	G58-20	G42-20
22	.9167	1.000	G57-22	G41-22	G58-22	G42-22
24	1.0000	1.083	G57-24	G41-24	G58-24	G42-24
27	1.1250	1.208	G57-27	G41-27	G58-27	G42-27
30	1.2500	1.333	G57-30	G41-30	G58-30	G42-30
36	1.5000	1.583	G57-36	G41-36	G58-36	G42-36
39	1.6250	1.708	G57-39	G41-39	G58-39	G42-39
42	1.7500	1.833	G57-42	G41-42	G58-42	G42-42
45	1.8750	1.958	G57-45	G41-45	G58-45	G42-45
48	2.0000	2.083	G57-48	G41-48	G58-48	G42-48
54	2.2500	2.333	G57-54	G41-54	G58-54	G42-54
60	2.5000	2.583	G57-60	G41-60	G58-60	G42-60
63	2.6250	2.708	G57-63	G41-63	G58-63	G42-63
66	2.7500	2.833	G57-66	G41-66	G58-66	G42-66
69	2.8750	2.958	G57-69	G41-69	G58-69	G42-69
72	3.000	3.083	G57-72	G41-72	G58-72	G42-72
75	3.1250	3.208	G57-75	G41-75	G58-75	G42-75
78	3.2500	3.333	—	G41-78	—	G42-78
81	3.3750	3.458	—	G41-81	—	G42-81
84	3.5000	3.583	—	G41-84	—	G42-84
87	3.6250	3.708	—	G41-87	—	G42-87
90	3.7500	3.833	—	G41-90	—	G42-90
93	3.8750	3.958	—	G41-93	—	G42-93
96	4.0000	4.083	—	G41-96	—	G42-96
99	4.1250	4.208	—	G41-99	—	G42-99

Other Size Bores Available, Consult Factory.

# SPUR GEAR-24 PITCH — $\frac{3}{8}$ " Face Width ■ 20° Pressure Angle

Pin Hub —  $\frac{3}{8}$ " Bore



For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

## TOLERANCES

AGMA Quality Number 10-C	Tooth-to-Tooth Composite	Total Composite
Up to 20 Teeth Inclusive	.0007	.0010
Over 20 Teeth—up to 1.999" P.D.	.0005	.0010
Over 20 Teeth—2" to 2.999" P.D.	.0005	.0012
Over 20 Teeth—4" P.D. and over	.0005	.0014

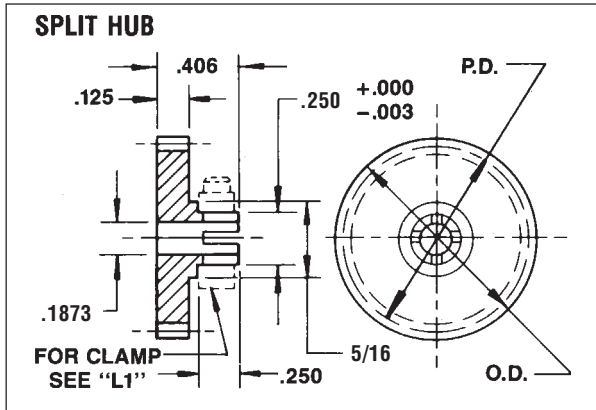
Gear Data			#303 STAINLESS STEEL	BRONZE Alloy 464
No. Teeth	P.D.	O.D.	Part No.	Part No.
24	1.0000	1.083	G79-24	G80-24
28	1.1667	1.250	G79-28	G80-28
30	1.2500	1.333	G79-30	G80-30
36	1.5000	1.583	G79-36	G80-36
40	1.6667	1.750	G79-40	G80-40
48	2.0000	2.083	G79-48	G80-48
56	2.3333	2.417	G79-56	G80-56
60	2.5000	2.583	G79-60	G80-60
72	3.0000	3.083	G79-72	G80-72
80	3.3333	3.417	G79-80	G80-80
96	4.0000	4.083	G79-96	G80-96
112	4.6667	4.750	G79-112	G80-112
120	5.0000	5.083	G79-120	G80-120

"C"—BACKLASH DESIGNATION.

Provides .0005 to .001 tooth thinning at pitch line. Allows operation on theoretical centers.

# SPUR GEAR-32 PITCH — 1/8" Face Width ■ 20° Pressure Angle

Split Hub - 3/16" Bore



Material: 303 Stainless Steel  
2024-T4 Aluminum  
(Anodized Before Cutting)

Tolerances	Q10	Q12	Q14
<b>Bore</b>	+ .0005 - .0000	+ .0003 - .0000	+ .0002 - .0000
<b>Pitch Diameter</b>	+ .000 - .001	+ .0000 - .0007	+ .0000 - .0005
<b>Outside Diameter</b>	+ .000 - .002	+ .0000 - .0015	+ .000 - .001
<b>Total Composite Tolerance</b>	FOR AGMA QUALITY STANDARDS		
<b>Tooth to Tooth Tolerance</b>	SEE PAGE 12-2		

To order AGMA 12 Gears, add - Q12 to Part No.  
To order AGMA 14 Gears, add - Q14 to Part No.

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

Gear Data			Stainless Steel	Aluminum
No. Teeth	P.D.	O.D.	Part No.	Part No.
14	0.4375	0.500	32HT14S	32HT14A
15	0.4688	0.531	32HT15S	32HT15A
16	0.5000	0.563	32HT16S	32HT16A
17	0.5313	0.594	32HT17S	32HT17A
18	0.5625	0.625	32HT18S	32HT18A
19	0.5938	0.656	32HT19S	32HT19A
20	0.6250	0.688	32HT20S	32HT20A
21	0.6563	0.719	32HT21S	32HT21A
22	0.6875	0.750	32HT22S	32HT22A
23	0.7188	0.781	32HT23S	32HT23A
24	0.7500	0.813	32HT24S	32HT24A
25	0.7813	0.844	32HT25S	32HT25A
28	0.8750	0.938	32HT28S	32HT28A
30	0.9375	1.000	32HT30S	32HT30A
32	1.0000	1.063	32HT32S	32HT32A
33	1.0313	1.094	32HT33S	32HT33A
36	1.1250	1.188	32HT36S	32HT36A
39	1.2188	1.281	32HT39S	32HT39A
40	1.2500	1.313	32HT40S	32HT40A
42	1.3125	1.375	32HT42S	32HT42A
45	1.4063	1.469	32HT45S	32HT45A
48	1.5000	1.563	32HT48S	32HT48A
51	1.5938	1.656	32HT51S	32HT51A
54	1.6875	1.750	32HT54S	32HT54A
56	1.7500	1.813	32HT56S	32HT56A
60	1.8750	1.938	32HT60S	32HT60A
63	1.9688	2.031	32HT63S	32HT63A
64	2.0000	2.063	32HT64S	32HT64A
66	2.0625	2.125	32HT66S	32HT66A
69	2.1563	2.219	32HT69S	32HT69A
72	2.2500	2.313	32HT72S	32HT72A
78	2.4375	2.500	32HT78S	32HT78A
80	2.5000	2.563	32HT80S	32HT80A
84	2.6250	2.688	32HT84S	32HT84A
90	2.8125	2.875	32HT90S	32HT90A
96	3.0000	3.063	32HT96S	32HT96A
99	3.0938	3.156	32HT99S	32HT99A
112	3.5000	3.563	32HT112S	32HT112A
125	3.9063	3.969	32HT125S	32HT125A
128	4.0000	4.063	32HT128S	32HT128A
130	4.0625	4.125	32HT130S	32HT130A
132	4.1250	4.188	32HT132S	32HT132A

Other Bore Sizes Available. Consult Factory.

For Gear Hubs See Pages 12-67 & 12-68

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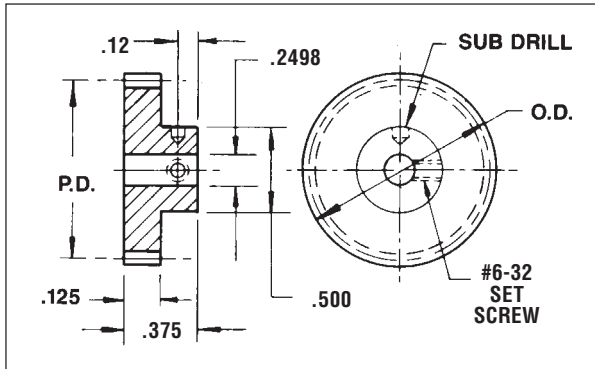
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[www.electromate.com](http://www.electromate.com)

[sales@electromate.com](mailto:sales@electromate.com)

# SPUR GEAR-32 PITCH — 1/8" Face Width ■ 20° Pressure Angle

Pin Hub - 1/4" Bore



Material: 303 Stainless Steel  
2024-T4 Aluminum  
(Anodized Before Cutting)

Tolerances	Q10	Q12	Q14
<b>Bore</b>	+ .0005 - .0000	+ .0003 - .0000	+ .0002 - .0000
<b>Pitch Diameter</b>	+ .000 - .001	+ .0000 - .0007	+ .0000 - .0005
<b>Outside Diameter</b>	+ .000 - .002	+ .0000 - .0015	+ .000 - .001
<b>Total Composite Tolerance</b>	FOR AGMA QUALITY STANDARDS SEE PAGE 12-2		
<b>Tooth to Tooth Tolerance</b>	FOR AGMA QUALITY STANDARDS SEE PAGE 12-2		

To order AGMA 12 Gears, add - Q12 to Part No.  
To order AGMA 14 Gears, add - Q14 to Part No.

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

Gear Data			Stainless Steel	Aluminum
No. Teeth	P.D.	O.D.	Part No.	Part No.
14*	0.4375	0.500	32T14S	32T14A
15*	0.4688	0.531	32T15S	32T15A
16*	0.5000	0.563	32T16S	32T16A
17*	0.5313	0.594	32T17S	32T17A
18*	0.5625	0.625	32T18S	32T18A
19*	0.5938	0.656	32T19S	32T19A
20	0.6250	0.688	32T20S	32T20A
21	0.6563	0.719	32T21S	32T21A
22	0.6875	0.750	32T22S	32T22A
23	0.7188	0.781	32T23S	32T23A
24	0.7500	0.813	32T24S	32T24A
25	0.7813	0.844	32T25S	32T25A
28	0.8750	0.938	32T28S	32T28A
30	0.9375	1.000	32T30S	32T30A
32	1.0000	1.063	32T32S	32T32A
33	1.0313	1.094	32T33S	32T33A
36	1.1250	1.188	32T36S	32T36A
39	1.2188	1.281	32T39S	32T39A
40	1.2500	1.313	32T40S	32T40A
42	1.3125	1.375	32T42S	32T42A
45	1.4063	1.469	32T45S	32T45A
48	1.5000	1.563	32T48S	32T48A
51	1.5938	1.656	32T51S	32T51A
54	1.6875	1.750	32T54S	32T54A
56	1.7500	1.813	32T56S	32T56A
60	1.8750	1.938	32T60S	32T60A
63	1.9688	2.031	32T63S	32T63A
64	2.0000	2.063	32T64S	32T64A
66	2.0625	2.125	32T66S	32T66A
69	2.1563	2.219	32T69S	32T69A
72	2.2500	2.313	32T72S	32T72A
78	2.4375	2.500	32T78S	32T78A
80	2.5000	2.563	32T80S	32T80A
84	2.6250	2.688	32T84S	32T84A
90	2.8125	2.875	32T90S	32T90A
96	3.0000	3.063	32T96S	32T96A
99	3.0938	3.156	32T99S	32T99A
112	3.5000	3.563	32T112S	32T112A
125	3.9063	3.969	32T125S	32T125A
128	4.0000	4.063	32T128S	32T128A
130	4.0625	4.125	32T130S	32T130A
132	4.1250	4.188	32T132S	32T132A

Other Bore Sizes Available. Consult Factory.

\*Hob cuts into hub. Hub O.D. never exceeds gear O.D.

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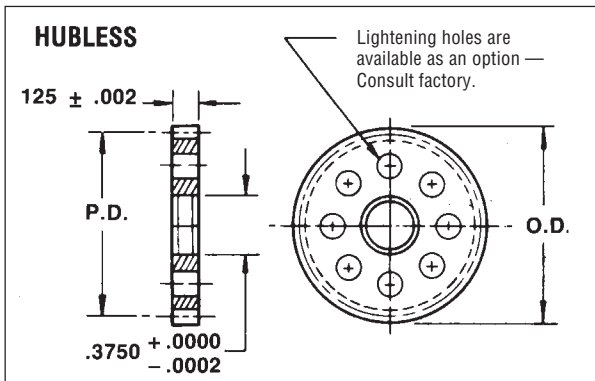
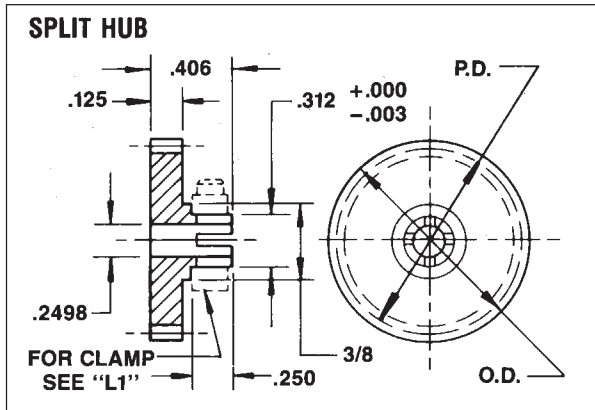
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# SPUR GEAR-32 PITCH — 1/8" Face Width ■ 20° Pressure Angle

Split Hub - 1/4" Bores — Hubless 3/8" Bore



Material: 303 Stainless Steel  
2024-T4 Aluminum  
(Anodized Before Cutting)

Tolerances	Q10	Q12	Q14
<b>Bore</b>	+ .0005 - .0000	+ .0003 - .0000	+ .0002 - .0000
<b>Pitch Diameter</b>	+ .000 - .001	+ .0000 - .0007	+ .0000 - .0005
<b>Outside Diameter</b>	+ .000 - .002	+ .0000 - .0015	+ .000 - .001
<b>Total Composite Tolerance</b>	FOR AGMA QUALITY STANDARDS		
<b>Tooth to Tooth Tolerance</b>	SEE PAGE 12-2		

To order AGMA 12 Gears, add — Q12 to Part No.  
To order AGMA 14 Gears, add — Q14 to Part No.

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

Gear Data			Stainless Steel Part No.		Aluminum Part No.	
No. Teeth	P.D.	O.D.	Split Hub	Hubless	Split Hub	Hubless
15	.4688	.531	H25-15	—	H26-15	—
16	.5000	.563	H25-16	—	H26-16	—
17	.5313	.594	H25-17	—	H26-17	—
18	.5625	.625	H25-18	—	H26-18	—
19	.5938	.656	H25-19	J23-19	H26-19	J24-19
20	.6250	.688	H25-20	J23-20	H26-20	J24-20
22	.6875	.750	H25-22	J23-22	H26-22	J24-22
24	.7500	.813	H25-24	J23-24	H26-24	J24-24
26	.8125	.875	H25-26	J23-26	H26-26	J24-26
28	.8750	.938	H25-28	J23-28	H26-28	J24-28
30	.9375	1.000	H25-30	J23-30	H26-30	J24-30
32	1.0000	1.063	H25-32	J23-32	H26-32	J24-32
36	1.1250	1.188	H25-36	J23-36	H26-36	J24-36
40	1.2500	1.313	H25-40	J23-40	H26-40	J24-40
48	1.5000	1.563	H25-48	J23-48	H26-48	J24-48
56	1.7500	1.813	H25-56	J23-56	H26-56	J24-56
64	2.0000	2.063	H25-64	J23-64	H26-64	J24-64
72	2.2500	2.313	H25-72	J23-72	H26-72	J24-72
80	2.5000	2.563	H25-80	J23-80	H26-80	J24-80
88	2.7500	2.813	H25-88	J23-88	H26-88	J24-88
96	3.0000	3.063	H25-96	J23-96	H26-96	J24-96
112	3.5000	3.563	H25-112	J23-112	H26-112	J24-112
127	3.9688	4.031	H25-127	J23-127	H26-127	J24-127
128	4.0000	4.063	H25-128	J23-128	H26-128	J24-128
132	4.1250	4.188	H25-132	J23-132	H26-132	J24-132

Other Size Bores Available. Consult Factory.

For Gear Hubs See Pages 12-67 & 12-68

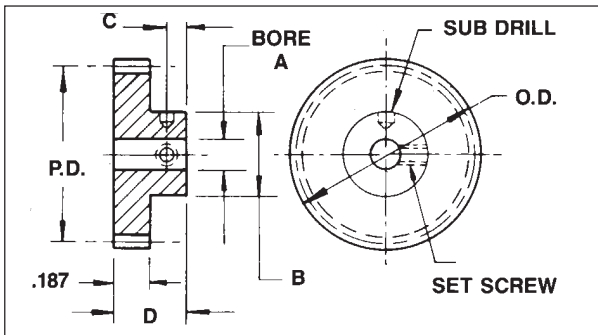
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# SPUR GEAR-32 PITCH — 3/16" Face Width ■ 20° Pressure Angle

Pin Hub — 3/16", 1/4" Bores



Material: 303 Stainless Steel  
2024-T4 Aluminum  
(Anodized Before Cutting)

Dimen.	Bore	
	3/16	1/4
A	.1873	.2498
B	.375	.500
C	.11	.12
D	.406	.437
Set Screw	#4-40	#6-32

Tolerances	Q10	Q12	Q14
<b>Bore</b>	+ .0005 - .0000	+ .0003 - .0000	+ .0002 - .0000
<b>Pitch Diameter</b>	+ .000 - .001	+ .0000 - .0007	+ .0000 - .0005
<b>Outside Diameter</b>	+ .000 - .002	+ .0000 - .0015	+ .000 - .001
<b>Total Composite Tolerance</b>	FOR AGMA QUALITY STANDARDS SEE PAGE 12-2		
<b>Tooth to Tooth Tolerance</b>	FOR AGMA QUALITY STANDARDS SEE PAGE 12-2		

To order AGMA 12 Gears, add — Q12 to Part No.  
To order AGMA 14 Gears, add — Q14 to Part No.

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

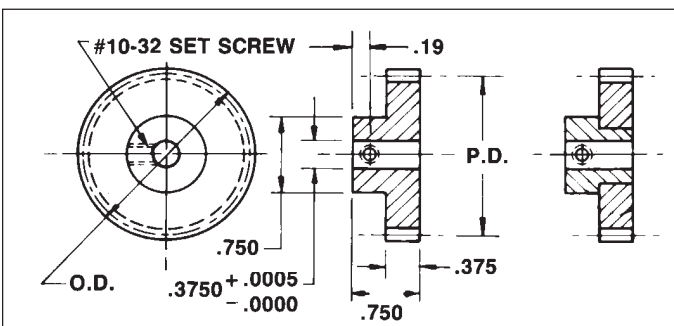
Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

Gear Data			Stainless Steel Part No. Bore Size		Aluminum Part No. Bore Size	
No. Teeth	P.D.	O.D.	.1873	.2498	.1873	.2498
15	.4688	.531	G59-15	—	G60-15	—
16	.5000	.563	G59-16	—	G60-16	—
17	.5313	.594	G59-17	—	G60-17	—
18	.5625	.625	G59-18	—	G60-18	—
20	.6250	.688	G59-20	—	G60-20	—
22	.6875	.750	G59-22	G43-22	G60-22	G44-22
24	.7500	.813	G59-24	G43-24	G60-24	G44-24
26	.8125	.875	G59-26	G43-26	G60-26	G44-26
28	.8750	.938	G59-28	G43-28	G60-28	G44-28
30	.9375	1.000	G59-30	G43-30	G60-30	G44-30
32	1.0000	1.063	G59-32	G43-32	G60-32	G44-32
34	1.0625	1.125	G59-34	G43-34	G60-34	G44-34
36	1.1250	1.188	G59-36	G43-36	G60-36	G44-36
38	1.1875	1.250	G59-38	G43-38	G60-38	G44-38
40	1.2500	1.313	G59-40	G43-40	G60-40	G44-40
44	1.3750	1.438	G59-44	G43-44	G60-44	G44-44
48	1.5000	1.563	G59-48	G43-48	G60-48	G44-48
52	1.6250	1.688	G59-52	G43-52	G60-52	G44-52
56	1.7500	1.813	G59-56	G43-56	G60-56	G44-56
60	1.8750	1.938	G59-60	G43-60	G60-60	G44-60
64	2.0000	2.063	G59-64	G43-64	G60-64	G44-64
68	2.1250	2.188	G59-68	G43-68	G60-68	G44-68
72	2.2500	2.313	G59-72	G43-72	G60-72	G44-72
80	2.5000	2.563	G59-80	G43-80	G60-80	G44-80
84	2.6250	2.688	G59-84	G43-84	G60-84	G44-84
88	2.7500	2.813	G59-88	G43-88	G60-88	G44-88
92	2.8750	2.938	G59-92	G43-92	G60-92	G44-92
96	3.0000	3.063	G59-96	G43-96	G60-96	G44-96
100	3.1250	3.188	G59-100	G43-100	G60-100	G44-100
104	3.2500	3.313	G59-104	G43-104	G60-104	G44-104
108	3.3750	3.438	G59-108	G43-108	G60-108	G44-108
112	3.5000	3.563	G59-112	G43-112	G60-112	G44-112
116	3.6250	3.688	G59-116	G43-116	G60-116	G44-116
120	3.7500	3.813	G59-120	G43-120	G60-120	G44-120
128	4.0000	4.063	G59-128	G43-128	G60-128	G44-128

Other Size Bores Available, Consult Factory.

# SPUR GEAR-32 PITCH — 3/8" Face Width ■ 20° Pressure Angle

Pin Hub — 3/8" Bore



## TOLERANCES

AGMA Quality Number 10-C	Tooth-to-Tooth Composite	Total Composite
Up to 20 Teeth Inclusive	.0007	.0010
Over 20 Teeth—up to 1.999" P.D.	.0005	.0010
Over 20 Teeth—2" to 2.999" P.D.	.0005	.0012
Over 20 Teeth—4" P.D. and over	.0005	.0014

"C"—BACKLASH DESIGNATION.

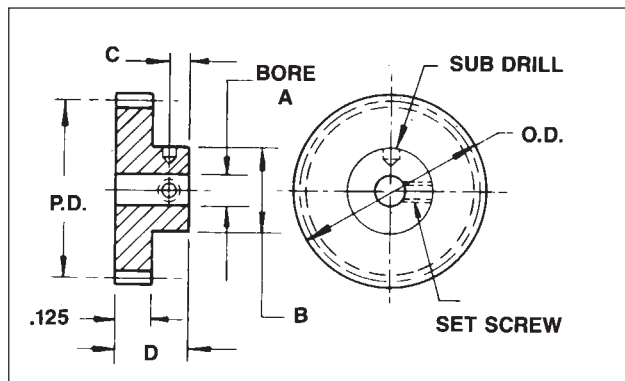
Provides .0005 to .001 tooth thinning at pitch line. Allows operation on theoretical centers.

Gear Data			#303 STAINLESS STEEL	BRONZE Alloy 464
No. Teeth	P.D.	O.D.	Part No.	Part No.
28	.8750	.938	G81-28	G82-28
30	.9375	1.000	G81-30	G82-30
32	1.0000	1.063	G81-32	G82-32
36	1.1250	1.188	G81-36	G82-36
40	1.2500	1.313	G81-40	G82-40
48	1.5000	1.563	G81-48	G82-48
56	1.7500	1.813	G81-56	G82-56
60	1.8750	1.938	G81-60	G82-60
64	2.0000	2.063	G81-64	G82-64
72	2.2500	2.313	G81-72	G82-72
80	2.5000	2.563	G81-80	G82-80
96	3.0000	3.063	G81-96	G82-96
112	3.5000	3.563	G81-112	G82-112
128	4.0000	4.063	G81-128	G82-128
144	4.5000	4.563	G81-144	G82-144
160	5.0000	5.063	G81-160	G82-160



# SPUR GEAR-48 PITCH — 1/8" Face Width ■ 20° Pressure Angle

Pin Hub — 1/8", 3/16", 1/4" Bores



Material: 303 Stainless Steel  
2024-T4 Aluminum  
(Anodized Before Cutting)

Dimen.	Bore		
	1/8	3/16	1/4
A	.1248	.1873	.2498
B	.312	.375	.500
C	.09	.11	.12
D	.312	.343	.375
Set Screw	#2-56	#4-40	#6-32

Tolerances	Q10	Q12	Q14
Bore	+ .0005	+ .0003	+ .0002
	- .0000	- .0000	- .0000
Pitch Diameter	+ .000	+ .0000	+ .0000
	- .001	- .0007	- .0005
Outside Diameter	+ .000	+ .0000	+ .000
	- .002	- .0015	- .001
Total Composite Tolerance	FOR AGMA QUALITY STANDARDS		
Tooth to Tooth Tolerance	SEE PAGE 12-2		

To order AGMA 12 Gears, add - Q12 to Part No.  
To order AGMA 14 Gears, add - Q14 to Part No.

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

Gear Data			Stainless Steel Part No. Bore Size			Aluminum Part No. Bore Size		
No. Teeth	P.D.	O.D.	.1248	.1873	.2498	.1248	.1873	.2498
18	.3750	.417	G61-18	G1-18*	—	G62-18	G2-18*	—
19	.3958	.438	G61-19	G1-19*	—	G62-19	G2-19*	—
20	.4166	.458	G61-20	G1-20*	G3-20*	G62-20	G2-20*	G4-20*
21	.4375	.479	G61-21	G1-21	G3-21*	G62-21	G2-21	G4-21*
22	.4583	.500	G61-22	G1-22	G3-22*	G62-22	G2-22	G4-22*
23	.4791	.521	G61-23	G1-23	G3-23*	G62-23	G2-23	G4-23*
24	.5000	.542	G61-24	G1-24	G3-24*	G62-24	G2-24	G4-24*
25	.5208	.563	G61-25	G1-25	G3-25*	G62-25	G2-25	G4-25*
26	.5416	.583	G61-26	G1-26	G3-26*	G62-26	G2-26	G4-26*
27	.5625	.604	G61-27	G1-27	G3-27	G62-27	G2-27	G4-27
28	.5833	.625	G61-28	G1-28	G3-28	G62-28	G2-28	G4-28
29	.6041	.646	G61-29	G1-29	G3-29	G62-29	G2-29	G4-29
30	.6250	.667	G61-30	G1-30	G3-30	G62-30	G2-30	G4-30
32	.6666	.708	G61-32	G1-32	G3-32	G62-32	G2-32	G4-32
34	.7083	.750	G61-34	G1-34	G3-34	G62-34	G2-34	G4-34
36	.7500	.792	G61-36	G1-36	G3-36	G62-36	G2-36	G4-36
38	.7916	.833	G61-38	G1-38	G3-38	G62-38	G2-38	G4-38
40	.8333	.875	G61-40	G1-40	G3-40	G62-40	G2-40	G4-40
42	.8750	.917	G61-42	G1-42	G3-42	G62-42	G2-42	G4-42
44	.9166	.958	G61-44	G1-44	G3-44	G62-44	G2-44	G4-44
46	.9583	1.000	G61-46	G1-46	G3-46	G62-46	G2-46	G4-46
48	1.0000	1.042	G61-48	G1-48	G3-48	G62-48	G2-48	G4-48
50	1.0416	1.083	G61-50	G1-50	G3-50	G62-50	G2-50	G4-50
55	1.1458	1.188	G61-55	G1-55	G3-55	G62-55	G2-55	G4-55
56	1.1666	1.208	G61-56	G1-56	G3-56	G62-56	G2-56	G4-56
60	1.2500	1.292	G61-60	G1-60	G3-60	G62-60	G2-60	G4-60
64	1.3333	1.375	G61-64	G1-64	G3-64	G62-64	G2-64	G4-64
65	1.3541	1.396	G61-65	G1-65	G3-65	G62-65	G2-65	G4-65
70	1.4583	1.500	G61-70	G1-70	G3-70	G62-70	G2-70	G4-70
72	1.5000	1.542	G61-72	G1-72	G3-72	G62-72	G2-72	G4-72
75	1.5625	1.604	G61-75	G1-75	G3-75	G62-75	G2-75	G4-75
80	1.6666	1.708	G61-80	G1-80	G3-80	G62-80	G2-80	G4-80
84	1.7500	1.792	G61-84	G1-84	G3-84	G62-84	G2-84	G4-84
85	1.7708	1.813	G61-85	G1-85	G3-85	G62-85	G2-85	G4-85
90	1.8750	1.917	G61-90	G1-90	G3-90	G62-90	G2-90	G4-90
92	1.9166	1.958	G61-92	G1-92	G3-92	G62-92	G2-92	G4-92
95	1.9791	2.021	G61-95	G1-95	G3-95	G62-95	G2-95	G4-95
96	2.0000	2.042	G61-96	G1-96	G3-96	G62-96	G2-96	G4-96
100	2.0833	2.125	G61-100	G1-100	G3-100	G62-100	G2-100	G4-100
102	2.1250	2.167	G61-102	G1-102	G3-102	G62-102	G2-102	G4-102
105	2.1875	2.229	G61-105	G1-105	G3-105	G62-105	G2-105	G4-105
108	2.2500	2.292	—	G1-108	G3-108	—	G2-108	G4-108
110	2.2917	2.333	—	G1-110	G3-110	—	G2-110	G4-110
115	2.3958	2.438	—	G1-115	G3-115	—	G2-115	G4-115
120	2.5000	2.542	—	G1-120	G3-120	—	G2-120	G4-120
126	2.6250	2.667	—	G1-126	G3-126	—	G2-126	G4-126
127	2.6458	2.688	—	G1-127	G3-127	—	G2-127	G4-127
132	2.7500	2.792	—	G1-132	G3-132	—	G2-132	G4-132
138	2.8750	2.917	—	G1-138	G3-138	—	G2-138	G4-138
144	3.0000	3.042	—	G1-144	G3-144	—	G2-144	G4-144
150	3.1250	3.167	—	G1-150	G3-150	—	G2-150	G4-150
156	3.2500	3.292	—	—	G3-156	—	—	G4-156
162	3.3750	3.417	—	—	G3-162	—	—	G4-162
168	3.5000	3.542	—	—	G3-168	—	—	G4-168
174	3.6250	3.667	—	—	G3-174	—	—	G4-174
180	3.7500	3.792	—	—	G3-180	—	—	G4-180
186	3.8750	3.917	—	—	G3-186	—	—	G4-186
192	4.0000	4.042	—	—	G3-192	—	—	G4-192
198	4.1250	4.167	—	—	G3-198	—	—	G4-198

Other Size Bores Available, Consult Factory.

\*Hub cuts into hub

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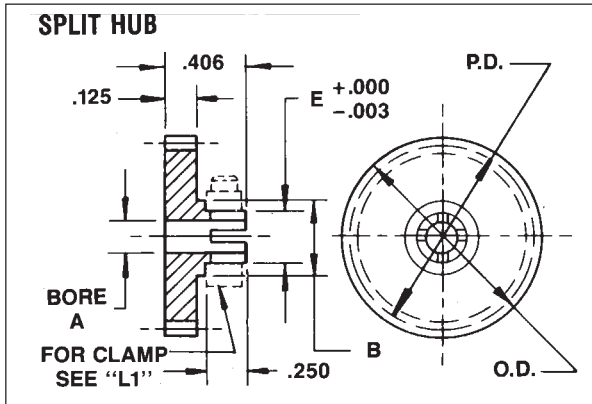
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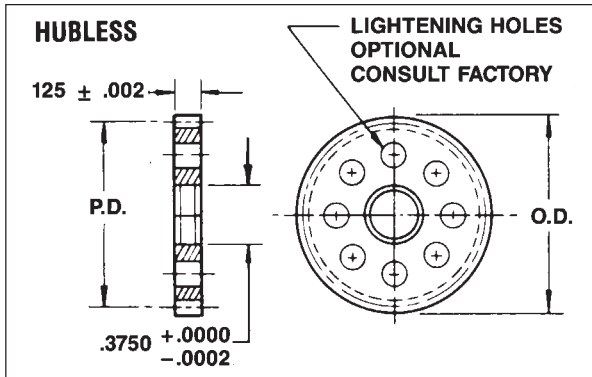
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# SPUR GEAR-48 PITCH — 1/8" Face Width ■ 20° Pressure Angle

Split Hub — 1/8", 3/16", 1/4" Bores ■ Hubless 3/8" Bore



Dimen.	Bore		
	1/8	3/16	1/4
A	.1248	.1873	.2498
B	1/4	5/16	3/8
E	.188	.250	.312



Material: 303 Stainless Steel  
2024-T4 Aluminum  
(Anodized Before Cutting)

Tolerances	Q10	Q12	Q14
<b>Bore</b>	+ .0005 - .0000	+ .0003 - .0000	+ .0002 - .0000
<b>Pitch Diameter</b>	+ .000 - .001	+ .0000 - .0007	+ .0000 - .0005
<b>Outside Diameter</b>	+ .000 - .002	+ .0000 - .0015	+ .000 - .001
<b>Total Composite Tolerance</b>	FOR AGMA QUALITY STANDARDS		
<b>Tooth to Tooth Tolerance</b>	SEE PAGE 12-2		

To order AGMA 12 Gears, add — Q12 to Part No.  
To order AGMA 14 Gears, add — Q14 to Part No.

Gear Data			Stainless Steel Part No. Bore Size				Aluminum Part No. Bore Size			
No. Teeth	P.D.	O.D.	Split Hub		Hubless	Split Hub			Hubless	
			.1248	.1873	.2498	.3750	.1248	.1873	.2498	.3750
16	.3333	.375	H55-16	—	—	—	H56-16	—	—	—
17	.3541	.396	H55-17	—	—	—	H56-17	—	—	—
18	.3750	.417	H55-18	H57-18	—	—	H56-18	H58-18	—	—
19	.3958	.438	H55-19	H57-19	—	—	H56-19	H58-19	—	—
20	.4166	.458	H55-20	H57-20	—	—	H56-20	H58-20	—	—
21	.4375	.479	H55-21	H57-21	H1-21	—	H56-21	H58-21	H2-21	—
22	.4583	.500	H55-22	H57-22	H1-22	—	H56-22	H58-22	H2-22	—
23	.4791	.521	H55-23	H57-23	H1-23	—	H56-23	H58-23	H2-23	—
24	.5000	.542	H55-24	H57-24	H1-24	—	H56-24	H58-24	H2-24	—
25	.5208	.563	H55-25	H57-25	H1-25	—	H56-25	H58-25	H2-25	—
26	.5416	.583	H55-26	H57-26	H1-26	—	H56-26	H58-26	H2-26	—
27	.5625	.604	H55-27	H57-27	H1-27	—	H56-27	H58-27	H2-27	—
28	.5833	.625	H55-28	H57-28	H1-28	—	H56-28	H58-28	H2-28	—
29	.6041	.646	H55-29	H57-29	H1-29	J1-29	H56-29	H58-29	H2-29	J2-29
30	.6250	.667	H55-30	H57-30	H1-30	J1-30	H56-30	H58-30	H2-30	J2-30
32	.6666	.708	H55-32	H57-32	H1-32	J1-32	H56-32	H58-32	H2-32	J2-32
34	.7083	.750	H55-34	H57-34	H1-34	J1-34	H56-34	H58-34	H2-34	J2-34
36	.7500	.792	H55-36	H57-36	H1-36	J1-36	H56-36	H58-36	H2-36	J2-36
38	.7916	.833	H55-38	H57-38	H1-38	J1-38	H56-38	H58-38	H2-38	J2-38
40	.8333	.875	H55-40	H57-40	H1-40	J1-40	H56-40	H58-40	H2-40	J2-40
42	.8750	.917	H55-42	H57-42	H1-42	J1-42	H56-42	H58-42	H2-42	J2-42
44	.9166	.958	H55-44	H57-44	H1-44	J1-44	H56-44	H58-44	H2-44	J2-44
46	.9583	1.000	H55-46	H57-46	H1-46	J1-46	H56-46	H58-46	H2-46	J2-46
48	1.0000	1.042	H55-48	H57-48	H1-48	J1-48	H56-48	H58-48	H2-48	J2-48
50	1.0416	1.083	H55-50	H57-50	H1-50	J1-50	H56-50	H58-50	H2-50	J2-50
55	1.1458	1.188	H55-55	H57-55	H1-55	J1-55	H56-55	H58-55	H2-55	J2-55
56	1.1666	1.208	H55-56	H57-56	H1-56	J1-56	H56-56	H58-56	H2-56	J2-56
60	1.2500	1.292	H55-60	H57-60	H1-60	J1-60	H56-60	H58-60	H2-60	J2-60
66	1.3750	1.417	H55-66	H57-66	H1-66	J1-66	H56-66	H58-66	H2-66	J2-66
72	1.5000	1.542	H55-72	H57-72	H1-72	J1-72	H56-72	H58-72	H2-72	J2-72
78	1.6250	1.667	H55-78	H57-78	H1-78	J1-78	H56-78	H58-78	H2-78	J2-78
84	1.7500	1.792	H55-84	H57-84	H1-84	J1-84	H56-84	H58-84	H2-84	J2-84
90	1.8750	1.917	H55-90	H57-90	H1-90	J1-90	H56-90	H58-90	H2-90	J2-90
96	2.0000	2.042	H55-96	H57-96	H1-96	J1-96	H56-96	H58-96	H2-96	J2-96
102	2.1250	2.167	H55-102	H57-102	H1-102	J1-102	H56-102	H58-102	H2-102	J2-102
108	2.2500	2.292	H55-108	H57-108	H1-108	J1-108	H56-108	H58-108	H2-108	J2-108
114	2.3750	2.417	H55-114	H57-114	H1-114	J1-114	H56-114	H58-114	H2-114	J2-114
120	2.5000	2.542	H55-120	H57-120	H1-120	J1-120	H56-120	H58-120	H2-120	J2-120
127	2.6458	2.688	H55-127	H57-127	H1-127	J1-127	H56-127	H58-127	H2-127	J2-127
132	2.7500	2.792	H55-132	H57-132	H1-132	J1-132	H56-132	H58-132	H2-132	J2-132
144	3.0000	3.042	H55-144	H57-144	H1-144	J1-144	H56-144	H58-144	H2-144	J2-144
156	3.2500	3.292	H55-156	H57-156	H1-156	J1-156	H56-156	H58-156	H2-156	J2-156
168	3.5000	3.542	H55-168	H57-168	H1-168	J1-168	H56-168	H58-168	H2-168	J2-168
180	3.7500	3.792	H55-180	H57-180	H1-180	J1-180	H56-180	H58-180	H2-180	J2-180
192	4.0000	4.042	H55-192	H57-192	H1-192	J1-192	H56-192	H58-192	H2-192	J2-192

Other Size Bores Available, Consult Factory.

FOR SPECIAL SPUR GEARS ORDER AS FOLLOWS:

For Unlisted Number of Teeth, Specify the Number of Teeth desired as the last figure in the part number.  
EXAMPLE: H57-40 and H57-48 are in the above table. For a 59 Tooth Gear, Specify Part Number H57-59.

For Gear Hubs See Pages 12-65 & 12-66

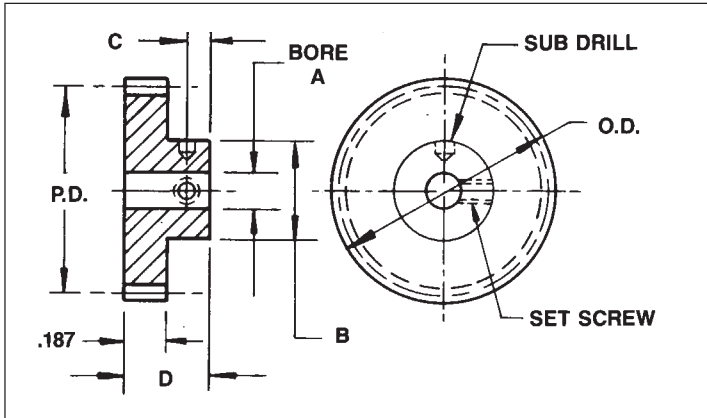
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# SPUR GEAR-48 PITCH — 3/16" Face Width ■ 20° Pressure Angle

Pin Hub — 3/16", 1/4" Bores



Material: 303 Stainless Steel  
2024-T4 Aluminum  
(Anodized Before Cutting)

Dimen.	Bore	
	3/16	1/4
A	.1873	.2498
B	.375	.500
C	.11	.12
D	.406	.437
Set Screw	#4-40	#6-32

Tolerances	Q10	Q12	Q14
<b>Bore</b>	+ .0005 - .0000	+ .0003 - .0000	+ .0002 - .0000
<b>Pitch Diameter</b>	+ .000 - .001	+ .0000 - .0007	+ .0000 - .0005
<b>Outside Diameter</b>	+ .000 - .002	+ .0000 - .0015	+ .000 - .001
<b>Total Composite Tolerance</b>	FOR AGMA QUALITY STANDARDS SEE PAGE 12-2		
<b>Tooth to Tooth Tolerance</b>	FOR AGMA QUALITY STANDARDS SEE PAGE 12-2		

To order AGMA 12 Gears, add — Q12 to Part No.  
To order AGMA 14 Gears, add — Q14 to Part No.

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

Gear Data			Stainless Steel Part No. Bore Size		Aluminum Part No. Bore Size	
No. Teeth	P.D.	O.D.	.1873	.2498	.1873	.2498
21	.4375	.479	G5-21	—	G6-21	—
22	.4583	.500	G5-22	—	G6-22	—
23	.4791	.521	G5-23	—	G6-23	—
24	.5000	.542	G5-24	—	G6-24	—
25	.5208	.563	G5-25	—	G6-25	—
26	.5416	.583	G5-26	—	G6-26	—
27	.5625	.604	G5-27	G7-27	G6-27	G8-27
28	.5833	.625	G5-28	G7-28	G6-28	G8-28
29	.6041	.646	G5-29	G7-29	G6-29	G8-29
30	.6250	.667	G5-30	G7-30	G6-30	G8-30
32	.6666	.708	G5-32	G7-32	G6-32	G8-32
34	.7083	.750	G5-34	G7-34	G6-34	G8-34
36	.7500	.792	G5-36	G7-36	G6-36	G8-36
38	.7916	.833	G5-38	G7-38	G6-38	G8-38
40	.8333	.875	G5-40	G7-40	G6-40	G8-40
42	.8750	.917	G5-42	G7-42	G6-42	G8-42
44	.9166	.958	G5-44	G7-44	G6-44	G8-44
46	.9583	1.000	G5-46	G7-46	G6-46	G8-46
48	1.0000	1.042	G5-48	G7-48	G6-48	G8-48
50	1.0416	1.083	G5-50	G7-50	G6-50	G8-50
55	1.1458	1.188	G5-55	G7-55	G6-55	G8-55
56	1.1666	1.208	G5-56	G7-56	G6-56	G8-56
60	1.2500	1.292	G5-60	G7-60	G6-60	G8-60
64	1.3333	1.375	G5-64	G7-64	G6-64	G8-64
65	1.3541	1.396	G5-65	G7-65	G6-65	G8-65
70	1.4583	1.500	G5-70	G7-70	G6-70	G8-70
72	1.5000	1.542	G5-72	G7-72	G6-72	G8-72
75	1.5625	1.604	G5-75	G7-75	G6-75	G8-75
80	1.6666	1.708	G5-80	G7-80	G6-80	G8-80
84	1.7500	1.792	G5-84	G7-84	G6-84	G8-84
85	1.7708	1.813	G5-85	G7-85	G6-85	G8-85
90	1.8750	1.917	G5-90	G7-90	G6-90	G8-90
92	1.9166	1.958	G5-92	G7-92	G6-92	G8-92
95	1.9791	2.021	G5-95	G7-95	G6-95	G8-95
96	2.0000	2.042	G5-96	G7-96	G6-96	G8-96
100	2.0833	2.125	G5-100	G7-100	G6-100	G8-100
102	2.1250	2.167	G5-102	G7-102	G6-102	G8-102
105	2.1875	2.229	G5-105	G7-105	G6-105	G8-105
108	2.2500	2.292	G5-108	G7-108	G6-108	G8-108
110	2.2917	2.333	G5-110	G7-110	G6-110	G8-110
115	2.3958	2.438	G5-115	G7-115	G6-115	G8-115
120	2.5000	2.542	G5-120	G7-120	G6-120	G8-120
126	2.6250	2.667	G5-126	G7-126	G6-126	G8-126
127	2.6458	2.688	G5-127	G7-127	G6-127	G8-127
132	2.7500	2.792	G5-132	G7-132	G6-132	G8-132
138	2.8750	2.917	G5-138	G7-138	G6-138	G8-138
144	3.0000	3.042	G5-144	G7-144	G6-144	G8-144
150	3.1250	3.167	G5-150	G7-150	G6-150	G8-150
156	3.2500	3.292	G5-156	G7-156	G6-156	G8-156
162	3.3750	3.417	G5-162	G7-162	G6-162	G8-162
168	3.5000	3.542	G5-168	G7-168	G6-168	G8-168
174	3.6250	3.667	G5-174	G7-174	G6-174	G8-174
180	3.7500	3.792	G5-180	G7-180	G6-180	G8-180
186	3.8750	3.917	G5-186	G7-186	G6-186	G8-186
192	4.0000	4.042	G5-192	G7-192	G6-192	G8-192
198	4.1250	4.167	—	G7-198	—	G8-198

Other Size Bores Available. Consult Factory.

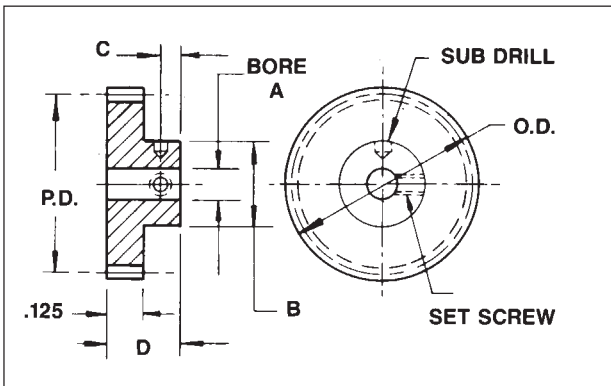
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# SPUR GEAR-64 PITCH — 1/8" Face Width ■ 20° Pressure Angle

Pin Hub — 1/8", 3/16", 1/4" Bores



Material: 303 Stainless Steel  
2024-T4 Aluminum  
(Anodized Before Cutting)

Dimen.	Bore		
	1/8	3/16	1/4
A	.1248	.1873	.2498
B	.312	.375	.500
C	.09	.11	.12
D	.312	.343	.375
Set Screw	#2-56	#4-40	#6-32

Tolerances	Q10	Q12	Q14
<b>Bore</b>	+ .0005 - .0000	+ .0003 - .0000	+ .0002 - .0000
<b>Pitch Diameter</b>	+ .000 - .001	+ .0000 - .0007	+ .0000 - .0005
<b>Outside Diameter</b>	+ .000 - .002	+ .0000 - .0015	+ .000 - .001
<b>Total Composite Tolerance</b>	FOR AGMA QUALITY STANDARDS SEE PAGE 12-2		
<b>Tooth to Tooth Tolerance</b>	FOR AGMA QUALITY STANDARDS SEE PAGE 12-2		

To order AGMA 12 Gears, add - Q12 to Part No.  
To order AGMA 14 Gears, add - Q14 to Part No.

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

Gear Data			Stainless Steel Part No. Bore Size			Aluminum Part No. Bore Size		
No. Teeth	P.D.	O.D.	.1248	.1873	.2498	.1248	.1873	.2498
23	.3593	.391	G9-23	—	—	G10-23	—	—
24	.3750	.406	G9-24	—	—	G10-24	—	—
25	.3906	.422	G9-25	—	—	G10-25	—	—
26	.4062	.438	G9-26	—	—	G10-26	—	—
27	.4218	.453	G9-27	G11-27	—	G10-27	G12-27	—
28	.4375	.469	G9-28	G11-28	—	G10-28	G12-28	—
29	.4531	.484	G9-29	G11-29	—	G10-29	G12-29	—
30	.4687	.500	G9-30	G11-30	—	G10-30	G12-30	—
32	.5000	.531	G9-32	G11-32	—	G10-32	G12-32	—
34	.5312	.563	G9-34	G11-34	—	G10-34	G12-34	—
36	.5625	.594	G9-36	G11-36	G13-36	G10-36	G12-36	G14-36
38	.5937	.625	G9-38	G11-38	G13-38	G10-38	G12-38	G14-38
40	.6250	.656	G9-40	G11-40	G13-40	G10-40	G12-40	G14-40
42	.6562	.688	G9-42	G11-42	G13-42	G10-42	G12-42	G14-42
44	.6875	.719	G9-44	G11-44	G13-44	G10-44	G12-44	G14-44
46	.7187	.750	G9-46	G11-46	G13-46	G10-46	G12-46	G14-46
48	.7500	.781	G9-48	G11-48	G13-48	G10-48	G12-48	G14-48
50	.7812	.813	G9-50	G11-50	G13-50	G10-50	G12-50	G14-50
55	.8593	.891	G9-55	G11-55	G13-55	G10-55	G12-55	G14-55
56	.8750	.906	G9-56	G11-56	G13-56	G10-56	G12-56	G14-56
60	.9375	.969	G9-60	G11-60	G13-60	G10-60	G12-60	G14-60
64	1.0000	1.031	G9-64	G11-64	G13-64	G10-64	G12-64	G14-64
65	1.0156	1.047	G9-65	G11-65	G13-65	G10-65	G12-65	G14-65
70	1.0937	1.125	G9-70	G11-70	G13-70	G10-70	G12-70	G14-70
72	1.1250	1.156	G9-72	G11-72	G13-72	G10-72	G12-72	G14-72
75	1.1718	1.203	G9-75	G11-75	G13-75	G10-75	G12-75	G14-75
80	1.2500	1.281	G9-80	G11-80	G13-80	G10-80	G12-80	G14-80
84	1.3125	1.344	G9-84	G11-84	G13-84	G10-84	G12-84	G14-84
85	1.3281	1.359	G9-85	G11-85	G13-85	G10-85	G12-85	G14-85
88	1.3750	1.406	G9-88	G11-88	G13-88	G10-88	G12-88	G14-88
90	1.4062	1.438	G9-90	G11-90	G13-90	G10-90	G12-90	G14-90
92	1.4375	1.469	G9-92	G11-92	G13-92	G10-92	G12-92	G14-92
95	1.4843	1.516	G9-95	G11-95	G13-95	G10-95	G12-95	G14-95
96	1.5000	1.531	G9-96	G11-96	G13-96	G10-96	G12-96	G14-96
100	1.5625	1.594	G9-100	G11-100	G13-100	G10-100	G12-100	G14-100
104	1.6250	1.656	G9-104	G11-104	G13-104	G10-104	G12-104	G14-104
105	1.6406	1.672	G9-105	G11-105	G13-105	G10-105	G12-105	G14-105
112	1.7500	1.781	G9-112	G11-112	G13-112	G10-112	G12-112	G14-112
120	1.8750	1.906	G9-120	G11-120	G13-120	G10-120	G12-120	G14-120
127	1.9843	2.016	G9-127	G11-127	G13-127	G10-127	G12-127	G14-127
128	2.0000	2.031	G9-128	G11-128	G13-128	G10-128	G12-128	G14-128
136	2.1250	2.156	G9-136	G11-136	G13-136	G10-136	G12-136	G14-136
144	2.2500	2.281	—	G11-144	G13-144	—	G12-144	G14-144
152	2.3750	2.406	—	G11-152	G13-152	—	G12-152	G14-152
160	2.5000	2.531	—	G11-160	G13-160	—	G12-160	G14-160
168	2.6250	2.656	—	G11-168	G13-168	—	G12-168	G14-168
176	2.7500	2.781	—	G11-176	G13-176	—	G12-176	G14-176
184	2.8750	2.906	—	G11-184	G13-184	—	G12-184	G14-184
192	3.0000	3.031	—	G11-192	G13-192	—	G12-192	G14-192
200	3.1250	3.156	—	G11-200	G13-200	—	G12-200	G14-200
208	3.2500	3.281	—	—	G13-208	—	—	G14-208
216	3.3750	3.406	—	—	G13-216	—	—	G14-216
224	3.5000	3.531	—	—	G13-224	—	—	G14-224
232	3.6250	3.656	—	—	G13-232	—	—	G14-232
240	3.7500	3.781	—	—	G13-240	—	—	G14-240
248	3.8750	3.906	—	—	G13-248	—	—	G14-248
256	4.0000	4.031	—	—	G13-256	—	—	G14-256
264	4.1250	4.156	—	—	G13-264	—	—	G14-264

Other Size Bores Available. Consult Factory.

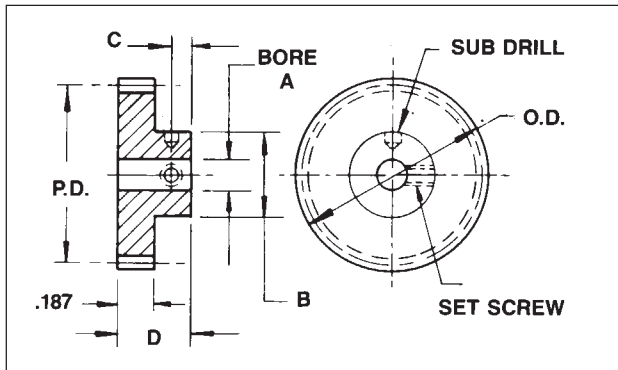
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# SPUR GEAR-64 PITCH — 3/16" Face Width ■ 20° Pressure Angle

Pin Hub — 3/16", 1/4" Bores



Material: 303 Stainless Steel  
2024-T4 Aluminum  
(Anodized Before Cutting)

Dimen.	Bore	
	3/16	1/4
A	.1873	.2498
B	.375	.500
C	.11	.12
D	.406	.437
Set Screw	#4-40	#6-32

Tolerances	Q10	Q12	Q14
<b>Bore</b>	+ .0005 - .0000	+ .0003 - .0000	+ .0002 - .0000
<b>Pitch Diameter</b>	+ .000 - .001	+ .0000 - .0007	+ .0000 - .0005
<b>Outside Diameter</b>	+ .000 - .002	+ .0000 - .0015	+ .000 - .001
<b>Total Composite Tolerance</b>	FOR AGMA QUALITY STANDARDS SEE PAGE 12-2		
<b>Tooth to Tooth Tolerance</b>	SEE PAGE 12-2		

To order AGMA 12 Gears, add - Q12 to Part No.  
To order AGMA 14 Gears, add - Q14 to Part No.

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

Gear Data			Stainless Steel Part No. Bore Size		Aluminum Part No. Bore Size	
No. Teeth	P.D.	O.D.	.1873	.2498	.1873	.2498
27	.4218	.453	G15-27	—	G16-27	—
28	.4375	.469	G15-28	—	G16-28	—
29	.4531	.484	G15-29	—	G16-29	—
30	.4687	.500	G15-30	G17-30	G16-30	—
32	.5000	.531	G15-32	G17-32	G16-32	—
34	.5312	.563	G15-34	G17-34	G16-34	G18-34
36	.5625	.594	G15-36	G17-36	G16-36	G18-36
38	.5937	.625	G15-38	G17-38	G16-38	G18-38
40	.6250	.656	G15-40	G17-40	G16-40	G18-40
42	.6562	.688	G15-42	G17-42	G16-42	G18-42
44	.6875	.719	G15-44	G17-44	G16-44	G18-44
46	.7187	.750	G15-46	G17-46	G16-46	G18-46
48	.7500	.781	G15-48	G17-48	G16-48	G18-48
50	.7812	.813	G15-50	G17-50	G16-50	G18-50
55	.8593	.891	G15-55	G17-55	G16-55	G18-55
56	.8750	.906	G15-56	G17-56	G16-56	G18-56
60	.9375	.969	G15-60	G17-60	G16-60	G18-60
64	1.0000	1.031	G15-64	G17-64	G16-64	G18-64
65	1.0156	1.047	G15-65	G17-65	G16-65	G18-65
70	1.0937	1.125	G15-70	G17-70	G16-70	G18-70
72	1.1250	1.156	G15-72	G17-72	G16-72	G18-72
75	1.1718	1.203	G15-75	G17-75	G16-75	G18-75
80	1.2500	1.281	G15-80	G17-80	G16-80	G18-80
84	1.3125	1.344	G15-84	G17-84	G16-84	G18-84
85	1.3281	1.359	G15-85	G17-85	G16-85	G18-85
88	1.3750	1.406	G15-88	G17-88	G16-88	G18-88
90	1.4062	1.438	G15-90	G17-90	G16-90	G18-90
92	1.4375	1.469	G15-92	G17-92	G16-92	G18-92
95	1.4843	1.516	G15-95	G17-95	G16-95	G18-95
96	1.5000	1.531	G15-96	G17-96	G16-96	G18-96
100	1.5625	1.594	G15-100	G17-100	G16-100	G18-100
104	1.6250	1.656	G15-104	G17-104	G16-104	G18-104
105	1.6406	1.672	G15-105	G17-105	G16-105	G18-105
112	1.7500	1.781	G15-112	G17-112	G16-112	G18-112
120	1.8750	1.906	G15-120	G17-120	G16-120	G18-120
127	1.9843	2.016	G15-127	G17-127	G16-127	G18-127
128	2.0000	2.031	G15-128	G17-128	G16-128	G18-128
136	2.1250	2.156	G15-136	G17-136	G16-136	G18-136
144	2.2500	2.281	G15-144	G17-144	G16-144	G18-144
152	2.3750	2.406	G15-152	G17-152	G16-152	G18-152
160	2.5000	2.531	G15-160	G17-160	G16-160	G18-160
168	2.6250	2.656	G15-168	G17-168	G16-168	G18-168
176	2.7500	2.781	G15-176	G17-176	G16-176	G18-176
184	2.8750	2.906	G15-184	G17-184	G16-184	G18-184
192	3.0000	3.031	G15-192	G17-192	G16-192	G18-192
200	3.1250	3.156	G15-200	G17-200	G16-200	G18-200
208	3.2500	3.281	G15-208	G17-208	G16-208	G18-208
216	3.3750	3.406	G15-216	G17-216	G16-216	G18-216
224	3.5000	3.531	G15-224	G17-224	G16-224	G18-224
232	3.6250	3.656	G15-232	G17-232	G16-232	G18-232
240	3.7500	3.781	G15-240	G17-240	G16-240	G18-240
248	3.8750	3.906	G15-248	G17-248	G16-248	G18-248
256	4.0000	4.031	G15-256	G17-256	G16-256	G18-256

Other Size Bores Available. Consult Factory.

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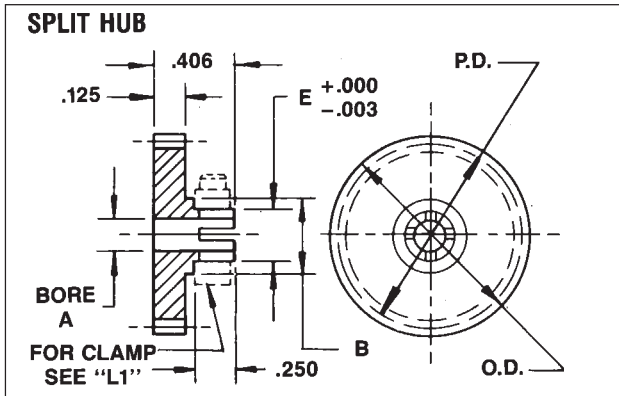


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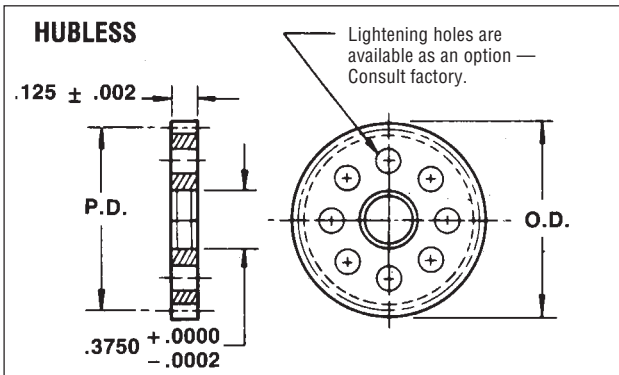


# SPUR GEAR-64 PITCH — 1/8" Face Width ■ 20° Pressure Angle

Split Hub — 1/8", 3/16", 1/4" Bores ■ Hubless 3/8" Bore



Dimen.	Bore		
	1/8	3/16	1/4
A	.1248	.1873	.2498
B	1/4	5/16	3/8
E	.188	.250	.312



Material: 303 Stainless Steel  
2024-T4 Aluminum  
(Anodized Before Cutting)

Tolerances	Q10	Q12	Q14
Bore (Split Hub)	+0.0005 -0.0000	+0.0003 -0.0000	+0.0002 -0.0000
Pitch Diameter	+0.000 -0.001	+0.0000 -0.0007	+0.0000 -0.0005
Outside Diameter	+0.000 -0.002	+0.0000 -0.0015	+0.000 -0.001
Total Composite Tolerance	FOR AGMA QUALITY STANDARDS		
Tooth to Tooth Tolerance	SEE PAGE 12-2		

Gear Data			Stainless Steel Part No. Bore Size				Aluminum Part No. Bore Size			
No. Teeth	P.D.	O.D.	Split Hub		Hubless	Split Hub		Hubless		
			.1248	.1873	.2498	.3750	.1248	.1873	.2498	.3750
19	.2969	.328	H47-19	—	—	—	H48-19	—	—	—
20	.3125	.344	H47-20	—	—	—	H48-20	—	—	—
21	.3281	.359	H47-21	—	—	—	H48-21	—	—	—
22	.3437	.375	H47-22	—	H49-22	—	H48-22	—	—	—
23	.3593	.391	H47-23	H3-23	H49-23	—	H48-23	H4-23	—	—
24	.3750	.406	H47-24	H3-24	H49-24	—	H48-24	H4-24	—	—
25	.3906	.422	H47-25	H3-25	H49-25	—	H48-25	H4-25	—	—
26	.4062	.438	H47-26	H3-26	H49-26	—	H48-26	H4-26	—	—
27	.4218	.453	H47-27	H3-27	H49-27	—	H48-27	H4-27	H50-27	—
28	.4375	.469	H47-28	H3-28	H49-28	—	H48-28	H4-28	H50-28	—
29	.4531	.484	H47-29	H3-29	H49-29	—	H48-29	H4-29	H50-29	—
30	.4687	.500	H47-30	H3-30	H49-30	—	H48-30	H4-30	H50-30	—
32	.5000	.531	H47-32	H3-32	H49-32	—	H48-32	H4-32	H50-32	—
34	.5312	.563	H47-34	H3-34	H49-34	—	H48-34	H4-34	H50-34	—
36	.5625	.594	H47-36	H3-36	H49-36	—	H48-36	H4-36	H50-36	—
38	.5937	.625	H47-38	H3-38	H49-38	J3-38	H48-38	H4-38	H50-38	J4-38
40	.6250	.656	H47-40	H3-40	H49-40	J3-40	H48-40	H4-40	H50-40	J4-40
42	.6562	.688	H47-42	H3-42	H49-42	J3-42	H48-42	H4-42	H50-42	J4-42
44	.6875	.719	H47-44	H3-44	H49-44	J3-44	H48-44	H4-44	H50-44	J4-44
46	.7187	.750	H47-46	H3-46	H49-46	J3-46	H48-46	H4-46	H50-46	J4-46
48	.7500	.781	H47-48	H3-48	H49-48	J3-48	H48-48	H4-48	H50-48	J4-48
50	.7812	.813	H47-50	H3-50	H49-50	J3-50	H48-50	H4-50	H50-50	J4-50
55	.8593	.891	H47-55	H3-55	H49-55	J3-55	H48-55	H4-55	H50-55	J4-55
56	.8750	.906	H47-56	H3-56	H49-56	J3-56	H48-56	H4-56	H50-56	J4-56
60	.9375	.969	H47-60	H3-60	H49-60	J3-60	H48-60	H4-60	H50-60	J4-60
64	1.0000	1.031	H47-64	H3-64	H49-64	J3-64	H48-64	H4-64	H50-64	J4-64
72	1.1250	1.156	H47-72	H3-72	H49-72	J3-72	H48-72	H4-72	H50-72	J4-72
80	1.2500	1.281	H47-80	H3-80	H49-80	J3-80	H48-80	H4-80	H50-80	J4-80
88	1.3750	1.406	H47-88	H3-88	H49-88	J3-88	H48-88	H4-88	H50-88	J4-88
96	1.5000	1.531	H47-96	H3-96	H49-96	J3-96	H48-96	H4-96	H50-96	J4-96
104	1.6250	1.656	H47-104	H3-104	H49-104	J3-104	H48-104	H4-104	H50-104	J4-104
112	1.7500	1.781	H47-112	H3-112	H49-112	J3-112	H48-112	H4-112	H50-112	J4-112
120	1.8750	1.906	H47-120	H3-120	H49-120	J3-120	H48-120	H4-120	H50-120	J4-120
127	1.9843	2.016	—	—	H49-127	J3-127	—	—	H50-127	J4-127
128	2.0000	2.031	—	—	H49-128	J3-128	—	—	H50-128	J4-128
136	2.1250	2.156	—	—	H49-136	J3-136	—	—	H50-136	J4-136
144	2.2500	2.281	—	—	H49-144	J3-144	—	—	H50-144	J4-144
160	2.5000	2.531	—	—	H49-160	J3-160	—	—	H50-160	J4-160
176	2.7500	2.781	—	—	H49-176	J3-176	—	—	H50-176	J4-176
192	3.0000	3.031	—	—	H49-192	J3-192	—	—	H50-192	J4-192
208	3.2500	3.281	—	—	H49-208	J3-208	—	—	H50-208	J4-208
224	3.5000	3.531	—	—	H49-224	J3-224	—	—	H50-224	J4-224
240	3.7500	3.781	—	—	H49-240	J3-240	—	—	H50-240	J4-240
240	—	—	—	—	H49-256	J3-256	—	—	H50-256	J4-256
264	—	—	—	—	H49-264	J3-264	—	—	H50-264	J4-264

Other Size Bores Available, Consult Factory.

For Gear Hubs See Pages 12-67 & 12-68

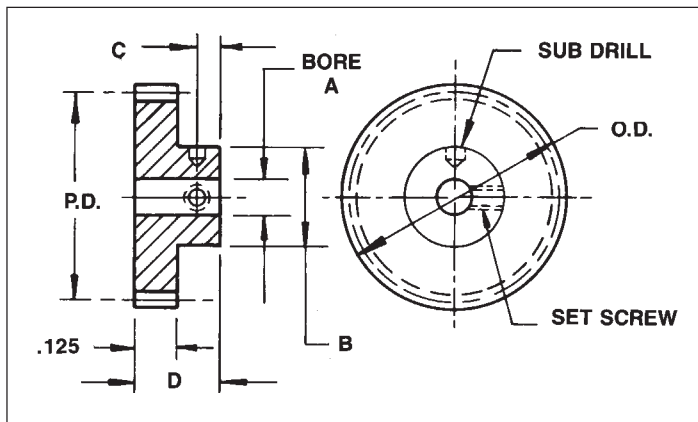
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# SPUR GEAR-72 PITCH — 1/8" Face Width ■ 20° Pressure Angle

Pin Hub — 1/8", 3/16" Bores



Material: 303 Stainless Steel  
2024-T4 Aluminum  
(Anodized Before Cutting)

Dimen.	Bore	
	1/8	3/16
A	.1248	.1873
B	.312	.375
C	.09	.11
D	.312	.343
Set Screw	#2-56	#4-40

Tolerances	Q10	Q12	Q14
Bore	+ .0005	+ .0003	+ .0002
	- .0000	- .0000	- .0000
Pitch Diameter	+ .000	+ .0000	+ .0000
	- .001	- .0007	- .0005
Outside Diameter	+ .000	+ .0000	+ .000
	- .002	- .0015	- .001
Total Composite Tolerance	FOR AGMA QUALITY STANDARDS		
Tooth to Tooth Tolerance	SEE PAGE 12-2		

To order AGMA 12 Gears, add — Q12 to Part No.  
To order AGMA 14 Gears, add — Q14 to Part No.

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

Gear Data			Stainless Steel Part No. Bore Size		Aluminum Part No. Bore Size	
No. Teeth	P.D.	O.D.	.1248	.1873	.1248	.1873
26	.3610	.389	G19-26	—	G20-26	—
27	.3750	.403	G19-27	—	G20-27	—
28	.3888	.417	G19-28	—	G20-28	—
30	.4166	.444	G19-30	G21-30	G20-30	G22-30
32	.4444	.472	G19-32	G21-32	G20-32	G22-32
34	.4722	.500	G19-34	G21-34	G20-34	G22-34
36	.5000	.528	G19-36	G21-36	G20-36	G22-36
38	.5277	.556	G19-38	G21-38	G20-38	G22-38
40	.5555	.583	G19-40	G21-40	G20-40	G22-40
42	.5833	.611	G19-42	G21-42	G20-42	G22-42
44	.6111	.639	G19-44	G21-44	G20-44	G22-44
45	.6250	.653	G19-45	G21-45	G20-45	G22-45
46	.6388	.667	G19-46	G21-46	G20-46	G22-46
48	.6666	.694	G19-48	G21-48	G20-48	G22-48
50	.6944	.722	G19-50	G21-50	G20-50	G22-50
54	.7500	.778	G19-54	G21-54	G20-54	G22-54
55	.7638	.792	G19-55	G21-55	G20-55	G22-55
56	.7777	.806	G19-56	G21-56	G20-56	G22-56
60	.8333	.861	G19-60	G21-60	G20-60	G22-60
63	.8750	.903	G19-63	G21-63	G20-63	G22-63
64	.8888	.917	G19-64	G21-64	G20-64	G22-64
70	.9722	1.000	G19-70	G21-70	G20-70	G22-70
72	1.0000	1.028	G19-72	G21-72	G20-72	G22-72
75	1.0416	1.069	G19-75	G21-75	G20-75	G22-75
80	1.1111	1.139	G19-80	G21-80	G20-80	G22-80
81	1.1250	1.153	G19-81	G21-81	G20-81	G22-81
84	1.1666	1.194	G19-84	G21-84	G20-84	G22-84
85	1.1805	1.208	G19-85	G21-85	G20-85	G22-85
90	1.2500	1.278	G19-90	G21-90	G20-90	G22-90
92	1.2777	1.306	G19-92	G21-92	G20-92	G22-92
95	1.3194	1.347	G19-95	G21-95	G20-95	G22-95
96	1.3333	1.361	G19-96	G22-96	G20-96	G22-96
99	1.3750	1.403	G19-99	G21-99	G20-99	G22-99
100	1.3888	1.417	G19-100	G21-100	G20-100	G22-100
105	1.4583	1.486	G19-105	G21-105	G20-105	G22-105
108	1.5000	1.528	G19-108	G21-108	G20-108	G22-108
110	1.5277	1.556	G19-110	G21-110	G20-110	G22-110
117	1.6249	1.653	G19-117	G21-117	G20-117	G22-117
120	1.6666	1.694	G19-120	G21-120	G20-120	G22-120
126	1.7499	1.778	G19-126	G21-126	G20-126	G22-126
127	1.7638	1.792	G19-127	G21-127	G20-127	G22-127
130	1.8055	1.833	G19-130	G21-130	G20-130	G22-130
135	1.8749	1.903	G19-135	G21-135	G20-135	G22-135
140	1.9444	1.972	G19-140	G21-140	G20-140	G22-140
144	2.0000	2.028	G19-144	G21-144	G20-144	G22-144
150	2.0833	2.111	G19-150	G21-150	G20-150	G22-150
153	2.1249	2.153	G19-153	G21-153	G20-153	G22-153
160	2.2222	2.250	—	G21-160	—	G22-160
162	2.2499	2.278	—	G21-162	—	G22-162
180	2.5000	2.528	—	G21-180	—	G22-180
198	2.7499	2.778	—	G21-198	—	G22-198
216	3.0000	3.028	—	G21-216	—	G22-216

Other Size Bores Available. Consult Factory.

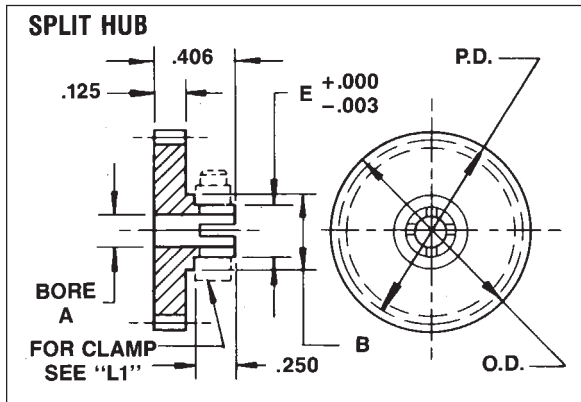
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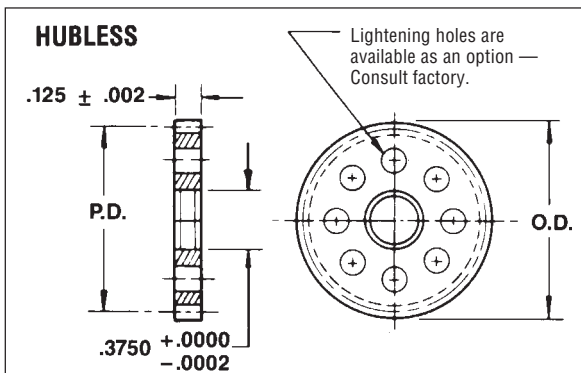
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# SPUR GEAR-72 PITCH — 1/8" Face Width ■ 20° Pressure Angle

Split Hub — 3/16", 1/4" Bores ■ Hubless 3/8" Bore



Dimen.	Bore	
	3/16	1/4
A	.1873	.2498
B	5/16	3/8
E	.250	.312



Material: 303 Stainless Steel  
2024-T4 Aluminum  
(Anodized Before Cutting)

Tolerances	Q10	Q12	Q14
<b>Bore</b>	+ .0005 - .0000	+ .0003 - .0000	+ .0002 - .0000
<b>Pitch Diameter</b>	+ .000 - .001	+ .0000 - .0007	+ .0000 - .0005
<b>Outside Diameter</b>	+ .000 - .002	+ .0000 - .0015	+ .000 - .001
<b>Total Composite Tolerance</b>	FOR AGMA QUALITY STANDARDS		
<b>Tooth to Tooth Tolerance</b>	SEE PAGE 12-2		

To order AGMA 12 Gears, add — Q12 to Part No.  
To order AGMA 14 Gears, add — Q14 to Part No.

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.  
Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

Gear Data			Stainless Steel Part No. Bore Size			Aluminum Part No. Bore Size		
No. Teeth	P.D.	O.D.	Split Hub		Hubless	Split Hub		Hubless
			.1873	.2498	.3750	.1873	.2498	.3750
29	.4027	.431	H5-29	—	—	H6-29	—	—
30	.4166	.444	H5-30	—	—	H6-30	—	—
32	.4444	.472	H5-32	—	—	H6-32	—	—
34	.4722	.500	H5-34	—	—	H6-34	—	—
36	.5000	.528	H5-36	H59-36	—	H6-36	H60-36	—
38	.5277	.556	H5-38	H59-38	—	H6-38	H60-38	—
40	.5555	.583	H5-40	H59-40	—	H6-40	H60-40	—
42	.5833	.611	H5-42	H59-42	—	H6-42	H60-42	—
45	.6250	.653	H5-45	H59-45	J5-45	H6-45	H60-45	J6-45
54	.7500	.778	H5-54	H59-54	J5-54	H6-54	H60-54	J6-54
63	.8750	.903	H5-63	H59-63	J5-63	H6-63	H60-63	J6-63
72	1.0000	1.028	H5-72	H59-72	J5-72	H6-72	H60-72	J6-72
81	1.1250	1.153	H5-81	H59-81	J5-81	H6-81	H60-81	J6-81
90	1.2500	1.278	H5-90	H59-90	J5-90	H6-90	H60-90	J6-90
99	1.3750	1.403	H5-99	H59-99	J5-99	H6-99	H60-99	J6-99
108	1.5000	1.528	H5-108	H59-108	J5-108	H6-108	H60-108	J6-108
117	1.6249	1.653	H5-117	H59-117	J5-117	H6-117	H60-117	J6-117
126	1.7499	1.778	H5-126	H59-126	J5-126	H6-126	H60-126	J6-126
127	1.7683	1.792	H5-127	H59-127	J5-127	H6-127	H60-127	J6-127
135	1.8749	1.903	H5-135	H59-135	J5-135	H6-135	H60-135	J6-135
144	2.0000	2.028	H5-144	H59-144	J5-144	H6-144	H60-144	J6-144
153	2.1249	2.153	H5-153	H59-153	J5-153	H6-153	H60-153	J6-153
162	2.2499	2.278	H5-162	H59-162	J5-162	H6-162	H60-162	J6-162
171	2.3749	2.403	H5-171	H59-171	J5-171	H6-171	H60-171	J6-171
180	2.5000	2.528	H5-180	H59-180	J5-180	H6-180	H60-180	J6-180
189	2.6249	2.653	H5-189	H59-189	J5-189	H6-189	H60-189	J6-189
198	2.7499	2.778	H5-198	H59-198	J5-198	H6-198	H60-198	J6-198
207	2.8750	2.903	H5-207	H59-207	J5-207	H6-207	H60-207	J6-207
216	3.0000	3.028	H5-216	H59-216	J5-216	H6-216	H60-216	J6-216
234	3.2500	3.278	—	—	J5-234	—	—	J6-234
252	3.5000	3.528	—	—	J5-252	—	—	J6-252
270	3.7500	3.778	—	—	J5-270	—	—	J6-270
288	4.0000	4.028	—	—	J5-288	—	—	J6-288
297	4.1250	4.153	—	—	J5-297	—	—	J6-297

Other Size Bores Available, Consult Factory.

For Gear Hubs See Pages 12-67 & 12-68

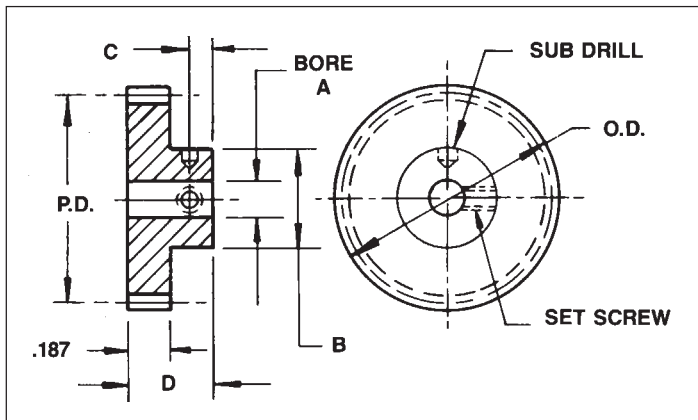
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# SPUR GEAR-72 PITCH — 3/16" Face Width ■ 20° Pressure Angle

Pin Hub — 3/16", 1/4" Bores



Material: 303 Stainless Steel  
2024-T4 Aluminum  
(Anodized Before Cutting)

Dimen.	Bore	
	3/16	1/4
A	.1873	.2498
B	.375	.500
C	.11	.12
D	.406	.437
Set Screw	#4-40	#6-32

Tolerances	Q10	Q12	Q14
<b>Bore</b>	+ .0005 - .0000	+ .0003 - .0000	+ .0002 - .0000
<b>Pitch Diameter</b>	+ .000 - .001	+ .0000 - .0007	+ .0000 - .0005
<b>Outside Diameter</b>	+ .000 - .002	+ .0000 - .0015	+ .000 - .001
<b>Total Composite Tolerance</b>	FOR AGMA QUALITY STANDARDS		
<b>Tooth to Tooth Tolerance</b>	SEE PAGE 12-2		

To order AGMA 12 Gears, add - Q12 to Part No.  
To order AGMA 14 Gears, add - Q14 to Part No.

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

Gear Data			Stainless Steel Part No. Bore Size		Aluminum Part No. Bore Size	
No. Teeth	P.D.	O.D.	.1873	.2498	.1873	.2498
30	.4166	.444	G23-30	—	G24-30	—
32	.4444	.472	G23-32	—	G24-32	—
34	.4722	.500	G23-34	—	G24-34	—
36	.5000	.528	G23-36	—	G24-36	—
38	.5277	.556	G23-38	—	G24-38	—
40	.5555	.583	G23-40	G25-40	G24-40	G26-40
42	.5833	.611	G23-42	G25-42	G24-42	G26-42
44	.6111	.639	G23-44	G25-44	G24-44	G26-44
45	.6250	.653	G23-45	G25-45	G24-45	G26-45
46	.6388	.667	G23-46	G25-46	G24-46	G26-46
48	.6666	.694	G23-48	G25-48	G24-48	G26-48
50	.6944	.722	G23-50	G25-50	G24-50	G26-50
54	.7500	.778	G23-54	G25-54	G24-54	G26-54
55	.7638	.792	G23-55	G25-55	G24-55	G26-55
56	.7777	.806	G23-56	G25-56	G24-56	G26-56
60	.8333	.861	G23-60	G25-60	G24-60	G26-60
63	.8750	.903	G23-63	G25-63	G24-63	G26-63
64	.8888	.917	G23-64	G25-64	G24-64	G26-64
70	.9722	1.000	G23-70	G25-70	G24-70	G26-70
72	1.0000	1.028	G23-72	G25-72	G24-72	G26-72
75	1.0416	1.069	G23-75	G25-75	G24-75	G26-75
80	1.1111	1.139	G23-80	G25-80	G24-80	G26-80
81	1.1250	1.153	G23-81	G25-81	G24-81	G26-81
84	1.1666	1.194	G23-84	G25-84	G24-84	G26-84
85	1.1805	1.208	G23-85	G25-85	G24-85	G26-85
90	1.2500	1.278	G23-90	G25-90	G24-90	G26-90
92	1.2777	1.306	G23-92	G25-92	G24-92	G26-92
95	1.3194	1.347	G23-95	G25-95	G24-95	G26-95
96	1.3333	1.361	G23-96	G25-96	G24-96	G26-96
99	1.3750	1.403	G23-99	G25-99	G24-99	G26-99
100	1.3888	1.417	G23-100	G25-100	G24-100	G26-100
105	1.4583	1.486	G23-105	G25-105	G24-105	G26-105
108	1.5000	1.528	G23-108	G25-108	G24-108	G26-108
110	1.5277	1.556	G23-110	G25-110	G24-110	G26-110
117	1.6249	1.653	G23-117	G25-117	G24-117	G26-117
120	1.6666	1.694	G23-120	G25-120	G24-120	G26-120
126	1.7499	1.778	G23-126	G25-126	G24-126	G26-126
127	1.7638	1.792	G23-127	G25-127	G24-127	G26-127
130	1.8055	1.833	G23-130	G25-130	G24-130	G26-130
135	1.8749	1.903	G23-135	G25-135	G24-135	G26-135
140	1.9444	1.972	G23-140	G25-140	G24-140	G26-140
144	2.0000	2.028	G23-144	G25-144	G24-144	G26-144
150	2.0833	2.111	G23-150	G25-150	G24-150	G26-150
153	2.1249	2.153	G23-153	G25-153	G24-153	G26-153
160	2.2222	2.250	G23-160	G25-160	G24-160	G26-160
162	2.2499	2.278	G23-162	G25-162	G24-162	G26-162
180	2.5000	2.528	G23-180	G25-180	G24-180	G26-180
198	2.7499	2.778	G23-198	G25-198	G24-198	G26-198
216	3.0000	3.028	G23-216	G25-216	G24-216	G26-216
234	3.2500	3.278	G23-234	G25-234	G24-234	G26-234
252	3.5000	3.528	G23-252	G25-252	G24-252	G26-252
270	3.7500	3.778	G23-270	G25-270	G24-270	G26-270
288	4.0000	4.028	G23-288	G25-288	G24-288	G26-288

Other Size Bores Available. Consult Factory.

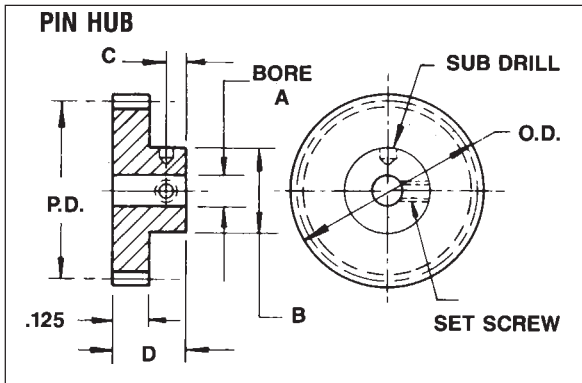
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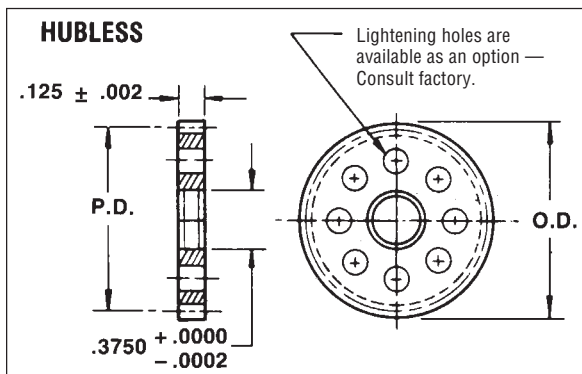
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# SPUR GEAR-80 PITCH — 1/8" Face Width ■ 20° Pressure Angle

Pin Hub — 1/8", 3/16" Bores ■ Hubless 3/8" Bore



Dimen.	Bore	
	1/8	3/16
A	.1248	.1873
B	.312	.375
C	.09	.11
D	.312	.343
Set Screw	#2-56	#4-40



Gear Data			Stainless Steel Part No. Bore Size			Aluminum Part No. Bore Size		
No. Teeth	P.D.	O.D.	Pin Hub		Hubless	Pin Hub		Hubless
			.1248	.1873	.3750	.1248	.1873	.3750
30	.3750	.400	G45-30	—	—	G46-30	—	—
32	.4000	.425	G45-32	—	—	G46-32	—	—
34	.4250	.450	G45-34	—	—	G46-34	—	—
35	.4375	.463	G45-35	—	—	G46-35	—	—
36	.4500	.475	G45-36	—	—	G46-36	—	—
38	.4750	.500	G45-38	G47-38	—	G46-38	G48-38	—
40	.5000	.525	G45-40	G47-40	—	G46-40	G48-40	—
42	.5250	.550	G45-42	G47-42	—	G46-42	G48-42	—
44	.5500	.575	G45-44	G47-44	—	G46-44	G48-44	—
45	.5625	.588	G45-45	G47-45	—	G46-45	G48-45	—
50	.6250	.650	G45-50	G47-50	J25-50	G46-50	G48-50	J26-50
55	.6875	.713	G45-55	G47-55	J25-55	G46-55	G48-55	J26-55
60	.7500	.775	G45-60	G47-60	J25-60	G46-60	G48-60	J26-60
65	.8125	.838	G45-65	G47-65	J25-65	G46-65	G48-65	J26-65
70	.8750	.900	G45-70	G47-70	J25-70	G46-70	G48-70	J26-70
75	.9375	.963	G45-75	G47-75	J25-75	G46-75	G48-75	J26-75
80	1.0000	1.025	G45-80	G47-80	J25-80	G46-80	G48-80	J26-80
85	1.0625	1.088	G45-85	G47-85	J25-85	G46-85	G48-85	J26-85
90	1.1250	1.150	G45-90	G47-90	J25-90	G46-90	G48-90	J26-90
100	1.2500	1.275	G45-100	G47-100	J25-100	G46-100	G48-100	J26-100
110	1.3750	1.400	G45-110	G47-110	J25-110	G46-110	G48-110	J26-110
120	1.5000	1.525	G45-120	G47-120	J25-120	G46-120	G48-120	J26-120
127	1.5875	1.613	G45-127	G47-127	J25-127	G46-127	G48-127	J26-127
130	1.6250	1.650	G45-130	G47-130	J25-130	G46-130	G48-130	J26-130
140	1.7500	1.775	G45-140	G47-140	J25-140	G46-140	G48-140	J26-140
150	1.8750	1.900	—	G47-150	J25-150	—	G48-150	J26-150
160	2.0000	2.025	—	G47-160	J25-160	—	G48-160	J26-160
170	2.1250	2.150	—	G47-170	J25-170	—	G48-170	J26-170
180	2.2500	2.275	—	G47-180	J25-180	—	G48-180	J26-180
190	2.3750	2.400	—	G47-190	J25-190	—	G48-190	J26-190
200	2.5000	2.525	—	G47-200	J25-200	—	G48-200	J26-200
220	2.7500	2.775	—	—	J25-220	—	—	J26-220

Other Size Bores Available, Consult Factory.

For Gear Hubs See Pages 12-67 & 12-68

Material: 303 Stainless Steel  
2024-T4 Aluminum  
(Anodized Before Cutting)

Tolerances	Q10	Q12	Q14
Bore	+ .0005 - .0000	+ .0003 - .0000	+ .0002 - .0000
Pitch Diameter	+ .000 - .001	+ .0000 - .0007	+ .0000 - .0005
Outside Diameter	+ .000 - .002	+ .0000 - .0015	+ .000 - .001
Total Composite Tolerance	FOR AGMA QUALITY STANDARDS		
Tooth to Tooth Tolerance	SEE PAGE 12-2		

To order AGMA 12 Gears, add — Q12 to Part No.  
To order AGMA 14 Gears, add — Q14 to Part No.

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

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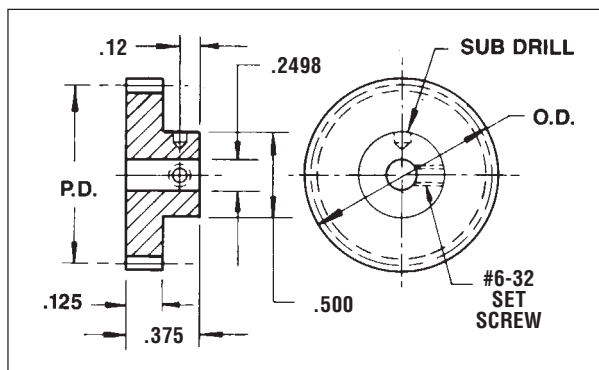
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# SPUR GEAR-80 PITCH — 1/8" Face Width ■ 20° Pressure Angle

Pin Hub — 1/4" Bore



Material: 303 Stainless Steel  
2024-T4 Aluminum  
(Anodized Before Cutting)

Tolerances	Q10	Q12	Q14
<b>Bore</b>	+ .0005 - .0000	+ .0003 - .0000	+ .0002 - .0000
<b>Pitch Diameter</b>	+ .000 - .001	+ .0000 - .0007	+ .0000 - .0005
<b>Outside Diameter</b>	+ .000 - .002	+ .0000 - .0015	+ .000 - .001
<b>Total Composite Tolerance</b>	FOR AGMA QUALITY STANDARDS		
<b>Tooth to Tooth Tolerance</b>	SEE PAGE 12-2		

To order AGMA 12 Gears, add — Q12 to Part No.  
To order AGMA 14 Gears, add — Q14 to Part No.

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

Gear Data			Stainless Steel	Aluminum
No. Teeth	P.D.	O.D.	Part No.	Part No.
25*	0.3125	0.338	80T25S	80T25A
26*	0.3250	0.350	80T26S	80T26A
27*	0.3375	0.363	80T27S	80T27A
28*	0.3500	0.375	80T28S	80T28A
29*	0.3625	0.388	80T29S	80T29A
30*	0.3750	0.400	80T30S	80T30A
32*	0.4000	0.425	80T32S	80T32A
33*	0.4125	0.438	80T33S	80T33A
34*	0.4250	0.450	80T34S	80T34A
35*	0.4375	0.463	80T35S	80T35A
36*	0.4500	0.475	80T36S	80T36A
38*	0.4750	0.500	80T38S	80T38A
39*	0.4875	0.513	80T39S	80T39A
40*	0.5000	0.525	80T40S	80T40A
41*	0.5125	0.538	80T41S	80T41A
42*	0.5250	0.550	80T42S	80T42A
44	0.5500	0.575	80T44S	80T44A
45	0.5625	0.588	80T45S	80T45A
50	0.6250	0.650	80T50S	80T50A
55	0.6875	0.713	80T55S	80T55A
60	0.7500	0.775	80T60S	80T60A
65	0.8125	0.838	80T65S	80T65A
70	0.8750	0.900	80T70S	80T70A
75	0.9375	0.963	80T75S	80T75A
80	1.0000	1.025	80T80S	80T80A
85	1.0625	1.088	80T85S	80T85A
90	1.1250	1.150	80T90S	80T90A
100	1.2500	1.275	80T100S	80T100A
110	1.3750	1.400	80T110S	80T110A
120	1.5000	1.525	80T120S	80T120A
130	1.6250	1.650	80T130S	80T130A
140	1.7500	1.775	80T140S	80T140A
150	1.8750	1.900	80T150S	80T150A
160	2.0000	2.025	80T160S	80T160A
170	2.1250	2.150	80T170S	80T170A
180	2.2500	2.275	80T180S	80T180A
190	2.3750	2.400	80T190S	80T190A
200	2.5000	2.525	80T200S	80T200A
210	2.6250	2.650	80T210S	80T210A
220	2.7500	2.775	80T220S	80T220A

Other Bore Sizes Available. Consult Factory.

\* Hob cuts into hub.

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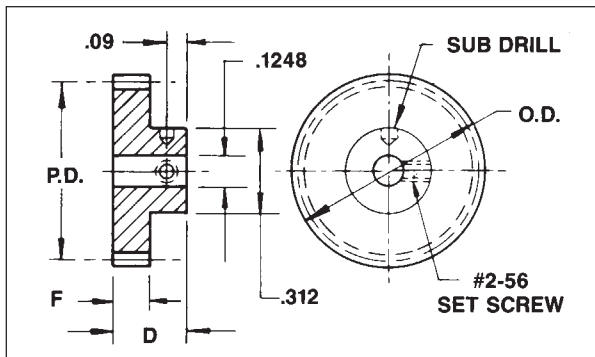
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[sales@electromate.com](mailto:sales@electromate.com)

# SPUR GEAR-96 PITCH — 1/16", 3/32", 1/8" Face Width ■ 20° Pressure Angle

Pin Hub — 1/8" Bore



Material: 303 Stainless Steel  
2024-T4 Aluminum  
(Anodized Before Cutting)

Dimen.	Face Width		
	1/16	3/32	1/8
<b>D</b>	.250	.281	.312
<b>F</b>	.062	.093	.125

Tolerances	Q10	Q12	Q14
<b>Bore</b>	+ .0005 - .0000	+ .0003 - .0000	+ .0002 - .0000
<b>Pitch Diameter</b>	+ .000 - .001	+ .0000 - .0007	+ .0000 - .0005
<b>Outside Diameter</b>	+ .000 - .002	+ .0000 - .0015	+ .000 - .001
<b>Total Composite Tolerance</b>	FOR AGMA QUALITY STANDARDS SEE PAGE 12-2		
<b>Tooth to Tooth Tolerance</b>	FOR AGMA QUALITY STANDARDS SEE PAGE 12-2		

To order AGMA 12 Gears, add - Q12 to Part No.  
To order AGMA 14 Gears, add - Q14 to Part No.

Gear Data			Stainless Steel Part No. Face Width			Aluminum Part No. Face Width		
No. Teeth	P.D.	O.D.	1/16"	3/32"	1/8"	1/16"	3/32"	1/8"
34	.3541	.375	G51-34	G27-34	G29-34	G52-34	G28-34	G30-34
36	.3750	.396	G51-36	G27-36	G29-36	G52-36	G28-36	G30-36
38	.3958	.417	G51-38	G27-38	G29-38	G52-38	G28-38	G30-38
40	.4166	.438	G51-40	G27-40	G29-40	G52-40	G28-40	G30-40
44	.4583	.479	G51-44	G27-44	G29-44	G52-44	G28-44	G30-44
46	.4791	.500	G51-46	G27-46	G29-46	G52-46	G28-46	G30-46
48	.5000	.521	G51-48	G27-48	G29-48	G52-48	G28-48	G30-48
50	.5208	.542	G51-50	G27-50	G29-50	G52-50	G28-50	G30-50
52	.5416	.563	G51-52	G27-52	G29-52	G52-52	G28-52	G30-52
54	.5625	.583	G51-54	G27-54	G29-54	G52-54	G28-54	G30-54
56	.5833	.604	G51-56	G27-56	G29-56	G52-56	G28-56	G30-56
58	.6041	.625	G51-58	G27-58	G29-58	G52-58	G28-58	G30-58
60	.6250	.646	G51-60	G27-60	G29-60	G52-60	G28-60	G30-60
64	.6666	.688	G51-64	G27-64	G29-64	G52-64	G28-64	G30-64
72	.7500	.771	G51-72	G27-72	G29-72	G52-72	G28-72	G30-72
84	.8750	.896	G51-84	G27-84	G29-84	G52-84	G28-84	G30-84
96	1.0000	1.021	G51-96	G27-96	G29-96	G52-96	G28-96	G30-96
100	1.0416	1.063	G51-100	G27-100	G29-100	G52-100	G28-100	G30-100
108	1.1250	1.146	—	G27-108	G29-108	—	G28-108	G30-108
120	1.2500	1.271	—	—	G29-120	—	—	G30-120
127	1.3229	1.344	—	—	G29-127	—	—	G30-127
132	1.3750	1.396	—	—	G29-132	—	—	G30-132
144	1.5000	1.521	—	—	G29-144	—	—	G30-144
156	1.6250	1.646	—	—	G29-156	—	—	G30-156
168	1.7500	1.771	—	—	G29-168	—	—	G30-168
180	1.8750	1.896	—	—	G29-180	—	—	G30-180
192	2.0000	2.021	—	—	G29-192	—	—	G30-192
213	2.2187	2.240	—	—	G29-213	—	—	G30-213

Other Size Bores Available, Consult Factory.

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

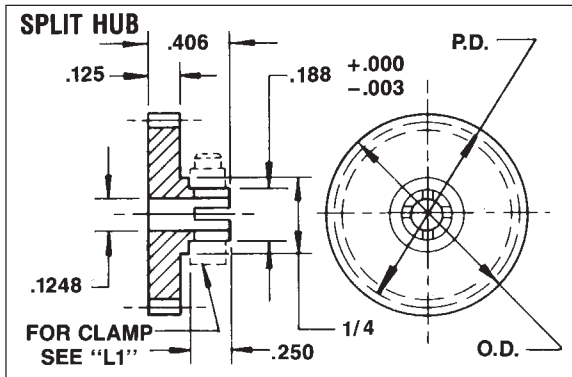
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# SPUR GEAR-96 PITCH — 1/8" Face Width ■ 20° Pressure Angle

Split Hub — 1/8" Bore



Tolerances	Q10	Q12	Q14
<b>Bore</b>	+ .0005 - .0000	+ .0003 - .0000	+ .0002 - .0000
<b>Pitch Diameter</b>	+ .000 - .001	+ .0000 - .0007	+ .0000 - .0005
<b>Outside Diameter</b>	+ .000 - .002	+ .0000 - .0015	+ .000 - .001
<b>Total Composite Tolerance</b>	FOR AGMA QUALITY STANDARDS		
<b>Tooth to Tooth Tolerance</b>	SEE PAGE 12-2		

Gear Data			Stainless Steel Part No.	Aluminum Part No.
No. Teeth	P.D.	O.D.		
32	.3333	.354	H7-32	H8-32
34	.3541	.375	H7-34	H8-34
35	.3645	.385	H7-35	H8-35
36	.3750	.396	H7-36	H8-36
38	.3958	.417	H7-38	H8-38
40	.4166	.438	H7-40	H8-40
44	.4583	.479	H7-44	H8-44
48	.5000	.521	H7-48	H8-48
50	.5208	.542	H7-50	H8-50
52	.5416	.563	H7-52	H8-52
54	.5625	.583	H7-54	H8-54
56	.5833	.604	H7-56	H8-56
58	.6041	.625	H7-58	H8-58
60	.6250	.646	H7-60	H8-60
64	.6666	.688	H7-64	H8-64
72	.7500	.771	H7-72	H8-72
84	.8750	.896	H7-84	H8-84
96	1.0000	1.021	H7-96	H8-96
100	1.0416	1.063	H7-100	H8-100
108	1.1250	1.146	H7-108	H8-108

Material: 303 Stainless Steel  
2024-T4 Aluminum  
(Anodized Before Cutting)

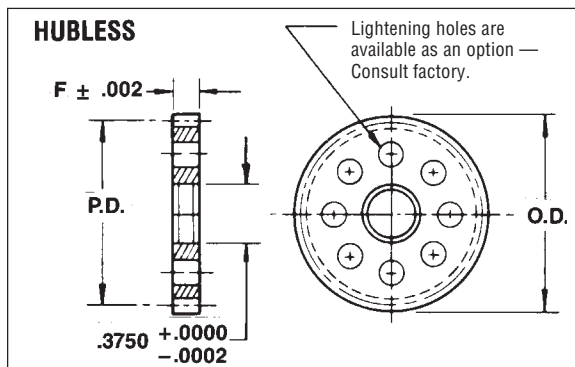
To order AGMA 12 Gears, add - Q12 to Part No.  
To order AGMA 14 Gears, add - Q14 to Part No.

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.  
Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

Other Size Bores Available, Consult Factory.

# SPUR GEAR-96 PITCH — 1/16", 1/8" Face Width ■ 20° Pressure Angle

Hubless — 3/8" Bore



Tolerances	Q10	Q12	Q14
<b>Pitch Diameter</b>	+ .000 - .001	+ .0000 - .0007	+ .0000 - .0005
<b>Outside Diameter</b>	+ .000 - .002	+ .0000 - .0015	+ .000 - .001
<b>Total Composite Tolerance</b>	FOR AGMA QUALITY STANDARDS		
<b>Tooth to Tooth Tolerance</b>	SEE PAGE 12-2		

Gear Data			Stainless Steel Part No. Face Width		Aluminum Part No. Face Width	
No. Teeth	P.D.	O.D.	1/16"	1/8"	1/16"	1/8"
58	.6041	.625	J27-58	J7-58	J28-58	J8-58
59	.6145	.635	J27-59	J7-59	J28-59	J8-59
60	.6250	.646	J27-60	J7-60	J28-60	J8-60
61	.6354	.656	J27-61	J7-61	J28-61	J8-61
62	.6458	.667	J27-62	J7-62	J28-62	J8-62
63	.6562	.677	J27-63	J7-63	J28-63	J8-63
64	.6666	.688	J27-64	J7-64	J28-64	J8-64
65	.6770	.699	J27-65	J7-65	J28-65	J8-65
66	.6875	.708	J27-66	J7-66	J28-66	J8-66
72	.7500	.771	J27-72	J7-72	J28-72	J8-72
84	.8750	.896	J27-84	J7-84	J28-84	J8-84
96	1.0000	1.021	J27-96	J7-96	J28-96	J8-96
100	1.0416	1.063	J27-100	J7-100	J28-100	J8-100
108	1.1250	1.146	J27-108	J7-108	J28-108	J8-108
116	1.2083	1.229	J27-116	J7-116	J28-116	J8-116
120	1.2500	1.271	J27-120	J7-120	J28-120	J8-120
127	1.3229	1.344	J27-127	J7-127	J28-127	J8-127
132	1.3750	1.396	J27-132	J7-132	J28-132	J8-132
144	1.5000	1.521	J27-144	J7-144	J28-144	J8-144
156	1.6250	1.646	J27-156	J7-156	J28-156	J8-156
168	1.7500	1.771	J27-168	J7-168	J28-168	J8-168
180	1.8750	1.896	J27-180	J7-180	J28-180	J8-180
192	2.0000	2.021	J27-192	J7-192	J28-192	J8-192
216	2.2500	2.271	J27-216	J7-216	J28-216	J8-216
228	2.3750	2.396	J27-228	J7-228	J28-228	J8-228
240	2.5000	2.521	—	J7-240	—	J8-240
264	2.7500	2.771	—	J7-264	—	J8-264
288	3.0000	3.021	—	J7-288	—	J8-288
336	3.5000	3.521	—	J7-336	—	J8-336
384	4.0000	4.021	—	J7-384	—	J8-384

Material: 303 Stainless Steel  
2024-T4 Aluminum  
(Anodized Before Cutting)

To order AGMA 12 Gears, add - Q12 to Part No.  
To order AGMA 14 Gears, add - Q14 to Part No.

Dimen.	Face Width	
	1/16	1/8
F	.062	.125

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.  
Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

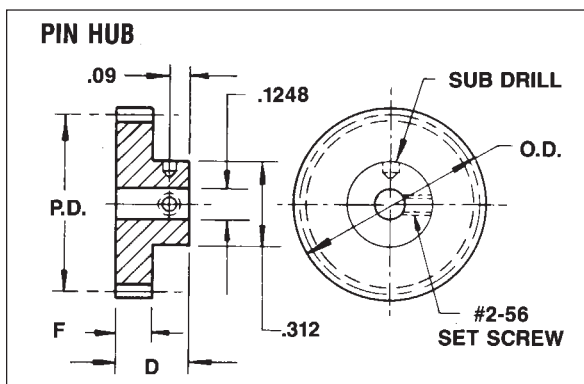
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For Gear Hubs See Pages 12-67 & 12-68

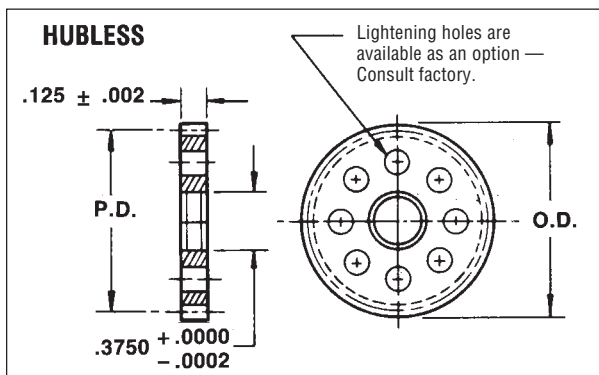
Other Size Bores Available, Consult Factory.

# SPUR GEAR-120 PITCH — 1/16", 3/32", 1/8" Face Width ■ 20° Pressure Angle

Pin Hub — 1/8" Bore ■ Hubless 3/8" Bore



Dimen.	Face Width	
	1/16	3/32
D	.250	.281
F	.062	.093



Gear Data			Stainless Steel Part No. Face Width			Aluminum Part No. Face Width		
No. Teeth	P.D.	O.D.	Pin Hub		Hubless	Pin Hub		Hubless
			1/16"	3/32"	1/8"	1/16"	3/32"	1/8"
42	.3500	.367	G55-42	G35-42	—	G56-42	G36-42	—
45	.3750	.392	G55-45	G35-45	—	G56-45	G36-45	—
48	.4000	.417	G55-48	G35-48	—	G56-48	G36-48	—
54	.4500	.467	G55-54	G35-54	—	G56-54	G36-54	—
60	.5000	.517	G55-60	G35-60	—	G56-60	G36-60	—
66	.5500	.567	G55-66	G35-66	—	G56-66	G36-66	—
72	.6000	.617	G55-72	G35-72	J9-72	G56-72	G36-72	J10-72
78	.6500	.667	G55-78	G35-78	J9-78	G56-78	G36-78	J10-78
84	.7000	.717	G55-84	G35-84	J9-84	G56-84	G36-84	J10-84
90	.7500	.767	G55-90	G35-90	J9-90	G56-90	G36-90	J10-90
96	.8000	.817	G55-96	G35-96	J9-96	G56-96	G36-96	J10-96
102	.8500	.867	G55-102	G35-102	J9-102	G56-102	G36-102	J10-102
108	.9000	.917	G55-108	G35-108	J9-108	G56-108	G36-108	J10-108
114	.9500	.967	G55-114	G35-114	J9-114	G56-114	G36-114	J10-114
120	1.0000	1.017	G55-120	G35-120	J9-120	G56-120	G36-120	J10-120
126	1.0500	1.067	G55-126	G35-126	J9-126	G56-126	G36-126	J10-126
127	1.0583	1.075	G55-127	G35-127	J9-127	G56-127	G36-127	J10-127
132	1.1000	1.117	G55-132	G35-132	J9-132	G56-132	G36-132	J10-132
138	1.1500	1.167	—	G35-138	J9-138	—	G36-138	J10-138
144	1.2000	1.217	—	G35-144	J9-144	—	G36-144	J10-144
150	1.2500	1.267	—	G35-150	J9-150	—	G36-150	J10-150
156	1.3000	1.317	—	G35-156	J9-156	—	G36-156	J10-156
162	1.3500	1.367	—	G35-162	J9-162	—	G36-162	J10-162
168	1.4000	1.417	—	—	J9-168	—	—	J10-168
174	1.4500	1.467	—	—	J9-174	—	—	J10-174
180	1.5000	1.517	—	—	J9-180	—	—	J10-180

Other Size Bores Available. Consult Factory.

For Gear Hubs See Pages 12-67 & 12-68

Material: 303 Stainless Steel  
2024-T4 Aluminum  
(Anodized Before Cutting)

Tolerances	Q10	Q12	Q14
Bore	+ .0005 - .0000	+ .0003 - .0000	+ .0002 - .0000
Pitch Diameter	+ .000 - .001	+ .0000 - .0007	+ .0000 - .0005
Outside Diameter	+ .000 - .002	+ .0000 - .0015	+ .000 - .001
Total Composite Tolerance	FOR AGMA QUALITY STANDARDS		
Tooth to Tooth Tolerance	SEE PAGE 12-2		

To order AGMA 12 Gears, add — Q12 to Part No.  
To order AGMA 14 Gears, add — Q14 to Part No.

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth at the end of the Part Number.

Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

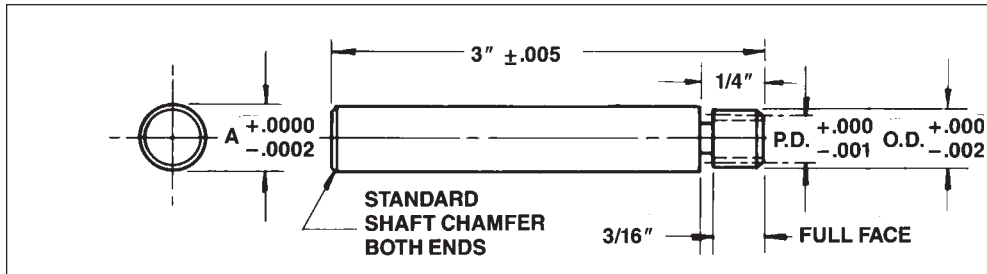
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# PRECISION PINION SHAFTS — 1/8", 3/16", 1/4" Shaft Diameter ■ 3/16" Face Width

20° Pressure Angle ■ Agma Quality No. 10 ■ P.D. Less Than Shaft Diameter



Material: 303 Stainless Steel

A	Pitch	No. Teeth	P. D.	O. D.	Part No.
.1247 (1/8)	96	10	.1042	.125	F4-1
	120	12	.1000	.116	F4-2
	200	18	.0900	.100	F4-3
	200	20	.1000	.110	F4-4
.1872 (3/16)	72	10	.1388	.166	F5-1
	80	10	.1250	.150	F5-6
	96	10	.1042	.125	F5-2
	96	12	.1250	.146	F5-4
	96	14	.1458	.166	F5-5

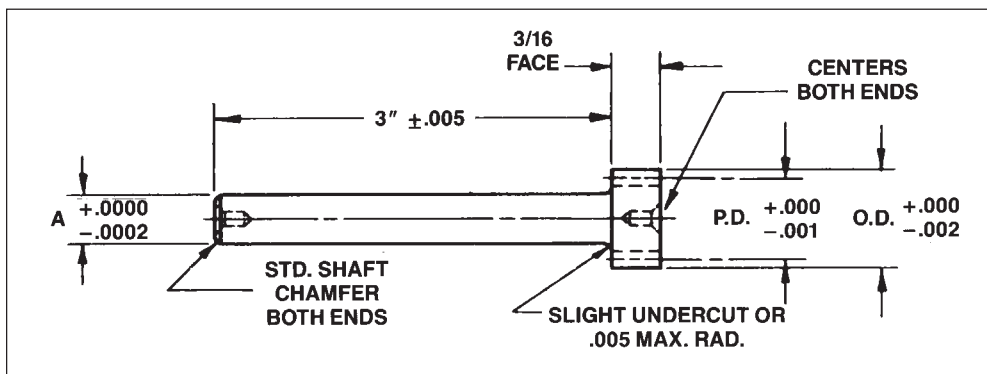
A	Pitch	No. Teeth	P. D.	O. D.	Part No.
.2497 (1/4)	48	10	.2083	.250	F6-1
	64	12	.1875	.219	F6-2
	64	14	.2187	.250	F6-3
	72	14	.1944	.222	F6-4
	72	16	.2222	.250	F6-5
	80	10	.1250	.150	F6-8
	80	12	.1500	.175	F6-9
	96	16	.1666	.187	F6-6
	96	18	.1875	.208	F6-7

Other Lengths and/or Teeth Available, Consult Factory.

Centers at PIC option

# PRECISION PINION SHAFTS — 1/8", 3/16", 1/4" Shaft Diameter ■ 3/16" Face Width

20° Pressure Angle ■ Agma Quality No. 10 ■ P.D. Greater Than Shaft Diameter



Material: 303 Stainless Steel

A	Pitch	No. Teeth	P. D.	O. D.	Part No.
.1247 (1/8)	64	16	.2500	.281	*F7-1
	96	24	.2500	.271	*F7-6
.1872 (3/16)	48	12	.2500	.291	*F8-1
	48	18	.3750	.416	*F8-2
	64	16	.2500	.281	*F8-3
	72	18	.2500	.278	*F8-5
	80	20	.2500	.275	*F8-7

A	Pitch	No. Teeth	P. D.	O. D.	Part No.
.2497 (1/4)	24	12	.5000	.583	F9-1
	32	16	.5000	.562	F9-2
	48	12	.2500	.291	F9-3
	48	18	.3750	.416	*F9-4
	64	16	.2500	.281	*F9-5
	64	20	.3125	.343	*F9-6
	64	24	.3750	.406	*F9-7
	1/10	10	.3183	.3820	F9-8

Other Lengths and/or Teeth Available, Consult Factory.

Centers at PIC option

\*Q12 and Q14 Tolerances Available on Request.

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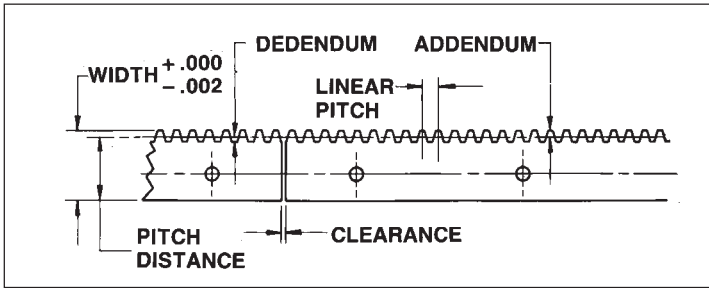
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# FINE PITCH RACK DATA — 24 to 120 Pitch

Terminology



## AVAILABLE PITCHES AND TOOTH DATA

Pitch	Linear Pitch	Addendum	Dedendum	Whole Depth
24	.1309	.0417	.0520	.0937
1/10	.1000	.0318	.0402	.0720
32	.0982	.0313	.0395	.0708
48	.0654	.0208	.0270	.0478
64	.0491	.0156	.0208	.0364
72	.0436	.0139	.0187	.0326
80	.0393	.0125	.0170	.0295
96	.0327	.0104	.0145	.0249
120	.0262	.0083	.0120	.0203

## MATERIALS

**Standard:** 416 Stainless-Stress relieved, not heat treated  
2024-T4 Aluminum (Anodized).

**Available on Request:** Stainless, Carbon & Alloy Steels,  
Non-Ferrous & Non-Metallic Materials.

## FINISHES

Hardened, Nitrided, Anodizes.

## LENGTHS

Available Up To 36"

## FACE WIDTHS

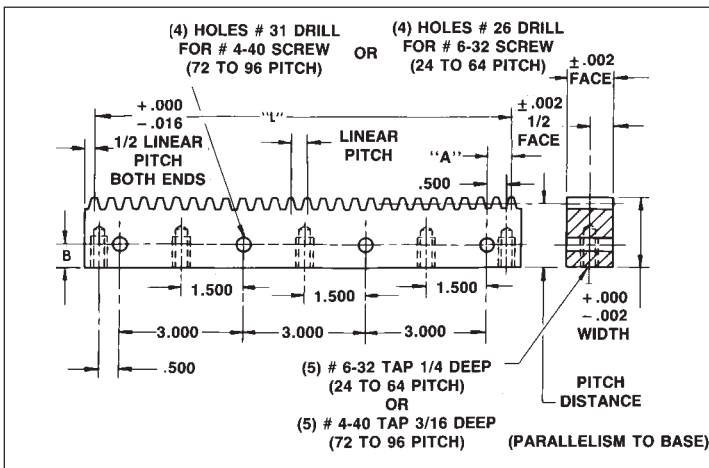
Available Up To 2"

## PIC CLASSIFICATIONS AND TOLERANCES

PIC Class Rack	MAXIMUM SPACING ERROR		Parallelism To Base
	Tooth-to-Tooth	Accumulated in 11"	
PREC. 1	.0005	.002	.001
PREC. 2	.0004	.001	.0007
PREC. 3	.0002	.0006	.0005

# FINE PITCH RACK DATA — 24 to 96 Pitch

20° Pressure Angle ■ PIC Prec. 1, 2, 3



**Material:**  
416 Stainless Steel  
Stress Relieved  
Ground on all Sides

RACK DATA								Part No.
Pitch	L	Pitch Distance	Face	Width	Linear Pitch	A	B	
24	10.9956	.4383	.230	.480	.1309	.998	.218	AG-31
1/10	10.9000	.4482	.230	.480	.1000	.950	.218	AG-32
32	10.9956	.4487	.230	.480	.0982	.998	.218	AG-33
48	10.9956	.4592	.230	.480	.0654	.998	.218	AG-34
64	10.9956	.4644	.230	.480	.0491	.998	.218	AG-35
72	10.9956	.3411	.167	.355	.0436	.998	.156	AG-36
96	10.9956	.3446	.167	.355	.0327	.998	.156	AG-38

To order PREC. 2 Racks, add-P2 to Part No.  
To order PREC. 3 Racks, add-P3 to Part No.

Tolerances	P1	P2	P3
Pitch Distance	+.000 -.001	+.0000 -.0007	+.0000 -.0005
Tooth to Tooth	.0005	.0004	.0002
Total Composite	.002	.001	.0006

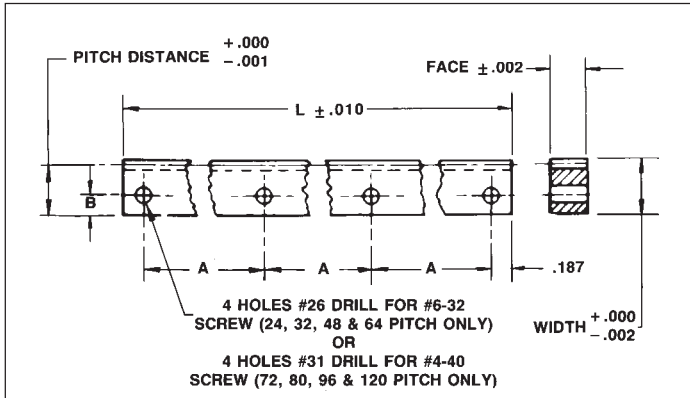
Total Composite—Max. Spacing Error Accumulated in 11".

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# FINE PITCH RACKS — 24 to 120 Pitch ■ 20° Pressure Angle

3" to 10" Lengths ■ PIC Prec. 1



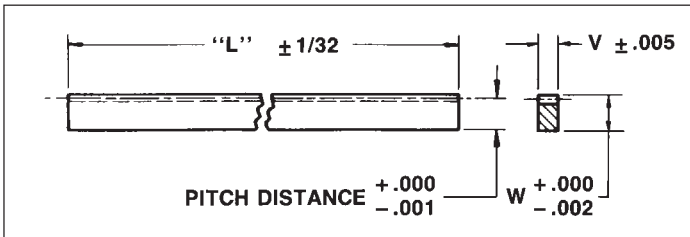
Material: 416 Stainless Steel  
2024-T4 Aluminum (Anodized)

Pitch	L	Pitch Distance	Face	Width	A	B	Material	Part No.
24	10	.4383	.230	.480	3.208	.218	Stainless Aluminum	AG-9 AG-100
32	10	.4487	.230	.480	3.208	.218	Stainless Aluminum	AG-110 AG-120
48	9	.4592	.230	.480	2.875	.218	Stainless Aluminum	AG-1 AG-2
64	7	.4644	.230	.480	2.208	.218	Stainless Aluminum	AG-3 AG-4
72	5	.3411	.167	.355	1.541	.156	Stainless Aluminum	AG-5 AG-6
80	5	.3425	.167	.355	1.541	.156	Stainless Aluminum	AG-130 AG-140
96	3	.3446	.167	.355	.875	.156	Stainless Aluminum	AG-7 AG-8
120	3	.3467	.167	.355	.875	.156	Stainless Aluminum	AG-150 AG-160

For Longer Racks, See AG-31 to AG-36.

# FINE PITCH RACKS — 24 to 120 Pitch ■ 20° Pressure Angle

Rectangular Stock ■ PIC Prec. 1



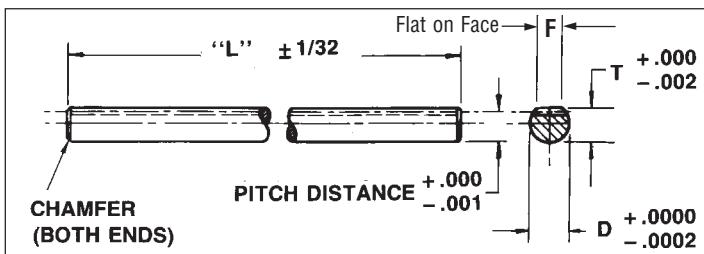
Material: 416 Stainless Steel \*

\*Available in Delrin with P.D. & W tolerance of +.000 / -.005  
Part Numbers: AG-10D, AG-11D, AG-12D, AG-13D

Pitch	L	Pitch Distance	V	W	Part No.
24	18	.438	.230	.480	AG-10*
32	18	.449	.230	.480	AG-11*
48	18	.459	.230	.480	AG-12*
64	11	.464	.230	.480	AG-13*
72	11	.341	.167	.355	AG-14
96	11	.344	.167	.355	AG-15
120	11	.347	.167	.355	AG-16

# FINE PITCH RACKS — 24 to 120 Pitch ■ 20° Pressure Angle

Round Stock ■ PIC Prec. 1



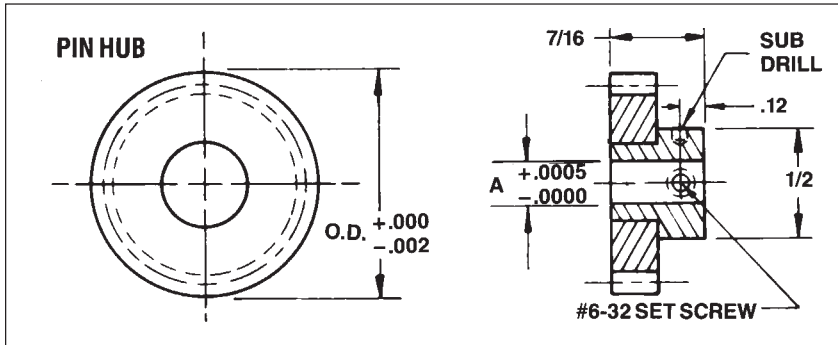
Material: 416 Stainless Steel \*

\*Available in Delrin with P.D. & T tolerance of +.000 / -.005 and D tolerance of +.002 / -.000  
Part Number: AG-17D

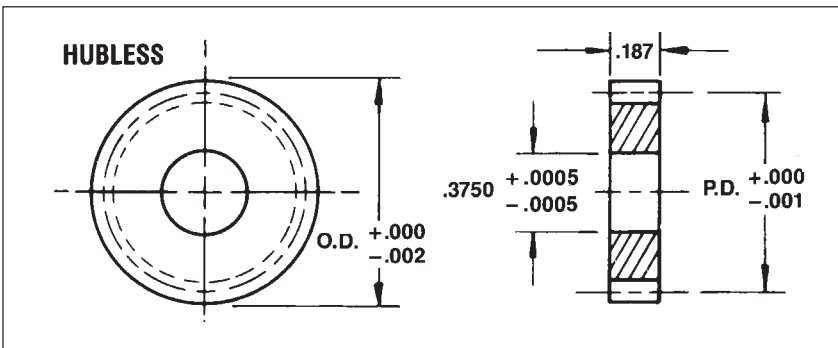
Pitch	L	Pitch Distance	F	D	T	Part No.
24	18	.438	3/16	.4997	.480	AG-17*
32	18	.309	3/16	.3747	.340	AG-18
48	18	.199	5/32	.2497	.220	AG-19
64	11	.204	5/32	.2497	.220	AG-20
72	11	.142	1/8	.1872	.156	AG-21
96	11	.145	1/8	.1872	.156	AG-22
120	11	.107	3/32	.1247	.115	AG-23

# DELRIN® SPUR GEAR-24 PITCH — 3/16" Face Width ■ 20° Pressure Angle

Stainless Steel Pin Hub — 3/16", 1/4" Bores ■ Hubless — 3/8" Bore



Dimen.	Bore	
	3/16	1/4
A	.1873	.2498



Gear — Acetal (Delrin® or Celcon®)  
Hub — 303 Stainless Steel

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

Gear Data			Pin Hub Part No. Bore Size		Hubless Part No. Bore Size
No. Teeth	P.D.	O.D.	.1873	.2498	.3750
15	.6250	.708	AB14-15	AB15-15	AB13-15
16	.6667	.750	AB14-16	AB15-16	AB13-16
17	.7083	.792	AB14-17	AB15-17	AB13-17
18	.7500	.833	AB14-18	AB15-18	AB13-18
19	.7917	.875	AB14-19	AB15-19	AB13-19
20	.8333	.917	AB14-20	AB15-20	AB13-20
21	.8750	.958	AB14-21	AB15-21	AB13-21
22	.9167	1.000	AB14-22	AB15-22	AB13-22
23	.9583	1.042	AB14-23	AB15-23	AB13-23
24	1.0000	1.083	AB14-24	AB15-24	AB13-24
25	1.0417	1.125	AB14-25	AB15-25	AB13-25
28	1.1667	1.250	AB14-28	AB15-28	AB13-28
30	1.2500	1.333	AB14-30	AB15-30	AB13-30
32	1.3333	1.417	AB14-32	AB15-32	AB13-32
33	1.3750	1.458	AB14-33	AB15-33	AB13-33
36	1.5000	1.583	AB14-36	AB15-36	AB13-36
40	1.6667	1.750	AB14-40	AB15-40	AB13-40
42	1.7500	1.833	AB14-42	AB15-42	AB13-42
45	1.8750	1.958	AB14-45	AB15-45	AB13-45
46	1.9167	2.000	AB14-46	AB15-46	AB13-46
48	2.0000	2.083	AB14-48	AB15-48	AB13-48
50	2.0833	2.167	AB14-50	AB15-50	AB13-50
52	2.1667	2.250	AB14-52	AB15-52	AB13-52
55	2.2917	2.375	AB14-55	AB15-55	AB13-55
56	2.3333	2.417	AB14-56	AB15-56	AB13-56
57	2.3750	2.458	AB14-57	AB15-57	AB13-57
60	2.5000	2.583	AB14-60	AB15-60	AB13-60
64	2.6667	2.750	AB14-64	AB15-64	AB13-64
66	2.7500	2.833	AB14-66	AB15-66	AB13-66
69	2.8750	2.958	AB14-69	AB15-69	AB13-69

Other Size Bores Available, Consult Factory.

For Gear Hubs See Pages 12-67 & 12-68

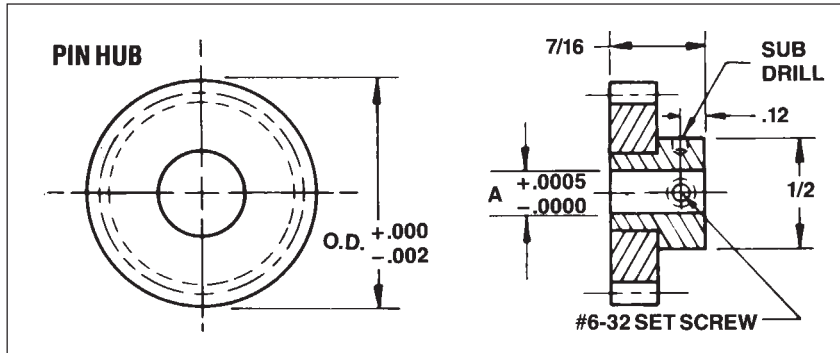
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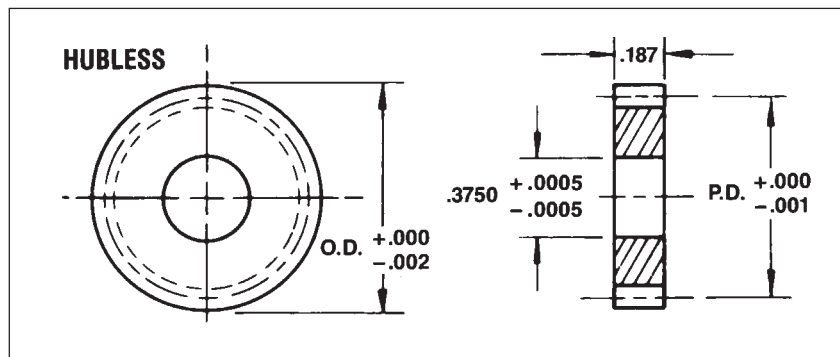
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# DELTRIN® SPUR GEAR-32 PITCH — 3/16" Face Width ■ 20° Pressure Angle

Stainless Steel Pin Hub — 3/16", 1/4" Bores ■ Hubless — 3/8" Bore



Dimen.	Bore	
	3/16	1/4
A	.1873	.2498



Gear Data			Pin Hub Part No. Bore Size		Hubless Part No. Bore Size
No. Teeth	P.D.	O.D.	.1873	.2498	.3750
20	.6250	.688	AB17-20	AB18-20	AB16-20
21	.6563	.719	AB17-21	AB18-21	AB16-21
22	.6875	.750	AB17-22	AB18-22	AB16-22
23	.7188	.781	AB17-23	AB18-23	AB16-23
24	.7500	.813	AB17-24	AB18-24	AB16-24
25	.7813	.844	AB17-25	AB18-25	AB16-25
26	.8125	.875	AB17-26	AB18-26	AB16-26
28	.8750	.938	AB17-28	AB18-28	AB16-28
30	.9375	1.000	AB17-30	AB18-30	AB16-30
32	1.0000	1.063	AB17-32	AB18-32	AB16-32
36	1.1250	1.188	AB17-36	AB18-36	AB16-36
40	1.2500	1.313	AB17-40	AB18-40	AB16-40
42	1.3125	1.375	AB17-42	AB18-42	AB16-42
44	1.3750	1.438	AB17-44	AB18-44	AB16-44
46	1.4375	1.500	AB17-46	AB18-46	AB16-46
48	1.5000	1.563	AB17-48	AB18-48	AB16-48
50	1.5625	1.625	AB17-50	AB18-50	AB16-50
52	1.6250	1.688	AB17-52	AB18-52	AB16-52
56	1.7500	1.813	AB17-56	AB18-56	AB16-56
60	1.8750	1.938	AB17-60	AB18-60	AB16-60
63	1.9688	2.031	AB17-63	AB18-63	AB16-63
64	2.0000	2.063	AB17-64	AB18-64	AB16-64
66	2.0625	2.125	AB17-66	AB18-66	AB16-66
69	2.1563	2.219	AB17-69	AB18-69	AB16-69
72	2.2500	2.313	AB17-72	AB18-72	AB16-72
75	2.3438	2.406	AB17-75	AB18-75	AB16-75
80	2.5000	2.563	AB17-80	AB18-80	AB16-80
84	2.6250	2.688	AB17-84	AB18-84	AB16-84
88	2.7500	2.813	AB17-88	AB18-88	AB16-88
92	2.8750	2.938	AB17-92	AB18-92	AB16-92

Other Size Bores Available, Consult Factory.

For Gear Hubs See Pages 12-67 & 12-68

**Material:**

Gear — Acetal (Delrin® or Celcon®)

Hub — 303 Stainless Steel

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

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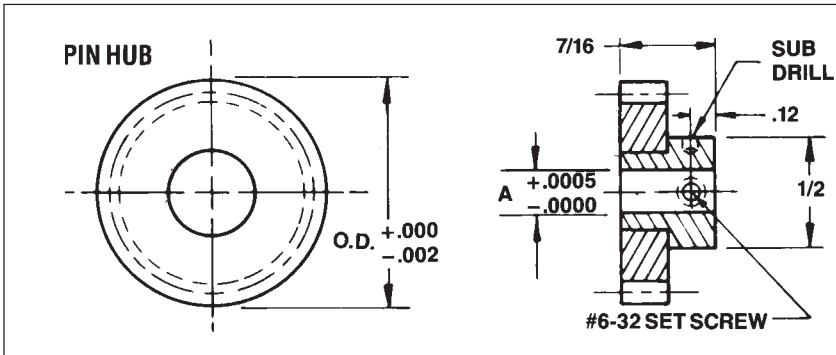
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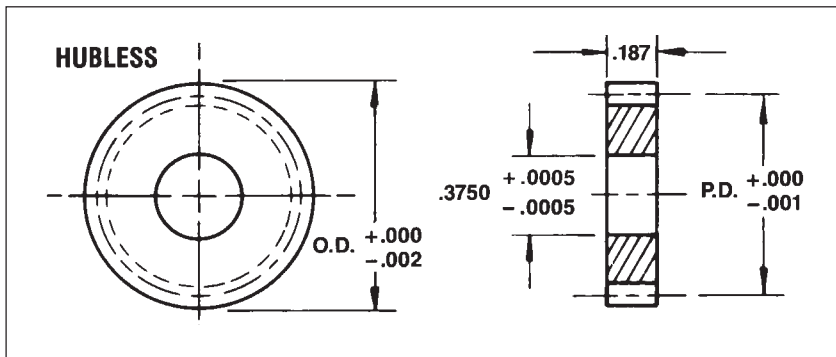
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# DELRIN® SPUR GEAR-48 PITCH — 3/16" Face Width ■ 20° Pressure Angle

Stainless Steel Pin Hub — 3/16", 1/4" Bores ■ Hubless — 3/8" Bore



Dimen.	Bore	
	3/16	1/4
A	.1873	.2498



Gear Data			Pin Hub Part No. Bore Size		Hubless Part No. Bore Size
No. Teeth	P.D.	O.D.	.1873	.2498	.3750
28	.5833	.625	AB20-28	AB21-28	AB19-28
29	.6041	.646	AB20-29	AB21-29	AB19-29
30	.6250	.667	AB20-30	AB21-30	AB19-30
32	.6666	.708	AB20-32	AB21-32	AB19-32
34	.7083	.750	AB20-34	AB21-34	AB19-34
36	.7500	.792	AB20-36	AB21-36	AB19-36
38	.7916	.833	AB20-38	AB21-38	AB19-38
40	.8333	.875	AB20-40	AB21-40	AB19-40
42	.8750	.917	AB20-42	AB21-42	AB19-42
44	.9166	.958	AB20-44	AB21-44	AB19-44
46	.9583	1.000	AB20-46	AB21-46	AB19-46
48	1.0000	1.042	AB20-48	AB21-48	AB19-48
50	1.0416	1.083	AB20-50	AB21-50	AB19-50
55	1.1458	1.188	AB20-55	AB21-55	AB19-55
56	1.1666	1.208	AB20-56	AB21-56	AB19-56
60	1.2500	1.292	AB20-60	AB21-60	AB19-60
64	1.3333	1.375	AB20-64	AB21-64	AB19-64
68	1.4166	1.458	AB20-68	AB21-68	AB19-68
72	1.5000	1.542	AB20-72	AB21-72	AB19-72
75	1.5625	1.604	AB20-75	AB21-75	AB19-75
80	1.6666	1.708	AB20-80	AB21-80	AB19-80
84	1.7500	1.792	AB20-84	AB21-84	AB19-84
90	1.8750	1.917	AB20-90	AB21-90	AB19-90
92	1.9166	1.958	AB20-92	AB21-92	AB19-92
96	2.0000	2.042	AB20-96	AB21-96	AB19-96
100	2.0833	2.125	AB20-100	AB21-100	AB19-100
110	2.2916	2.333	AB20-110	AB21-110	AB19-110
120	2.5000	2.542	AB20-120	AB21-120	AB19-120
132	2.7500	2.792	AB20-132	AB21-132	AB19-132
138	2.8750	2.917	AB20-138	AB21-138	AB19-138

Other Size Bores Available, Consult Factory.

For Gear Hubs See Pages 12-67 & 12-68

## Material:

Gear — Acetal (Delrin® or Celcon®)  
Hub — 303 Stainless Steel

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

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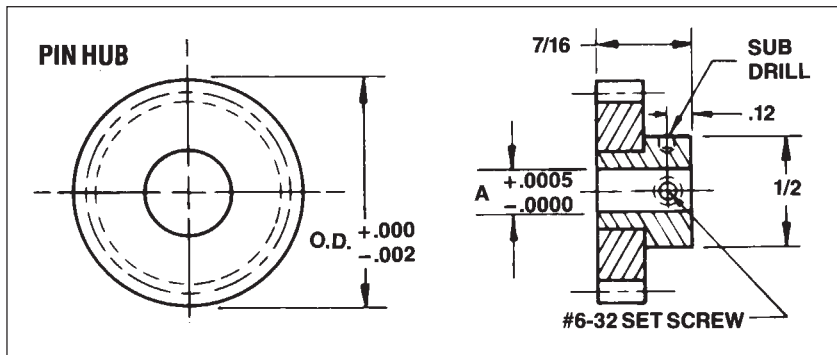
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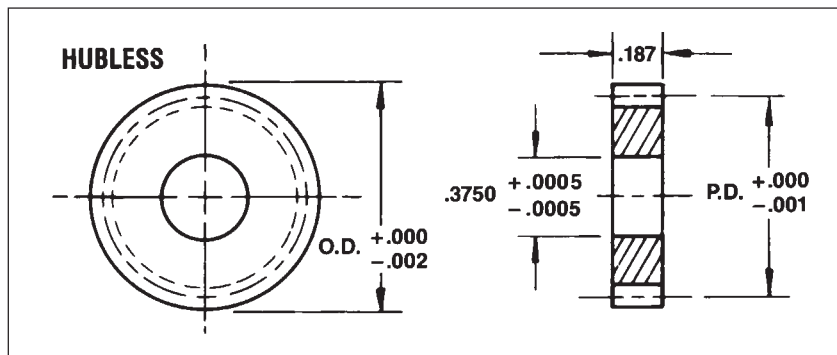


# DELRIN® SPUR GEAR-64 PITCH — 3/16" Face Width ■ 20° Pressure Angle

Stainless Steel Pin Hub — 3/16", 1/4" Bores ■ Hubless — 3/8" Bore



Dimen.	Bore	
	3/16	1/4
A	.1873	.2498



## Material:

Gear — Acetal (Delrin® or Celcon®)  
Hub — 303 Stainless Steel

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

Gear Data			Pin Hub Part No. Bore Size		Hubless Part No. Bore Size
No. Teeth	P.D.	O.D.	.1873	.2498	.3750
36	.5625	.594	AB23-36	AB24-36	AB22-36
37	.5781	.609	AB23-37	AB24-37	AB22-37
38	.5937	.625	AB23-38	AB24-38	AB22-38
40	.6250	.656	AB23-40	AB24-40	AB22-40
42	.6562	.688	AB23-42	AB24-42	AB22-42
44	.6875	.719	AB23-44	AB24-44	AB22-44
46	.7187	.750	AB23-46	AB24-46	AB22-46
48	.7500	.781	AB23-48	AB24-48	AB22-48
50	.7812	.813	AB23-50	AB24-50	AB22-50
56	.8750	.906	AB23-56	AB24-56	AB22-56
60	.9375	.969	AB23-60	AB24-60	AB22-60
64	1.0000	1.031	AB23-64	AB24-64	AB22-64
72	1.1250	1.156	AB23-72	AB24-72	AB22-72
74	1.1562	1.188	AB23-74	AB24-74	AB22-74
80	1.2500	1.281	AB23-80	AB24-80	AB22-80
84	1.3125	1.344	AB23-84	AB24-84	AB22-84
88	1.3750	1.406	AB23-88	AB24-88	AB22-88
90	1.4062	1.438	AB23-90	AB24-90	AB22-90
96	1.5000	1.531	AB23-96	AB24-96	AB22-96
100	1.5625	1.594	AB23-100	AB24-100	AB22-100
112	1.7500	1.781	AB23-112	AB24-112	AB22-112
120	1.8750	1.906	AB23-120	AB24-120	AB22-120
127	1.9843	2.016	AB23-127	AB24-127	AB22-127
128	2.0000	2.031	AB23-128	AB24-128	AB22-128
144	2.2500	2.281	AB23-144	AB24-144	AB22-144

Other Size Bores Available, Consult Factory.

For Gear Hubs See Pages 12-67 & 12-68

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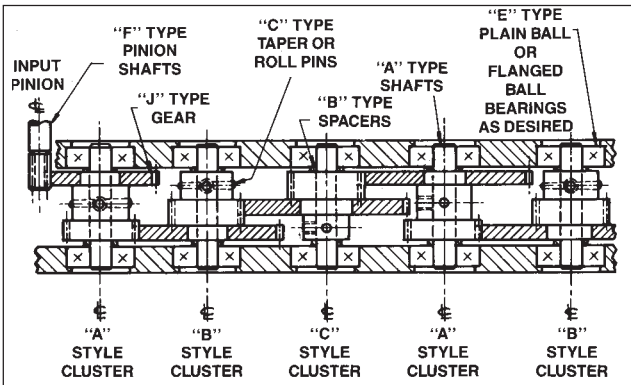
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# PRECISION CLUSTER GEARS

AGMA 10



The following PIC cluster gears have been designed to allow large gear reduction. Quickly assembled with minimum space requirements.

For continuous reductions always follow sequence of meshing. "A" style cluster with "B" style cluster with "C" style cluster

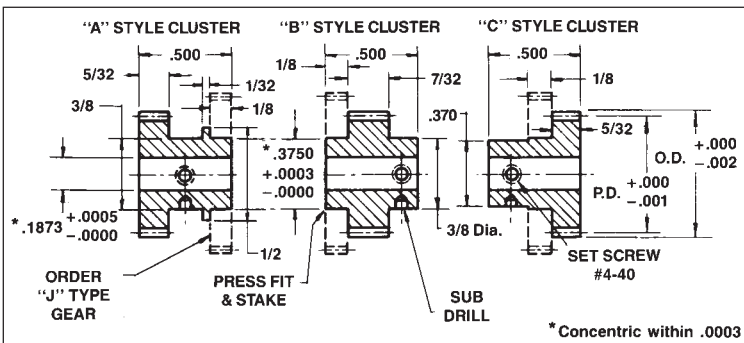
— Then repeat sequence for desired ratio

## RECOMMENDATIONS

- (1) Mesh stainless pinions with aluminum gears. Always reduce pitch and increase shaft size as ratio and torque increase.
- (2) Select "J" type gears as required for assembly to cluster gear hubs as to pitch, number of teeth and material. Always make a check layout to be sure gears do not run into adjacent hubs with correct center distances.
- (3) Center Distances — To select proper center distances see Technical Section of this Catalog.

# CLUSTER GEARS & HUBS — AGMA 10

20° Pressure Angle ■ 3/16" Bore



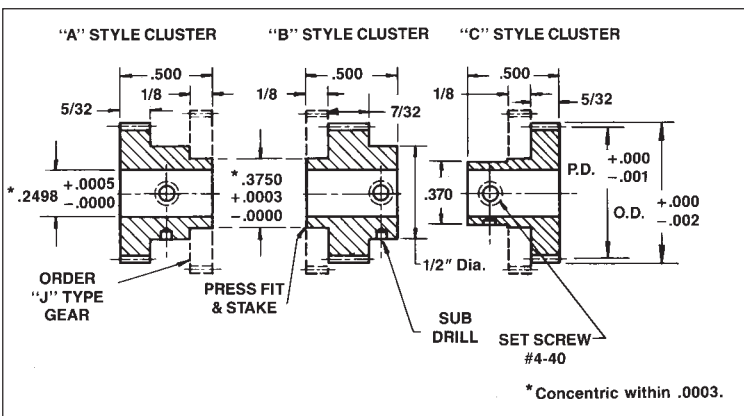
Material: 303 Stainless Steel

Pitch	No. Teeth	P.D.	O.D.	Part Number		
				"A" STYLE	"B" STYLE	"C" STYLE
48	20	.4166	.458	CO-1	CO-8	CO-15
	21	.4375	.479	CO-23	CO-80	CO-137
	22	.4583	.500	CO-24	CO-81	CO-138
	23	.4791	.521	CO-25	CO-82	CO-139
	24	.5000	.542	CO-26	CO-83	CO-140
64	25	.3906	.422	CO-2	CO-9	CO-16
	26	.4062	.438	CO-27	CO-84	CO-141
	27	.4218	.453	CO-28	CO-85	CO-142
	28	.4375	.469	CO-29	CO-86	CO-143
	29	.4531	.484	CO-30	CO-87	CO-144
	30	.4687	.500	CO-3	CO-10	CO-17
	31	.4843	.516	CO-31	CO-88	CO-145
	32	.5000	.531	CO-32	CO-89	CO-146
	33	.5156	.547	CO-33	CO-90	CO-147

For other pitches, bore sizes or modifications, consult factory.

# CLUSTER GEARS & HUBS — AGMA 10

20° Pressure Angle ■ 1/4" Bore



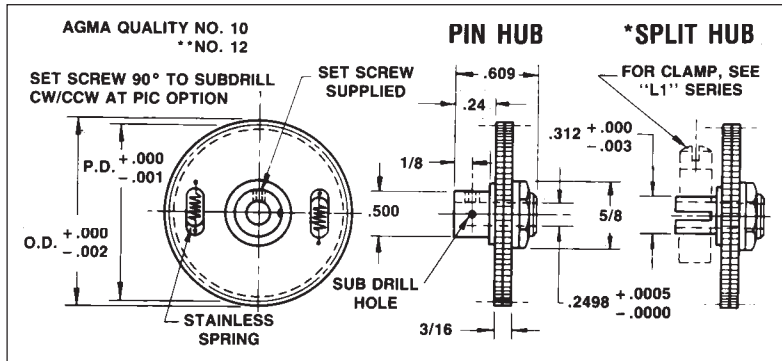
Material: 303 Stainless Steel

Pitch	No. Teeth	P.D.	O.D.	Part Number			
				"A" STYLE	"B" STYLE	"C" STYLE	
48	20	.4166	.458	CN-32	CN-95	CN-158	
	21	.4375	.479	CN-33	CN-96	CN-159	
	22	.4583	.500	CN-34	CN-97	CN-160	
	23	.4791	.521	CN-35	CN-98	CN-161	
	24	.5000	.542	CN-36	CN-99	CN-162	
	25	.5208	.563	CN-1	CN-8	CN-15	
	26	.5416	.583	CN-37	CN-100	CN-163	
	28	.5833	.625	CN-38	CN-101	CN-164	
	30	.6250	.667	CN-2	CN-9	CN-16	
	32	.6666	.708	CN-39	CN-102	CN-165	
	64	27	.4218	.453	CN-40	CN-103	CN-166
		28	.4375	.469	CN-41	CN-104	CN-167
30		.4687	.500	CN-42	CN-105	CN-168	
32		.5000	.531	CN-43	CN-106	CN-169	
34		.5312	.563	CN-44	CN-107	CN-170	
36		.5625	.594	CN-45	CN-108	CN-171	
38		.5937	.625	CN-46	CN-109	CN-172	
40		.6250	.656	CN-3	CN-10	CN-17	
42		.6562	.688	CN-47	CN-110	CN-173	
44		.6875	.719	CN-48	CN-111	CN-174	

For other pitches, bore sizes or modifications, consult factory.

# ANTI-BACKLASH GEAR-24 PITCH — 3/16" Face Width ■ 20° Pressure Angle

Interchangeable Design ■ Pin Hub — 1/4" Bores



Material:

- Gears — 303 Stainless Steel
- 2024-T4 Aluminum
- (Anodized Before Cutting)
- Hubs — 303 Stainless Steel

- \* For Split Hub Add -C to Part No.
- \*\* AGMA 12 Gears Add -Q12 to Part No.

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

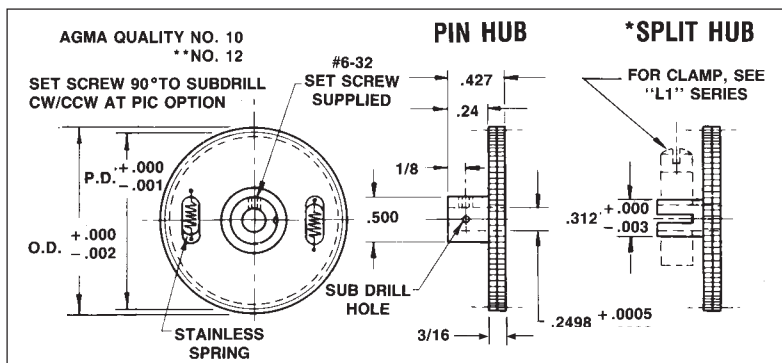
Gear Data			Stainless Steel Part No.	Aluminum Part No.
No. Teeth	P.D.	O.D.		
30	1.2500	1.333	P7-2-30	P4-2-30
35	1.4583	1.541	P7-2-35	P4-2-35
36	1.5000	1.583	P7-2-36	P4-2-36
40	1.6666	1.750	P7-2-40	P4-2-40
42	1.7500	1.833	P7-2-42	P4-2-42
45	1.8750	1.958	P7-2-45	P4-2-45
48	2.0000	2.083	P7-2-48	P4-2-48
50	2.0833	2.166	P7-2-50	P4-2-50
54	2.2500	2.333	P7-2-54	P4-2-54
55	2.2910	2.375	P7-2-55	P4-2-55
60	2.5000	2.583	P7-2-60	P4-2-60
65	2.7083	2.793	P7-2-65	P4-2-65
66	2.7500	2.833	P7-2-66	P4-2-66

Other Size Bores Available. Consult Factory.

Additional anti-backlash styles can be found on other pages in this section

# ANTI-BACKLASH GEAR-24 PITCH — 3/16" Face Width ■ 20° Pressure Angle

Compact Design ■ Pin Hub — 1/4" Bores



Material:

- Gears — 303 Stainless Steel
- 2024-T4 Aluminum
- (Anodized Before Cutting)
- Hubs — 303 Stainless Steel

- \* For Split Hub Add -C to Part No.
- \*\* AGMA 12 Gears Add -Q12 to Part No.

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

Gear Data			Stainless Steel Part No.	Aluminum Part No.
No. Teeth	P.D.	O.D.		
30	1.2500	1.333	P17-2-30	P14-2-30
35	1.4583	1.541	P17-2-35	P14-2-35
36	1.5000	1.583	P17-2-36	P14-2-36
40	1.6666	1.750	P17-2-40	P14-2-40
42	1.7500	1.833	P17-2-42	P14-2-42
45	1.8750	1.958	P17-2-45	P14-2-45
48	2.0000	2.083	P17-2-48	P14-2-48
50	2.0833	2.166	P17-2-50	P14-2-50
54	2.2500	2.333	P17-2-54	P14-2-54
55	2.2910	2.375	P17-2-55	P14-2-55
60	2.5000	2.583	P17-2-60	P14-2-60
65	2.7083	2.793	P17-2-65	P14-2-65
66	2.7500	2.833	P17-2-66	P14-2-66

Other Size Bores Available. Consult Factory.

Additional anti-backlash styles can be found on other pages in this section

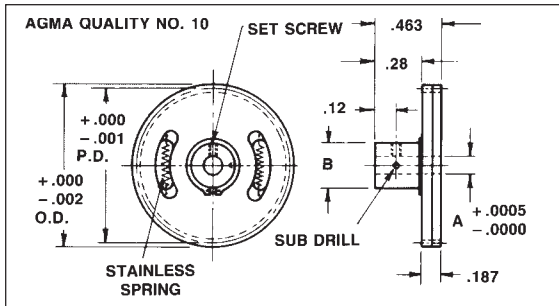
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# ANTI-BACKLASH GEAR-24 PITCH — 3/16" Face Width ■ 20° Pressure Angle

Miniature Design ■ Pin Hub — 3/16", 1/4" Bores



Dimen.	Bore	
	3/16	1/4
A	.1873	.2498
B	.375	.500
Set Screw	#4-40	#6-32

Gear Data			Stainless Steel Part No. Bore Size		Aluminum Part No. Bore Size	
No. Teeth	P.D.	O.D.	.1873	.2498	.1873	.2498
24	1.0000	1.083	P23-1-24	—	P24-1-24	—
25	1.0416	1.125	P23-1-25	—	P24-1-25	—
26	1.0833	1.166	P23-1-26	P25-1-26	P24-1-26	P26-1-26
28	1.1666	1.250	P23-1-28	P25-1-28	P24-1-28	P26-1-28

Additional anti-backlash styles can be found on other pages in this section

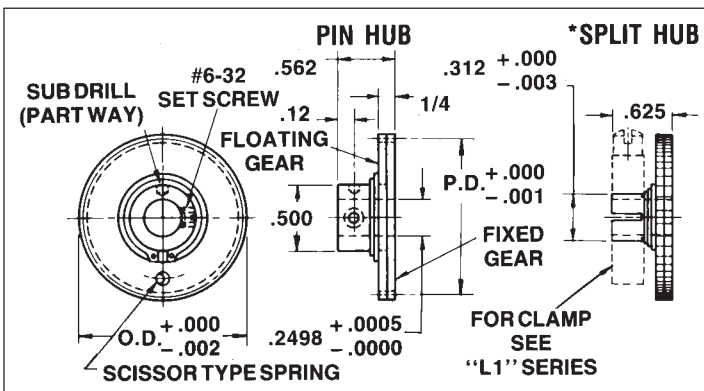
For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

Gears — 303 Stainless Steel  
2024-T4 Aluminum (Anodized Before Cutting)  
Hubs — 303 Stainless Steel

# ANTI-BACKLASH PINION-24 & 32 PITCH 20° Pressure Angle

Pin Hub — 1/4" Face Width ■ 1/4" Bore ■ AGMA Quality No. 10



Gear Data				Stainless Steel Part No.	Aluminum Part No.
Pitch	No. Teeth	P.D.	O.D.		
24	18	.7500	.833	P70-2-18	P40-2-18
	21	.8750	.958	P70-2-21	P40-2-21
	24	1.0000	1.083	P70-2-24	P40-2-24
32	24	.7500	.813	P70-4-24	P40-4-24
	28	.8750	.938	P70-4-28	P40-4-28
	32	1.0000	1.063	P70-4-32	P40-4-32

Other Size Bores Available, Consult Factory.

Additional anti-backlash styles can be found on other pages in this section

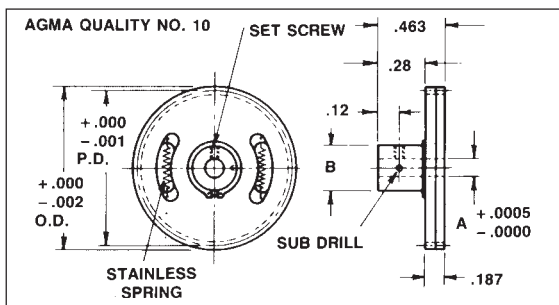
For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

Gears — 303 Stainless Steel  
2024-T4 Aluminum (Anodized Before Cutting)  
\*For split hub add -C to Part Number

# ANTI-BACKLASH GEAR-32 PITCH & 1/10th CIR. PITCH

20° Pressure Angle ■ Miniature Design ■ Pin Hub — 1/4" Bores, 3/16" Face Width



Dimen.	Bore	
	3/16	1/4
A	.1873	.2498
B	.375	.500
Set Screw	#4-40	#6-32

Pitch	Gear Data			Stainless Steel Part No. Bore Size		Aluminum Part No. Bore Size	
	No. Teeth	P.D.	O.D.	.1873	.2498	.1873	.2498
1/10 C.P.	32	1.0185	1.082	P23-2-32	—	P24-2-32	—
	34	1.0822	1.146	P23-2-34	P25-2-34	P24-2-34	P26-2-34
	35	1.1141	1.178	P23-2-35	P25-2-35	P24-2-35	P26-2-35
	36	1.1459	1.210	P23-2-36	P25-2-36	P24-2-36	P26-2-36
	38	1.2095	1.273	P23-2-38	P25-2-38	P24-2-38	P26-2-38
	40	1.2732	1.337	P23-2-40	P25-2-40	P24-2-40	P26-2-40
32	32	1.0000	1.062	P23-3-32	—	P24-3-32	—
	34	1.0625	1.125	P23-3-34	P25-3-34	P24-3-34	P26-3-34
	36	1.1250	1.187	P23-3-36	P25-3-36	P24-3-36	P26-3-36
	38	1.1875	1.250	P23-3-38	P25-3-38	P24-3-38	P26-3-38

Other Size Bores Available. Consult Factory.

Additional anti-backlash styles can be found on other pages in this section

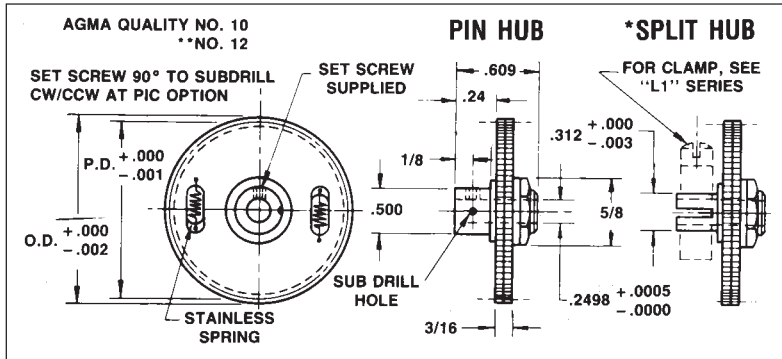
Gears — 303 Stainless Steel  
2024-T4 Aluminum (Anodized Before Cutting)  
Hubs — 303 Stainless Steel

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

# ANTI-BACKLASH GEAR-32 PITCH — 3/16" Face Width ■ 20° Pressure Angle

Interchangeable Design ■ Pin Hub — 1/4" Bores



Material:

Gears — 303 Stainless Steel  
2024-T4 Aluminum  
(Anodized Before Cutting)

Hubs — 303 Stainless Steel

\* For Split Hub Add -C to Part No.

\*\* AGMA 12 Gears Add -Q12 to Part No.

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

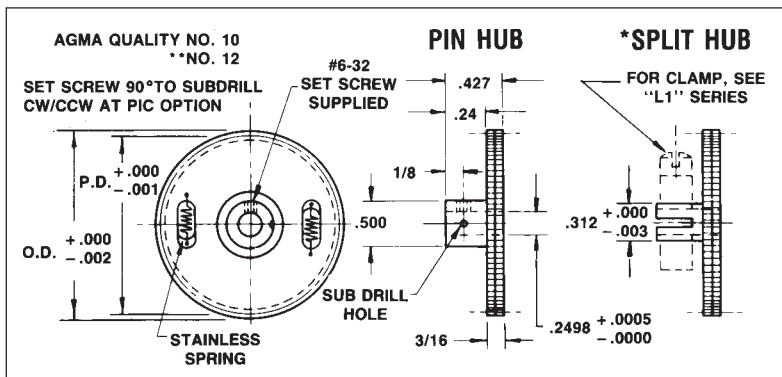
Gear Data			Stainless Steel Part No.	Aluminum Part No.
No. Teeth	P.D.	O.D.		
40	1.2500	1.312	P7-4-40	P4-4-40
45	1.4060	1.468	P7-4-45	P4-4-45
48	1.5000	1.562	P7-4-48	P4-4-48
50	1.5625	1.625	P7-4-50	P4-4-50
55	1.7187	1.781	P7-4-55	P4-4-55
56	1.7500	1.812	P7-4-56	P4-4-56
60	1.8750	1.937	P7-4-60	P4-4-60
64	2.0000	2.062	P7-4-64	P4-4-64
65	2.0325	2.093	P7-4-65	P4-4-65
70	2.1875	2.250	P7-4-70	P4-4-70
72	2.2500	2.312	P7-4-72	P4-4-72
75	2.3438	2.406	P7-4-75	P4-4-75
80	2.5000	2.562	P7-4-80	P4-4-80
85	2.6563	2.718	P7-4-85	P4-4-85

Other Size Bores Available. Consult Factory.

Additional anti-backlash styles can be found on other pages in this section

# ANTI-BACKLASH GEAR-32 PITCH — 3/16" Face Width ■ 20° Pressure Angle

Compact Design ■ Pin Hub — 1/4" Bores



Material:

Gears — 303 Stainless Steel  
2024-T4 Aluminum  
(Anodized Before Cutting)

Hubs — 303 Stainless Steel

\* For Split Hub Add -C to Part No.

\*\* AGMA 12 Gears Add -Q12 to Part No.

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

Gear Data			Stainless Steel Part No.	Aluminum Part No.
No. Teeth	P.D.	O.D.		
40	1.2500	1.312	P17-4-40	P14-4-40
45	1.4060	1.468	P17-4-45	P14-4-45
48	1.5000	1.562	P17-4-48	P14-4-48
50	1.5625	1.625	P17-4-50	P14-4-50
55	1.7187	1.781	P17-4-55	P14-4-55
56	1.7500	1.812	P17-4-56	P14-4-56
60	1.8750	1.937	P17-4-60	P14-4-60
64	2.0000	2.062	P17-4-64	P14-4-64
65	2.0325	2.093	P17-4-65	P14-4-65
70	2.1875	2.250	P17-4-70	P14-4-70
72	2.2500	2.312	P17-4-72	P14-4-72
75	2.3438	2.406	P17-4-75	P14-4-75
80	2.5000	2.562	P17-4-80	P14-4-80
85	2.6563	2.718	P17-4-85	P14-4-85

Other Size Bores Available, Consult Factory.

Additional anti-backlash styles can be found on other pages in this section

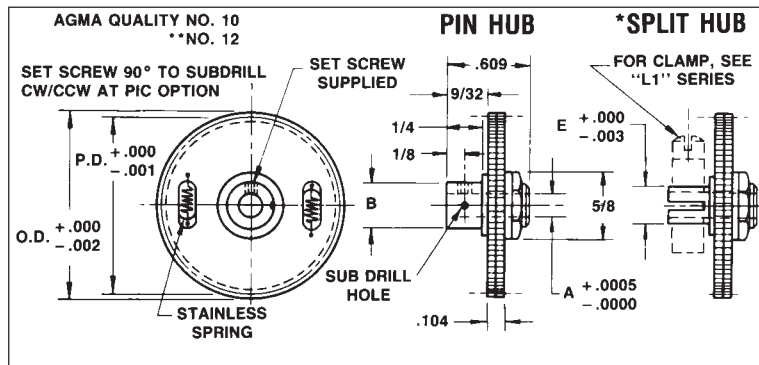
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# ANTI-BACKLASH GEAR-48 PITCH — .104" Face Width ■ 20° Pressure Angle

Interchangeable Design ■ Pin Hub — 1/8", 3/16", 1/4" Bores



Material:

Gears — 303 Stainless Steel  
2024-T4 Aluminum  
(Anodized Before Cutting)

Hubs — 303 Stainless Steel

\* For Split Hub Add -C to Part No.  
\*\* AGMA 12 Gears Add -Q12 to Part No.

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

Dimen.	Bore		
	1/8	3/16	1/4
A	.1248	.1873	.2498
B	.312	.375	.500
E	.188	.250	.312
Set Screw	#2-56	#4-40	#6-32

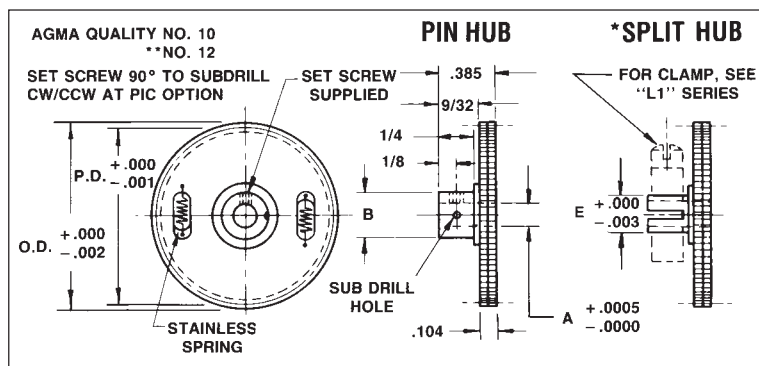
Gear Data			Stainless Steel Part No. Bore Size			Aluminum Part No. Bore Size		
No. Teeth	P.D.	O.D.	.1248	.1873	.2498	.1248	.1873	.2498
65	1.3541	1.396	P5-1-65	P6-1-65	P7-1-65	P2-1-65	P3-1-65	P4-1-65
70	1.4583	1.500	P5-1-70	P6-1-70	P7-1-70	P2-1-70	P3-1-70	P4-1-70
72	1.5000	1.542	P5-1-72	P6-1-72	P7-1-72	P2-1-72	P3-1-72	P4-1-72
75	1.5625	1.604	P5-1-75	P6-1-75	P7-1-75	P2-1-75	P3-1-75	P4-1-75
80	1.6667	1.708	P5-1-80	P6-1-80	P7-1-80	P2-1-80	P3-1-80	P4-1-80
84	1.7500	1.792	P5-1-84	P6-1-84	P7-1-84	P2-1-84	P3-1-84	P4-1-84
85	1.7708	1.812	P5-1-85	P6-1-85	P7-1-85	P2-1-85	P3-1-85	P4-1-85
90	1.8750	1.916	P5-1-90	P6-1-90	P7-1-90	P2-1-90	P3-1-90	P4-1-90
95	1.9791	2.021	P5-1-95	P6-1-95	P7-1-95	P2-1-95	P3-1-95	P4-1-95
96	2.0000	2.042	P5-1-96	P6-1-96	P7-1-96	P2-1-96	P3-1-96	P4-1-96
100	2.0833	2.125	P5-1-100	P6-1-100	P7-1-100	P2-1-100	P3-1-100	P4-1-100
105	2.1875	2.229	P5-1-105	P6-1-105	P7-1-105	P2-1-105	P3-1-105	P4-1-105
110	2.2916	2.333	P5-1-110	P6-1-110	P7-1-110	P2-1-110	P3-1-110	P4-1-110
115	2.3958	2.438	P5-1-115	P6-1-115	P7-1-115	P2-1-115	P3-1-115	P4-1-115
120	2.5000	2.541	P5-1-120	P6-1-120	P7-1-120	P2-1-120	P3-1-120	P4-1-120
125	2.6041	2.646	P5-1-125	P6-1-125	P7-1-125	P2-1-125	P3-1-125	P4-1-125
130	2.7083	2.750	P5-1-130	P6-1-130	P7-1-130	P2-1-130	P3-1-130	P4-1-130
132	2.7500	2.791	P5-1-132	P6-1-132	P7-1-132	P2-1-132	P3-1-132	P4-1-132

Other Size Bores Available, Consult Factory.

Additional anti-backlash styles can be found on other pages in this section

# ANTI-BACKLASH GEAR-48 PITCH — .104" Face Width ■ 20° Pressure Angle

Compact Design ■ Pin Hub — 1/8", 3/16", 1/4" Bores



Material:

Gears — 303 Stainless Steel  
2024-T4 Aluminum  
(Anodized Before Cutting)

Hubs — 303 Stainless Steel

\* For Split Hub Add -C to Part No.  
\*\* AGMA 12 Gears Add -Q12 to Part No.

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

Dimen.	Bore		
	1/8	3/16	1/4
A	.1248	.1873	.2498
B	.312	.375	.500
E	.188	.250	.312
Set Screw	#2-56	#4-40	#6-32

Gear Data			Stainless Steel Part No. Bore Size			Aluminum Part No. Bore Size		
No. Teeth	P.D.	O.D.	.1248	.1873	.2498	.1248	.1873	.2498
65	1.3541	1.396	P15-1-65	P16-1-65	P17-1-65	P12-1-65	P13-1-65	P14-1-65
70	1.4583	1.500	P15-1-70	P16-1-70	P17-1-70	P12-1-70	P13-1-70	P14-1-70
72	1.5000	1.542	P15-1-72	P16-1-72	P17-1-72	P12-1-72	P13-1-72	P14-1-72
75	1.5625	1.604	P15-1-75	P16-1-75	P17-1-75	P12-1-75	P13-1-75	P14-1-75
80	1.6667	1.708	P15-1-80	P16-1-80	P17-1-80	P12-1-80	P13-1-80	P14-1-80
84	1.7500	1.792	P15-1-84	P16-1-84	P17-1-84	P12-1-84	P13-1-84	P14-1-84
85	1.7708	1.812	P15-1-85	P16-1-85	P17-1-85	P12-1-85	P13-1-85	P14-1-85
90	1.8750	1.916	P15-1-90	P16-1-90	P17-1-90	P12-1-90	P13-1-90	P14-1-90
95	1.9791	2.021	P15-1-95	P16-1-95	P17-1-95	P12-1-95	P13-1-95	P14-1-95
96	2.0000	2.042	P15-1-96	P16-1-96	P17-1-96	P12-1-96	P13-1-96	P14-1-96
100	2.0833	2.125	P15-1-100	P16-1-100	P17-1-100	P12-1-100	P13-1-100	P14-1-100
105	2.1875	2.229	P15-1-105	P16-1-105	P17-1-105	P12-1-105	P13-1-105	P14-1-105
110	2.2916	2.333	P15-1-110	P16-1-110	P17-1-110	P12-1-110	P13-1-110	P14-1-110
115	2.3958	2.438	P15-1-115	P16-1-115	P17-1-115	P12-1-115	P13-1-115	P14-1-115
120	2.5000	2.541	P15-1-120	P16-1-120	P17-1-120	P12-1-120	P13-1-120	P14-1-120
125	2.6041	2.646	P15-1-125	P16-1-125	P17-1-125	P12-1-125	P13-1-125	P14-1-125
130	2.7083	2.750	P15-1-130	P16-1-130	P17-1-130	P12-1-130	P13-1-130	P14-1-130
132	2.7500	2.791	P15-1-132	P16-1-132	P17-1-132	P12-1-132	P13-1-132	P14-1-132

Other Size Bores Available, Consult Factory.

Additional anti-backlash styles can be found on other pages in this section

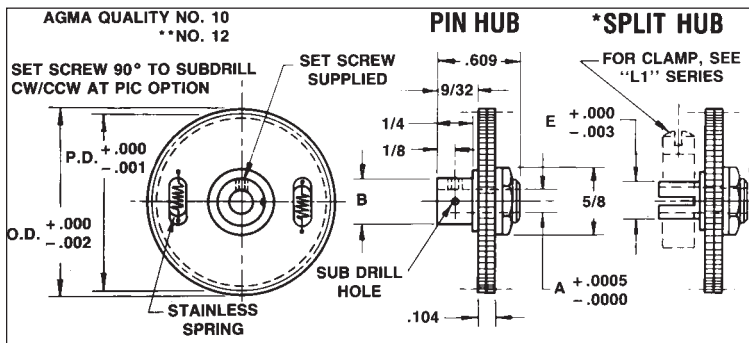
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# ANTI-BACKLASH GEAR-64 PITCH — .104" Face Width ■ 20° Pressure Angle

Interchangeable Design ■ Pin Hub — 1/8", 3/16", 1/4" Bores



Material:

- Gears — 303 Stainless Steel  
2024-T4 Aluminum  
(Anodized Before Cutting)
- Hubs — 303 Stainless Steel

\* For Split Hub Add -C to Part No.  
\*\* AGMA 12 Gears Add -Q12 to Part No.

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

Dimen.	Bore		
	1/8	3/16	1/4
A	.1248	.1873	.2498
B	.312	.375	.500
E	.188	.250	.312
Set Screw	#2-56	#4-40	#6-32

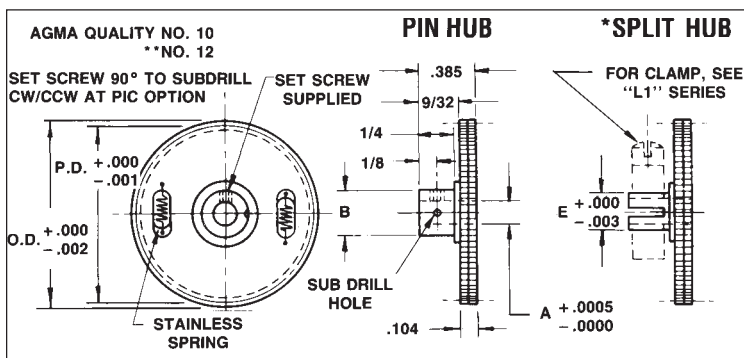
Gear Data			Stainless Steel Part No. Bore Size			Aluminum Part No. Bore Size		
No. Teeth	P.D.	O.D.	.1248	.1873	.2498	.1248	.1873	.2498
85	1.3281	1.359	P5-3-85	P6-3-85	P7-3-85	P2-3-85	P3-3-85	P4-3-85
90	1.4063	1.438	P5-3-90	P6-3-90	P7-3-90	P2-3-90	P3-3-90	P4-3-90
95	1.4844	1.516	P5-3-95	P6-3-95	P7-3-95	P2-3-95	P3-3-95	P4-3-95
96	1.5000	1.531	P5-3-96	P6-3-96	P7-3-96	P2-3-96	P3-3-96	P4-3-96
100	1.5625	1.594	P5-3-100	P6-3-100	P7-3-100	P2-3-100	P3-3-100	P4-3-100
105	1.6406	1.672	P5-3-105	P6-3-105	P7-3-105	P2-3-105	P3-3-105	P4-3-105
108	1.6875	1.718	P5-3-108	P6-3-108	P7-3-108	P2-3-108	P3-3-108	P4-3-108
110	1.7187	1.750	P5-3-110	P6-3-110	P7-3-110	P2-3-110	P3-3-110	P4-3-110
115	1.7969	1.828	P5-3-115	P6-3-115	P7-3-115	P2-3-115	P3-3-115	P4-3-115
120	1.8750	1.906	P5-3-120	P6-3-120	P7-3-120	P2-3-120	P3-3-120	P4-3-120
125	1.9531	1.984	P5-3-125	P6-3-125	P7-3-125	P2-3-125	P3-3-125	P4-3-125
128	2.0000	2.031	P5-3-128	P6-3-128	P7-3-128	P2-3-128	P3-3-128	P4-3-128
130	2.0312	2.063	P5-3-130	P6-3-130	P7-3-130	P2-3-130	P3-3-130	P4-3-130
140	2.1875	2.219	P5-3-140	P6-3-140	P7-3-140	P2-3-140	P3-3-140	P4-3-140
150	2.3438	2.375	P5-3-150	P6-3-150	P7-3-150	P2-3-150	P3-3-150	P4-3-150
160	2.5000	2.531	P5-3-160	P6-3-160	P7-3-160	P2-3-160	P3-3-160	P4-3-160
170	2.6563	2.688	P5-3-170	P6-3-170	P7-3-170	P2-3-170	P3-3-170	P4-3-170
176	2.7500	2.781	P5-3-176	P6-3-176	P7-3-176	P2-3-176	P3-3-176	P4-3-176

Other Size Bores Available, Consult Factory.

Additional anti-backlash styles can be found on other pages in this section

# ANTI-BACKLASH GEAR-64 PITCH — .104" Face Width ■ 20° Pressure Angle

Compact Design ■ Pin Hub — 1/8", 3/16", 1/4" Bores



Material:

- Gears — 303 Stainless Steel  
2024-T4 Aluminum  
(Anodized Before Cutting)
- Hubs — 303 Stainless Steel

\* For Split Hub Add -C to Part No.  
\*\* AGMA 12 Gears Add -Q12 to Part No.

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

Dimen.	Bore		
	1/8	3/16	1/4
A	.1248	.1873	.2498
B	.312	.375	.500
E	.188	.250	.312
Set Screw	#2-56	#4-40	#6-32

Gear Data			Stainless Steel Part No. Bore Size			Aluminum Part No. Bore Size		
No. Teeth	P.D.	O.D.	.1248	.1873	.2498	.1248	.1873	.2498
85	1.3281	1.359	P15-3-85	P16-3-85	P17-3-85	P12-3-85	P13-3-85	P14-3-85
90	1.4063	1.438	P15-3-90	P16-3-90	P17-3-90	P12-3-90	P13-3-90	P14-3-90
95	1.4844	1.516	P15-3-95	P16-3-95	P17-3-95	P12-3-95	P13-3-95	P14-3-95
96	1.5000	1.531	P15-3-96	P16-3-96	P17-3-96	P12-3-96	P13-3-96	P14-3-96
100	1.5625	1.594	P15-3-100	P16-3-100	P17-3-100	P12-3-100	P13-3-100	P14-3-100
105	1.6406	1.672	P15-3-105	P16-3-105	P17-3-105	P12-3-105	P13-3-105	P14-3-105
108	1.6875	1.718	P15-3-108	P16-3-108	P17-3-108	P12-3-108	P13-3-108	P14-3-108
110	1.7187	1.750	P15-3-110	P16-3-110	P17-3-110	P12-3-110	P13-3-110	P14-3-110
115	1.7969	1.828	P15-3-115	P16-3-115	P17-3-115	P12-3-115	P13-3-115	P14-3-115
120	1.8750	1.906	P15-3-120	P16-3-120	P17-3-120	P12-3-120	P13-3-120	P14-3-120
125	1.9531	1.984	P15-3-125	P16-3-125	P17-3-125	P12-3-125	P13-3-125	P14-3-125
128	2.0000	2.031	P15-3-128	P16-3-128	P17-3-128	P12-3-128	P13-3-128	P14-3-128
130	2.0312	2.063	P15-3-130	P16-3-130	P17-3-130	P12-3-130	P13-3-130	P14-3-130
140	2.1875	2.219	P15-3-140	P16-3-140	P17-3-140	P12-3-140	P13-3-140	P14-3-140
150	2.3438	2.375	P15-3-150	P16-3-150	P17-3-150	P12-3-150	P13-3-150	P14-3-150
160	2.5000	2.531	P15-3-160	P16-3-160	P17-3-160	P12-3-160	P13-3-160	P14-3-160
170	2.6563	2.688	P15-3-170	P16-3-170	P17-3-170	P12-3-170	P13-3-170	P14-3-170
176	2.7500	2.781	P15-3-176	P16-3-176	P17-3-176	P12-3-176	P13-3-176	P14-3-176

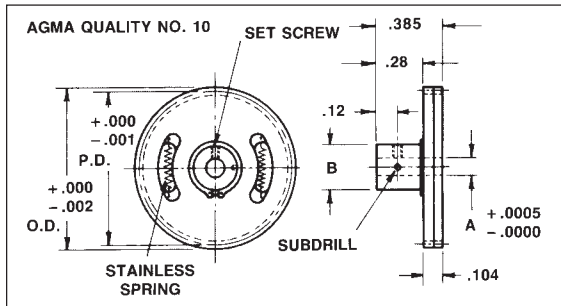
Other Size Bores Available, Consult Factory.

Additional anti-backlash styles can be found on other pages in this section

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# ANTI-BACKLASH GEAR-64 PITCH — .104" Face Width ■ 20° Pressure Angle

Miniature Design ■ Pin Hub — 1/8", 3/16", 1/4" Bores



Dimen.	Bore		
	1/8	3/16	1/4
A	.1248	.1873	.2498
B	.312	.375	.500
Set Screw	#2-56	#4-40	#6-32

Gear Data			Stainless Steel Part No. Bore Size			Aluminum Part No. Bore Size		
No. Teeth	P.D.	O.D.	.1248	.1873	.2498	.1248	.1873	.2498
52	0.8125	0.843	P21-5-52	—	—	P22-5-52	—	—
55	0.8594	0.890	P21-5-55	—	—	P22-5-55	—	—
56	0.8750	0.906	P21-5-56	—	—	P22-5-56	—	—
60	0.9375	0.968	P21-5-60	P23-5-60	P25-5-60	P22-5-60	P24-5-60	—
64	1.0000	1.031	P21-5-64	P23-5-64	P25-5-64	P22-5-64	P24-5-64	—
68	1.0625	1.093	P21-5-68	P23-5-68	P25-5-68	P22-5-68	P24-5-68	P26-5-58
70	1.0937	1.125	P21-5-70	P23-5-70	P25-5-70	P22-5-70	P24-5-70	P26-5-70
75	1.1719	1.203	P21-5-75	P23-5-75	P25-5-75	P22-5-75	P24-5-75	P26-5-75
80	1.2500	1.281	P21-5-80	P23-5-80	P25-5-80	P22-5-80	P24-5-80	P26-5-80

Other Size Bores Available. Consult Factory.

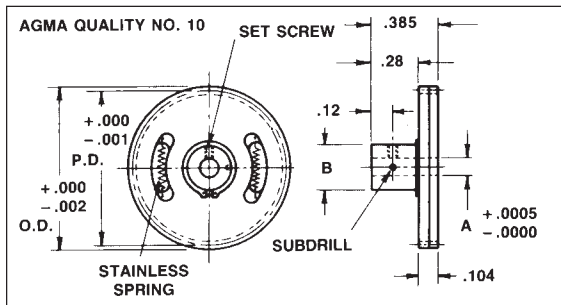
Additional anti-backlash styles can be found on other pages in this section

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

# ANTI-BACKLASH GEAR-72 PITCH — .104" Face Width ■ 20° Pressure Angle

Miniature Design ■ Pin Hub — 1/8", 3/16", 1/4" Bores



Dimen.	Bore		
	1/8	3/16	1/4
A	.1248	.1873	.2498
B	.312	.375	.500
Set Screw	#2-56	#4-40	#6-32

Additional anti-backlash styles can be found on other pages in this section

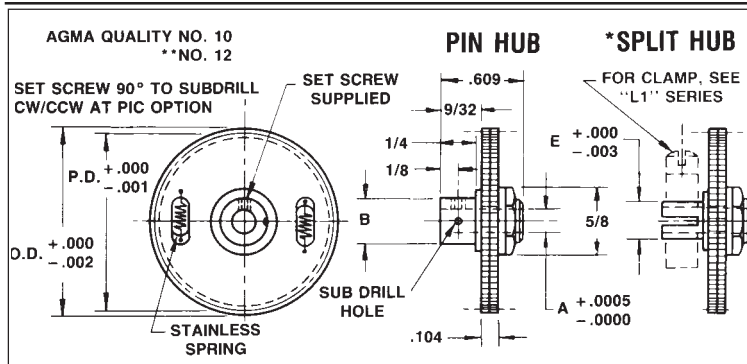
Gear Data			Stainless Steel Part No. Bore Size			Aluminum Part No. Bore Size		
No. Teeth	P.D.	O.D.	.1248	.1873	.2498	.1248	.1873	.2498
58	0.8056	0.833	P21-6-58	—	—	P22-6-58	—	—
60	0.8333	0.861	P21-6-60	—	—	P22-6-60	—	—
64	0.8889	0.916	P21-6-64	—	—	P22-6-64	—	—
68	0.9444	0.972	P21-6-68	P23-6-68	—	P22-6-68	P24-6-68	—
70	0.9720	1.000	P21-6-70	P23-6-70	—	P22-6-70	P24-6-70	—
72	1.0000	1.027	P21-6-72	P23-6-72	P25-6-72	P22-6-72	P24-6-72	P26-6-72
75	1.0417	1.069	P21-6-75	P23-6-75	P25-6-75	P22-6-75	P24-6-75	P26-6-75
80	1.1111	1.138	P21-6-80	P23-6-80	P25-6-80	P22-6-80	P24-6-80	P26-6-80
84	1.1667	1.194	P21-6-84	P23-6-84	P25-6-84	P22-6-84	P24-6-84	P26-6-84
90	1.2500	1.277	P21-6-90	P23-6-90	P25-6-90	P22-6-90	P24-6-90	P26-6-90
96	1.3333	1.361	P21-6-96	P23-6-96	P25-6-96	P22-6-96	P24-6-96	P26-6-96

Other Size Bores Available. Consult Factory.

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

Interchangeable Design ■ Pin Hub — 1/8", 3/16", 1/4" Bores — 72 Pitch



Dimen.	Bore		
	1/8	3/16	1/4
A	.1248	.1873	.2498
B	.312	.375	.500
E	.188	.250	.312
Set Screw	#2-56	#4-40	#6-32

Gear Data			Stainless Steel Part No. Bore Size			Aluminum Part No. Bore Size		
No. Teeth	P.D.	O.D.	.1248	.1873	.2498	.1248	.1873	.2498
100	1.3888	1.417	P5-5-100	P6-5-100	P7-5-100	P2-5-100	P3-5-100	P4-5-100
105	1.4583	1.486	P5-5-105	P6-5-105	P7-5-105	P2-5-105	P3-5-105	P4-5-105
108	1.5000	1.528	P5-5-108	P6-5-108	P7-5-108	P2-5-108	P3-5-108	P4-5-108
110	1.5277	1.556	P5-5-110	P6-5-110	P7-5-110	P2-5-110	P3-5-110	P4-5-110
115	1.5972	1.625	P5-5-115	P6-5-115	P7-5-115	P2-5-115	P3-5-115	P4-5-115
120	1.6666	1.695	P5-5-120	P6-5-120	P7-5-120	P2-5-120	P3-5-120	P4-5-120
125	1.7360	1.764	P5-5-125	P6-5-125	P7-5-125	P2-5-125	P3-5-125	P4-5-125
130	1.8055	1.833	P5-5-130	P6-5-130	P7-5-130	P2-5-130	P3-5-130	P4-5-130
140	1.9444	1.972	P5-5-140	P6-5-140	P7-5-140	P2-5-140	P3-5-140	P4-5-140
144	2.0000	2.028	P5-5-144	P6-5-144	P7-5-144	P2-5-144	P3-5-144	P4-5-144
150	2.0833	2.111	P5-5-150	P6-5-150	P7-5-150	P2-5-150	P3-5-150	P4-5-150
160	2.2222	2.250	P5-5-160	P6-5-160	P7-5-160	P2-5-160	P3-5-160	P4-5-160
170	2.3611	2.389	P5-5-170	P6-5-170	P7-5-170	P2-5-170	P3-5-170	P4-5-170
180	2.5000	2.528	P5-5-180	P6-5-180	P7-5-180	P2-5-180	P3-5-180	P4-5-180
190	2.6388	2.667	P5-5-190	P6-5-190	P7-5-190	P2-5-190	P3-5-190	P4-5-190
200	2.7776	2.806	P5-5-200	P6-5-200	P7-5-200	P2-5-200	P3-5-200	P4-5-200

Other Size Bores Available. Consult Factory. Additional anti-backlash styles can be found on other pages in this section

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

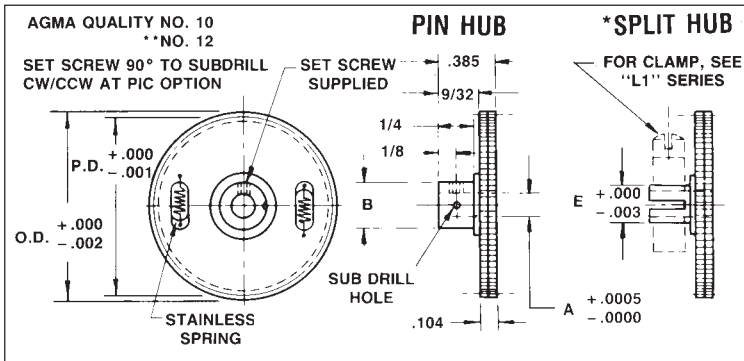
Material:  
Gears — 303 Stainless Steel, 2024-T4 Aluminum (Anodized Before Cutting)  
Hubs — 303 Stainless Steel

\* For Split Hub Add -C to Part No.  
\*\* AGMA 12 Gears Add -Q12 to Part No.



# ANTI-BACKLASH GEAR-72 PITCH — .104" Face Width ■ 20° Pressure Angle

Compact Design ■ Pin Hub — 1/8", 3/16", 1/4" Bores



Gear Data			Stainless Steel Part No. Bore Size			Aluminum Part No. Bore Size		
No. Teeth	P.D.	O.D.	.1248	.1873	.2498	.1248	.1873	.2498
100	1.3888	1.417	P15-5-100	P16-5-100	P17-5-100	P12-5-100	P13-5-100	P14-5-100
105	1.4583	1.486	P15-5-105	P16-5-105	P17-5-105	P12-5-105	P13-5-105	P14-5-105
108	1.5000	1.528	P15-5-108	P16-5-108	P17-5-108	P12-5-108	P13-5-108	P14-5-108
110	1.5277	1.556	P15-5-110	P16-5-110	P17-5-110	P12-5-110	P13-5-110	P14-5-110
115	1.5972	1.625	P15-5-115	P16-5-115	P17-5-115	P12-5-115	P13-5-115	P14-5-115
120	1.6666	1.695	P15-5-120	P16-5-120	P17-5-120	P12-5-120	P13-5-120	P14-5-120
125	1.7360	1.764	P15-5-125	P16-5-125	P17-5-125	P12-5-125	P13-5-125	P14-5-125
130	1.8055	1.833	P15-5-130	P16-5-130	P17-5-130	P12-5-130	P13-5-130	P14-5-130
140	1.9444	1.972	P15-5-140	P16-5-140	P17-5-140	P12-5-140	P13-5-140	P14-5-140
144	2.0000	2.028	P15-5-144	P16-5-144	P17-5-144	P12-5-144	P13-5-144	P14-5-144
150	2.0833	2.111	P15-5-150	P16-5-150	P17-5-150	P12-5-150	P13-5-150	P14-5-150
160	2.2222	2.250	P15-5-160	P16-5-160	P17-5-160	P12-5-160	P13-5-160	P14-5-160
170	2.3611	2.389	P15-5-170	P16-5-170	P17-5-170	P12-5-170	P13-5-170	P14-5-170
180	2.5000	2.528	P15-5-180	P16-5-180	P17-5-180	P12-5-180	P13-5-180	P14-5-180
190	2.6388	2.667	P15-5-190	P16-5-190	P17-5-190	P12-5-190	P13-5-190	P14-5-190
200	2.7776	2.806	P15-5-200	P16-5-200	P17-5-200	P12-5-200	P13-5-200	P14-5-200

Other Size Bores Available, Consult Factory.

Additional anti-backlash styles can be found on other pages in this section

Gears — 303 Stainless Steel  
2024-T4 Aluminum  
(Anodized Before Cutting)  
Hubs — 303 Stainless Steel

Dimen.	Bore		
	1/8	3/16	1/4
A	.1248	.1873	.2498
B	.312	.375	.500
E	.188	.250	.312
Set Screw	#2-56	#4-40	#6-32

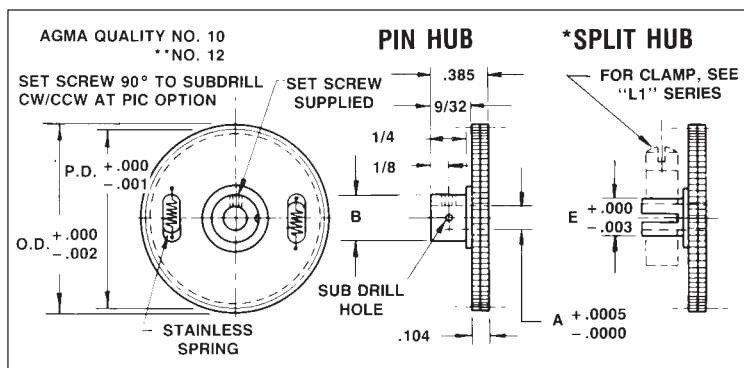
\* For Split Hub Add -C to Part No.  
\*\* AGMA 12 Gears Add -Q12 to Part No.

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

# ANTI-BACKLASH GEAR-80 PITCH — .104" Face Width ■ 20° Pressure Angle

Compact Design ■ Pin Hub — 1/8", 3/16", 1/4" Bores



Gear Data			Stainless Steel Part No. Bore Size			Aluminum Part No. Bore Size		
No. Teeth	P.D.	O.D.	.1248	.1873	.2498	.1248	.1873	.2498
100	1.2500	1.275	P15-6-100	P16-6-100	P17-6-100	P12-6-100	P13-6-100	P14-6-100
105	1.3125	1.337	P15-6-105	P16-6-105	P17-6-105	P12-6-105	P13-6-105	P14-6-105
110	1.3750	1.400	P15-6-110	P16-6-110	P17-6-110	P12-6-110	P13-6-110	P14-6-110
115	1.4375	1.462	P15-6-115	P16-6-115	P17-6-115	P12-6-115	P13-6-115	P14-6-115
120	1.5000	1.525	P15-6-120	P16-6-120	P17-6-120	P12-6-120	P13-6-120	P14-6-120
125	1.5625	1.587	P15-6-125	P16-6-125	P17-6-125	P12-6-125	P13-6-125	P14-6-125
130	1.6250	1.650	P15-6-130	P16-6-130	P17-6-130	P12-6-130	P13-6-130	P14-6-130
135	1.6875	1.712	P15-6-135	P16-6-135	P17-6-135	P12-6-135	P13-6-135	P14-6-135
140	1.7500	1.775	P15-6-140	P16-6-140	P17-6-140	P12-6-140	P13-6-140	P14-6-140
145	1.8125	1.837	P15-6-145	P16-6-145	P17-6-145	P12-6-145	P13-6-145	P14-6-145
150	1.8750	1.900	P15-6-150	P16-6-150	P17-6-150	P12-6-150	P13-6-150	P14-6-150
160	2.0000	2.025	P15-6-160	P16-6-160	P17-6-160	P12-6-160	P13-6-160	P14-6-160
170	2.1250	2.150	P15-6-170	P16-6-170	P17-6-170	P12-6-170	P13-6-170	P14-6-170
180	2.2500	2.275	P15-6-180	P16-6-180	P17-6-180	P12-6-180	P13-6-180	P14-6-180
190	2.3750	2.400	P15-6-190	P16-6-190	P17-6-190	P12-6-190	P13-6-190	P14-6-190
200	2.5000	2.525	P15-6-200	P16-6-200	P17-6-200	P12-6-200	P13-6-200	P14-6-200
220	2.7500	2.775	P15-6-220	P16-6-220	P17-6-220	P12-6-220	P13-6-220	P14-6-220

Other Size Bores Available, Consult Factory.

Material:  
Gears — 303 Stainless Steel  
2024-T4 Aluminum (Black Anodize)  
Hubs — 303 Stainless Steel

Dimen.	Bore		
	1/8	3/16	1/4
A	.1248	.1873	.2498
B	.312	.375	.500
E	.188	.250	.312
Set Screw	#2-56	#4-40	#6-32

\* For Split Hub Add -C to Part No.  
\*\* AGMA 12 Gears add -Q12 to Part No.

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

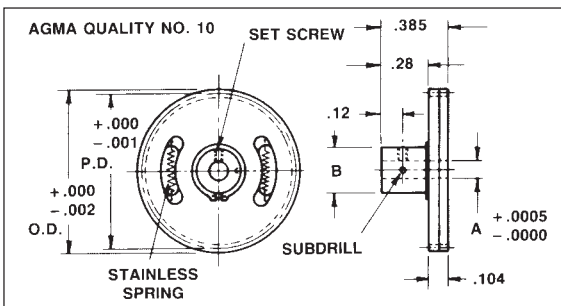
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# ANTI-BACKLASH GEAR-96 PITCH — .104" Face Width ■ 20° Pressure Angle

Miniature Design ■ Pin Hub — 1/8", 3/16", 1/4" Bores



Dimen.	Bore		
	1/8	3/16	1/4
A	.1248	.1873	.2498
B	.312	.375	.500
Set Screw	#2-56	#4-40	#6-32

Additional anti-backlash styles can be found on other pages in this section

Gear Data			Stainless Steel Part No. Bore Size			Aluminum Part No. Bore Size		
No. Teeth	P.D.	O.D.	.1248	.1873	.2498	.1248	.1873	.2498
76	0.7917	0.812	P21-8-76	—	—	P22-8-76	—	—
80	0.8333	0.854	P21-8-80	—	—	P22-8-80	—	—
84	0.8750	0.895	P21-8-84	—	—	P22-8-84	—	—
90	0.9375	0.958	P21-8-90	P23-8-90	—	P22-8-90	P24-8-90	—
96	1.0000	1.020	P21-8-96	P23-8-96	P25-8-96	P22-8-96	P24-8-96	P26-8-96
100	1.0417	1.062	P21-8-100	P23-8-100	P25-8-100	P22-8-100	P24-8-100	P26-8-100
108	1.1250	1.145	P21-8-108	P23-8-108	P25-8-108	P22-8-108	P24-8-108	P26-8-108
112	1.1667	1.187	P21-8-112	P23-8-112	P25-8-112	P22-8-112	P24-8-112	P26-8-112
120	1.250	1.270	P21-8-120	P23-8-120	P25-8-120	P22-8-120	P24-8-120	P26-8-120
125	1.3021	1.322	P21-8-125	P23-8-125	P25-8-125	P22-8-125	P24-8-125	P26-8-125

Other Size Bores Available. Consult Factory.

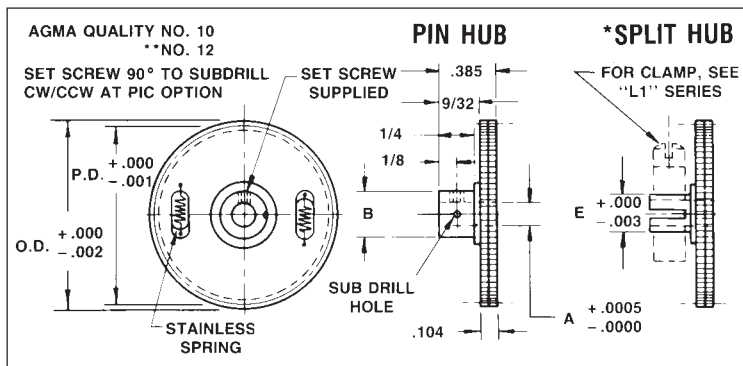
Material:

- Gears — 303 Stainless Steel  
2024-T4 Aluminum (Anodized Before Cutting)
- Hubs — 303 Stainless Steel

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number. Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

# ANTI-BACKLASH GEAR-96 PITCH — .104" Face Width ■ 20° Pressure Angle

Compact Design ■ Pin Hub — 1/8", 3/16", 1/4" Bores



Dimen.	Bore		
	1/8	3/16	1/4
A	.1248	.1873	.2498
B	.312	.375	.500
E	.188	.250	.312
Set Screw	#2-56	#4-40	#6-32

Material:

- Gears — 303 Stainless Steel  
2024-T4 Aluminum (Black Anodize)
- Hubs — 303 Stainless Steel

Gear Data			Stainless Steel Part No. Bore Size			Aluminum Part No. Bore Size		
No. Teeth	P.D.	O.D.	.1248	.1873	.2498	.1248	.1873	.2498
130	1.3541	1.375	P15-7-130	P16-7-130	P17-7-130	P12-7-130	P13-7-130	P14-7-130
135	1.4061	1.427	P15-7-135	P16-7-135	P17-7-135	P12-7-135	P13-7-135	P14-7-135
140	1.4583	1.479	P15-7-140	P16-7-140	P17-7-140	P12-7-140	P13-7-140	P14-7-140
144	1.5000	1.521	P15-7-144	P16-7-144	P17-7-144	P12-7-144	P13-7-144	P14-7-144
145	1.5104	1.531	P15-7-145	P16-7-145	P17-7-145	P12-7-145	P13-7-145	P14-7-145
150	1.5624	1.583	P15-7-150	P16-7-150	P17-7-150	P12-7-150	P13-7-150	P14-7-150
160	1.6666	1.687	P15-7-160	P16-7-160	P17-7-160	P12-7-160	P13-7-160	P14-7-160
170	1.7707	1.792	P15-7-170	P16-7-170	P17-7-170	P12-7-170	P13-7-170	P14-7-170
180	1.8750	1.896	P15-7-180	P16-7-180	P17-7-180	P12-7-180	P13-7-180	P14-7-180
190	1.9791	2.000	P15-7-190	P16-7-190	P17-7-190	P12-7-190	P13-7-190	P14-7-190
192	2.0000	2.021	P15-7-192	P16-7-192	P17-7-192	P12-7-192	P13-7-192	P14-7-192
200	2.0833	2.104	P15-7-200	P16-7-200	P17-7-200	P12-7-200	P13-7-200	P14-7-200
210	2.1874	2.208	P15-7-210	P16-7-210	P17-7-210	P12-7-210	P13-7-210	P14-7-210
220	2.2916	2.312	P15-7-220	P16-7-220	P17-7-220	P12-7-220	P13-7-220	P14-7-220
230	2.3958	2.416	P15-7-230	P16-7-230	P17-7-230	P12-7-230	P13-7-230	P14-7-230
240	2.5000	2.521	P15-7-240	P16-7-240	P17-7-240	P12-7-240	P13-7-240	P14-7-240
250	2.6040	2.625	P15-7-250	P16-7-250	P17-7-250	P12-7-250	P13-7-250	P14-7-250
260	2.7082	2.729	P15-7-260	P16-7-260	P17-7-260	P12-7-260	P13-7-260	P14-7-260
264	2.7500	2.771	P15-7-264	P16-7-264	P17-7-264	P12-7-264	P13-7-264	P14-7-264

Other Size Bores Available. Consult Factory.

Additional anti-backlash styles can be found on other pages in this section

\* For Split Hub Add -C to Part No.

\*\* AGMA 12 Gears add - Q12 to Part No.

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number. Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

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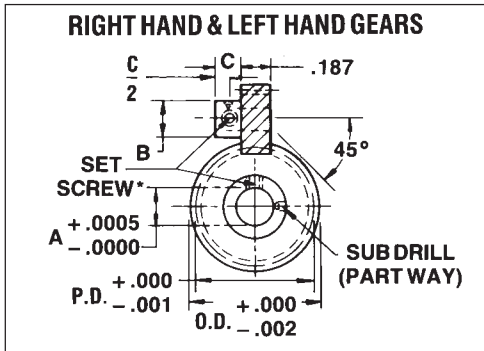
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# HELICAL GEAR-48 NORMAL PITCH $\frac{3}{16}$ " Face Width ■ 20° Pressure Angle

45° Helical Angle ■ Pin Hub —  $\frac{3}{16}$ ",  $\frac{1}{4}$ " Bores ■ AGMA Quality No. 10



Material: 303 Stainless Steel  
2024-T4 Aluminum (Anodized Before Cutting)

\* Set Screw 90° To Subdrill  
CW/CCW At PIC Option

Note:  
For right angle drives use same handed gears.  
Thrust bearings may be required.  
See technical section 13-4

Dimen.	Bore	
	3/16	1/4
<b>A</b>	.1873	.2498
<b>B</b>	.375	.500
<b>C</b>	.219	.250
<b>Set Screw</b>	#4-40	#6-32

Gear Data				3/16" Bore		1/4" Bore	
No. Teeth	P.D.	O.D.	Material	Part No. Right Hand	Part No. Left Hand	Part No. Right Hand	Part No. Left Hand
20	.5892	.631	Stainless Aluminum	AC3-20 AC4-20	AD3-20 AD4-20	AC1-20 AC2-20	AD1-20 AD2-20
25	.7365	.778	Stainless Aluminum	AC3-25 AC4-25	AD3-25 AD4-25	AC1-25 AC2-25	AD1-25 AD2-25
30	.8838	.925	Stainless Aluminum	AC3-30 AC4-30	AD3-30 AD4-30	AC1-30 AC2-30	AD1-30 AD2-30
35	1.0311	1.072	Stainless Aluminum	AC3-35 AC4-35	AD3-35 AD4-35	AC1-35 AC2-35	AD1-35 AD2-35
40	1.1784	1.220	Stainless Aluminum	AC3-40 AC4-40	AD3-40 AD4-40	AC1-40 AC2-40	AD1-40 AD2-40
45	1.3258	1.367	Stainless Aluminum	AC3-45 AC4-45	AD3-45 AD4-45	AC1-45 AC2-45	AD1-45 AD2-45
50	1.4730	1.514	Stainless Aluminum	AC3-50 AC4-50	AD3-50 AD4-50	AC1-50 AC2-50	AD1-50 AD2-50
60	1.7676	1.809	Stainless Aluminum	AC3-60 AC4-60	AD3-60 AD4-60	AC1-60 AC2-60	AD1-60 AD2-60
70	2.0622	2.104	Stainless Aluminum	AC3-70 AC4-70	AD3-70 AD4-70	AC1-70 AC2-70	AD1-70 AD2-70

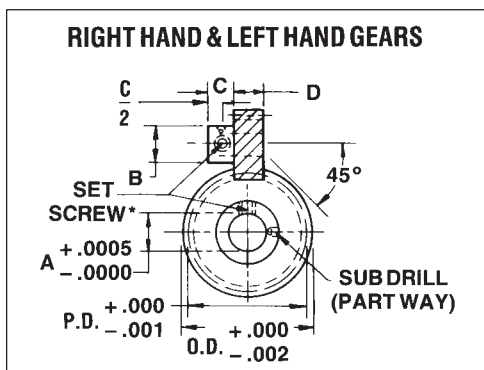
Other Size Bores Available, Consult Factory.

FOR SPECIAL HELICAL GEARS, ORDER AS FOLLOWS:

For Unlisted Number of Teeth, Specify the Number of Teeth desired as the last figure in the part number.  
EXAMPLE: For a 55 Tooth Gear, Specify Part Number AD1-55.

# HELICAL GEAR-64 NORMAL PITCH $\frac{1}{8}$ ", $\frac{3}{16}$ " Face Width ■ 20° Pressure Angle

45° Helical Angle ■ Pin Hub —  $\frac{1}{8}$ ",  $\frac{3}{16}$ " Bores ■ AGMA Quality No. 10



Material: 303 Stainless Steel  
2024-T4 Aluminum (Anodized Before Cutting)

\* Set Screw 90° To Subdrill  
CW/CCW At PIC Option

Dimen.	Bore	
	1/8	3/16
<b>A</b>	.1248	.1873
<b>B</b>	.312	.375
<b>C</b>	.187	.219
<b>D</b>	.125	.187
<b>Set Screw</b>	#2-56	#4-40

Gear Data				1/8" Bore		3/16" Bore	
No. Teeth	+ .000 - .001 P.D.	+ .000 - .002 O.D.	Material	Part No. Right Hand	Part No. Left Hand	Part No. Right Hand	Part No. Left Hand
20	.4419	.473	Stainless Aluminum	AC7-20 AC8-20	AD7-20 AD8-20	AC5-20 AC6-20	AD5-20 AD6-20
25	.5524	.583	Stainless Aluminum	AC7-25 AC8-25	AD7-25 AD8-25	AC5-25 AC6-25	AD5-25 AD6-25
30	.6629	.694	Stainless Aluminum	AC7-30 AC8-30	AD7-30 AD8-30	AC5-30 AC6-30	AD5-30 AD6-30
35	.7733	.804	Stainless Aluminum	AC7-35 AC8-35	AD7-35 AD8-35	AC5-35 AC6-35	AD5-35 AD6-35
40	.8838	.915	Stainless Aluminum	AC7-40 AC8-40	AD7-40 AD8-40	AC5-40 AC6-40	AD5-40 AD6-40
45	.9943	1.025	Stainless Aluminum	AC7-45 AC8-45	AD7-45 AD8-45	AC5-45 AC6-45	AD5-45 AD6-45
50	1.1048	1.136	Stainless Aluminum	AC7-50 AC8-50	AD7-50 AD8-50	AC5-50 AC6-50	AD5-50 AD6-50
60	1.3257	1.357	Stainless Aluminum	AC7-60 AC8-60	AD7-60 AD8-60	AC5-60 AC6-60	AD5-60 AD6-60
70	1.5466	1.577	Stainless Aluminum	AC7-70 AC8-70	AD7-70 AD8-70	AC5-70 AC6-70	AD5-70 AD6-70

Other Size Bores Available, Consult Factory.

FOR SPECIAL HELICAL GEARS, ORDER AS FOLLOWS:

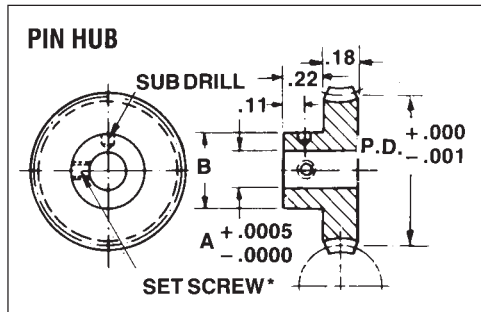
For Unlisted Number of Teeth, Specify the Number of Teeth desired as the last figure in the part number.  
EXAMPLE: For a 55 Tooth Gear, Specify Part Number AD6-55.

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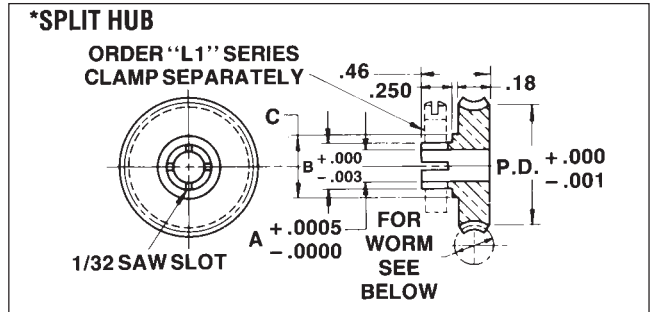
# WORM WHEEL - 48 PITCH — 14½°, 20°, 25° Pressure Angle

Right Hand ■ Single, Double & Four Thread ■ Pin Hub, Split Hub — 1/8", 3/16" & 1/4" Bores ■ AGMA Quality No. 10



Material: Bronze ASTM B21  
Alloy 464

Ratio =  $\frac{\text{No. Teeth}}{\text{No. Threads}}$



\* Set Screw 90° To Subdrill  
CW/CCW At PIC Option

PIN HUB

Gear Data					Single Thread (14½° P.A.)	Double Thread (20° P.A.)	Four Thread (25° P.A.)
No. Teeth	Pitch Dia.	A	B	Set Screw	Part No.	Part No.	Part No.
30	.6250				Q7-14	Q9-14	Q11-14
40	.8333				Q7-15	Q9-15	Q11-15
50	1.0417				Q7-1	Q9-1	Q11-1
60	1.2500				Q7-2	Q9-2	Q11-2
70	1.4583	.1248 (1/8)	.312	#2-56	Q7-16	Q9-16	Q11-16
80	1.6667				Q7-3	Q9-3	Q11-3
90	1.8750				Q7-4	Q9-4	Q11-4
100	2.0833				Q7-17	Q9-17	Q11-17
120	2.5000				Q7-18	Q9-18	Q11-18
30	.6250				Q7-19	Q9-19	Q11-19
40	.8333				Q7-20	Q9-20	Q11-20
50	1.0417				Q7-5	Q9-5	Q11-5
60	1.2500				Q7-6	Q9-6	Q11-6
70	1.4583	.1873 (3/16)	.375	#4-40	Q7-21	Q9-21	Q11-21
80	1.6667				Q7-7	Q9-7	Q11-7
90	1.8750				Q7-8	Q9-8	Q11-8
100	2.0833				Q7-22	Q9-22	Q11-22
120	2.5000				Q7-23	Q9-23	Q11-23
30	.6250				Q7-24	Q9-24	Q11-24
40	.8333				Q7-25	Q9-25	Q11-25
50	1.0417				Q7-9	Q9-9	Q11-9
60	1.2500				Q7-10	Q9-10	Q11-10
70	1.4583				Q7-26	Q9-26	Q11-26
80	1.6667	.2498 (1/4)	.500	#6-32	Q7-11	Q9-11	Q11-11
90	1.8750				Q7-12	Q9-12	Q11-12
100	2.0833				Q7-27	Q9-27	Q11-27
120	2.5000				Q7-28	Q9-28	Q11-28
180	3.7500				Q7-13	Q9-13	Q11-13

Other Numbers of Teeth and Material Available on Request, Consult Factory.

SPLIT HUB

Gear Data						Single Thread (14½° P.A.)	Double Thread (20° P.A.)	Four Thread (25° P.A.)
No. Teeth	Pitch Dia.	A	B	C	Clamp No. (Ref.)	Part No.	Part No.	Part No.
50	1.042					Q7-1-C	Q9-1-C	Q11-1-C
60	1.250	.1248 (1/8)	.188	1/4	L1-4	Q7-2-C	Q9-2-C	Q11-2-C
80	1.667					Q7-3-C	Q9-3-C	Q11-3-C
90	1.875					Q7-4-C	Q9-4-C	Q11-4-C
50	1.042					Q7-5-C	Q9-5-C	Q11-5-C
60	1.250	.1873 (3/16)	.250	5/16	L1-5	Q7-6-C	Q9-6-C	Q11-6-C
80	1.667					Q7-7-C	Q9-7-C	Q11-7-C
90	1.875					Q7-8-C	Q9-8-C	Q11-8-C
50	1.042					Q7-9-C	Q9-9-C	Q11-9-C
60	1.250	.2498 (1/4)	.312	3/8	L1-6	Q7-10-C	Q9-10-C	Q11-10-C
80	1.667					Q7-11-C	Q9-11-C	Q11-11-C
90	1.875					Q7-12-C	Q9-12-C	Q11-12-C
180	3.750					Q7-13-C	Q9-13-C	Q11-13-C

Other Numbers of Teeth and Material Available on Request, Consult Factory.

Single Thread (Q7 Series) Meshes With Q8 Worm Only  
Double Thread (Q9 Series) Meshes With Q10 Worm Only  
Four Thread (Q11 Series) Meshes With Q12 Worm Only

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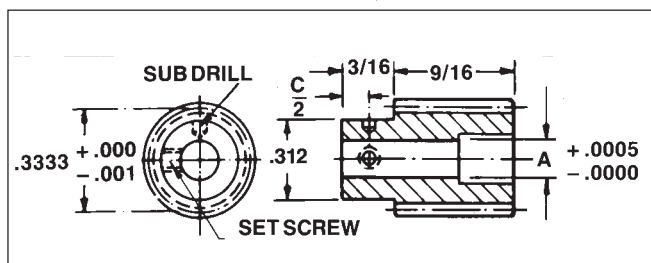
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# WORM - 48 PITCH — 14½°, 20°, 25° Pressure Angle

Right Hand ■ Single, Double & Four Thread ■ Pin Hub — 1/8" & 3/16" Bores



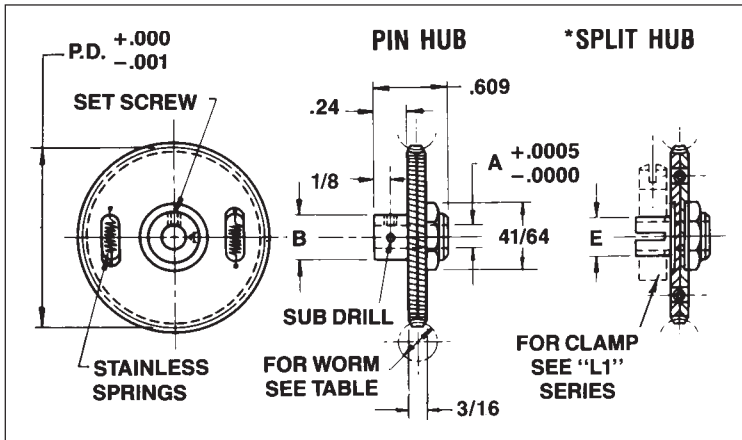
Shaft Size	A	Set Screw	Use With Single Thread (14½° P.A.)	Use With Double Thread (20° P.A.)	Use With Four Thread (25° P.A.)
			Part No.	Part No.	Part No.
1/8	.1248	#2-56	Q8-1	Q10-1	Q12-1
3/16	.1873	#4-40	Q8-2	Q10-2	Q12-2

Material: 303 Stainless Steel

Part No.	Lead	Lead Angle
Q8	.0654	3° 35'
Q10	.1309	7° 7'
Q12	.2618	14° 2'

# ANTI-BACKLASH WORM WHEEL - 48 PITCH

Single, Double & Four Thread ■ Pin Hub — 1/8", 3/16" & 1/4" Bore ■ AGMA Quality No. 10



Material:

Gears — Bronze QQB 639 Alloy 464

Hubs — 303 Stainless Steel

\*For Split Hub Add -C to Part No.

Dimen.	Bore		
	1/8	3/16	1/4
A	.1248	.1873	.2498
B	.31	.37	.500
E	.188	.250	.312
Set Screw	#2-56	#4-40	#6-32

Matched Pairs  
Right Hand

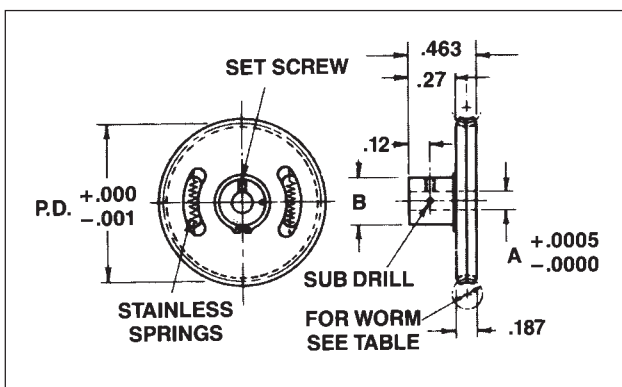
Gear Data				Part Number Bore Size		
No. Teeth	Pitch Dia.	Thread	Use With Worm #	.1248	.1873	.2498
70	1.4583	Single	Q8	Q14-1	Q14-7	Q14-13
72	1.5000			Q14-19	Q14-31	Q14-43
80	1.6667			Q14-20	Q14-32	Q14-44
90	1.8750			Q14-21	Q14-33	Q14-45
96	2.0000			Q14-22	Q14-34	Q14-46
100	2.0833			Q14-2	Q14-8	Q14-14
70	1.4583	Double	Q10	Q14-3	Q14-9	Q14-15
72	1.5000			Q14-23	Q14-35	Q14-47
80	1.6667			Q14-24	Q14-36	Q14-48
90	1.8750			Q15-25	Q14-37	Q14-49
96	2.0000			Q14-26	Q14-38	Q14-50
100	2.0833			Q14-4	Q14-10	Q14-16
70	1.4583	Four	Q12	Q14-5	Q14-11	Q14-17
72	1.5000			Q14-27	Q14-39	Q14-51
80	1.6667			Q14-28	Q14-40	Q14-52
90	1.8750			Q14-29	Q14-41	Q14-53
96	2.0000			Q14-30	Q14-42	Q14-54
100	2.0833			Q14-6	Q14-12	Q14-18

For Unlisted Number of Teeth and Bore Sizes, Consult Factory.

Thread	Pressure Angle
Single	14½°
Double	20°
Four	25°

# ANTI-BACKLASH WORM WHEEL - MINIATURE - 48 PITCH

Single, Double & Four Thread ■ Pin Hub — 1/8", 3/16" & 1/4" Bore



Material:

Gears — Bronze QQB 639 Alloy 464

Hubs — 303 Stainless Steel

Dimen.	Bore		
	1/8	3/16	1/4
A	.1248	.1873	.2498
B	.312	.375	.500
Set Screw	#2-56	#4-40	#6-32

Gear Data				Part Number Bore Size		
No. Teeth	Pitch	Thread	Use With Worm #	.1248	.1873	.2498
40	0.8333	Single	Q8	Q15-1	—	—
50	1.0417			Q15-3	Q17-2	Q19-1
60	1.2500			Q15-5	Q17-4	Q19-3
40	0.8333	Double	Q10	Q15-6	—	—
50	1.0417			Q15-8	Q17-6	Q19-4
60	1.2500			Q15-10	Q17-8	Q19-6
40	0.8333	Four	Q12	Q15-11	—	—
50	1.0417			Q15-13	Q17-10	Q19-7
60	1.2500			Q15-15	Q17-12	Q19-9

For Unlisted Number of Teeth and Other Bore Sizes, Consult Factory.

Thread	Pressure Angle
Single	14½°
Double	20°
Four	25°

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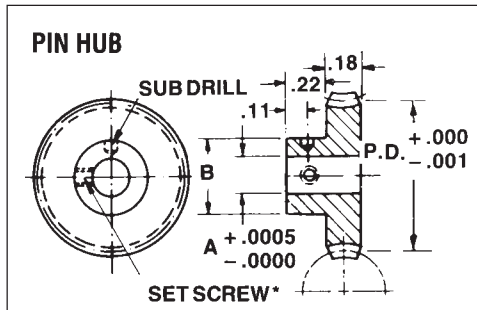
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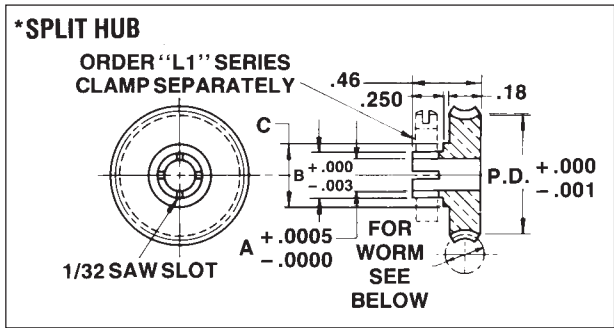
# WORM WHEEL - 64 PITCH — 14 1/2° Pressure Angle

Right Hand ■ Single, Double & Four Thread ■ Pin Hub, Split Hub — 1/8", 3/16" & 1/4" Bores ■ AGMA Quality No. 10



Material: Bronze QQ-B-637  
Alloy 464

$$\text{Ratio} = \frac{\text{No. Teeth}}{\text{No. Threads}}$$



\* Set Screw 90° To Subdrill  
CW/CCW At PIC Option

PIN HUB

Gear Data					Single Thread	Double Thread	Four Thread			
No. Teeth	Pitch Dia.	A	B	Set Screw	Cat. No.	Cat. No.	Cat. No.			
40	.6250	.1248 (1/8)	.312	#2-56	Q1-14	Q3-14	Q5-14			
50	.7813				Q1-15	Q3-15	Q5-15			
60	.9375				Q1-1	Q3-1	Q5-1			
70	1.0938				Q1-16	Q3-16	Q5-16			
80	1.2500				Q1-2	Q3-2	Q5-2			
90	1.4063				Q1-17	Q3-17	Q5-17			
100	1.5625				Q1-3	Q3-3	Q5-3			
110	1.7187				Q1-18	Q3-18	Q5-18			
120	1.8750				Q1-4	Q3-4	Q5-4			
40	.6250				.1873 (3/16)	.375	#4-40	Q1-19	Q3-19	Q5-19
50	.7813							Q1-20	Q3-20	Q5-20
60	.9375							Q1-5	Q3-5	Q5-5
70	1.0938	Q1-21	Q3-21	Q5-21						
80	1.2500	Q1-6	Q3-6	Q5-6						
90	1.4063	Q1-22	Q3-22	Q5-22						
100	1.5625	Q1-7	Q3-7	Q5-7						
110	1.7187	Q1-23	Q3-23	Q5-23						
120	1.8750	Q1-8	Q3-8	Q5-8						
40	.6250	.2498 (1/4)	.500	#6-32				Q1-24	Q3-24	Q5-24
50	.7813							Q1-25	Q3-25	Q5-25
60	.9375							Q1-9	Q3-9	Q5-9
70	1.0938				Q1-26	Q3-26	Q5-26			
80	1.2500				Q1-10	Q3-10	Q5-10			
90	1.4063				Q1-27	Q3-27	Q5-27			
100	1.5625				Q1-11	Q3-11	Q5-11			
110	1.7187				Q1-28	Q3-28	Q5-28			
120	1.8750				Q1-12	Q3-12	Q5-12			
360	5.6250				Q1-13	Q3-13	Q5-13			

Other Numbers of Teeth and Material Available on Request, Consult Factory.

SPLIT HUB

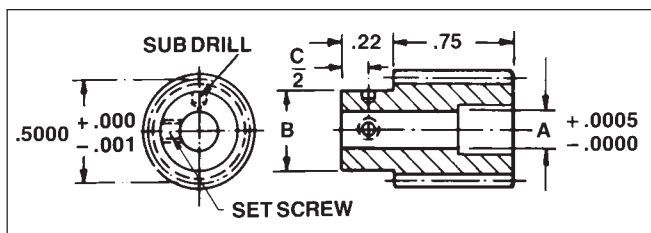
Gear Data							Single Thread	Double Thread	Four Thread
No. Teeth	Pitch Dia.	A	B	C	Clamp No. (Ref.)	Part No.	Part No.	Part No.	
60	.937	.1248 (1/8)	.188	1/4	L1-4	Q1-1-C	Q3-1-C	Q5-1-C	
80	1.250					Q1-2-C	Q3-2-C	Q5-2-C	
100	1.562					Q1-3-C	Q3-3-C	Q5-3-C	
120	1.875					Q1-4-C	Q3-4-C	Q5-4-C	
60	.937	.1873 (3/16)	.250	5/16	L1-5	Q1-5-C	Q3-5-C	Q5-5-C	
80	1.250					Q1-6-C	Q3-6-C	Q5-6-C	
100	1.562					Q1-7-C	Q3-7-C	Q5-7-C	
120	1.875					Q1-8-C	Q3-8-C	Q5-8-C	
60	.937	.2498 (1/4)	.312	3/8	L1-6	Q1-9-C	Q3-9-C	Q5-9-C	
80	1.250					Q1-10-C	Q3-10-C	Q5-10-C	
100	1.562					Q1-11-C	Q3-11-C	Q5-11-C	
120	1.875					Q1-12-C	Q3-12-C	Q5-12-C	
360	5.625					Q1-13-C	Q3-13-C	Q5-13-C	

Other Numbers of Teeth and Material Available on Request, Consult Factory.

Single Thread (Q1 Series) Meshes With Q2 Worm Only  
Double Thread (Q3 Series) Meshes With Q4 Worm Only  
Four Thread (Q5 Series) Meshes With Q6 Worm Only

# WORM - 64 PITCH — 14 1/2° Pressure Angle

Right Hand ■ Single, Double & Four Thread ■ Pin Hub — 1/8", 3/16" & 1/4" Bores ■ AGMA Quality No. 10



Shaft Size	A	B	Set Screw	Use With Single Thread	Use With Double Thread	Use With Four Thread
				Part No.	Part No.	Part No.
1/8	.1248	.312	#2-56	Q2-1	Q4-1	Q6-1
3/16	.1873	.375	#4-40	Q2-2	Q4-2	Q6-2
1/4	.2498	.437	#6-32	Q2-3	Q4-3	Q6-3

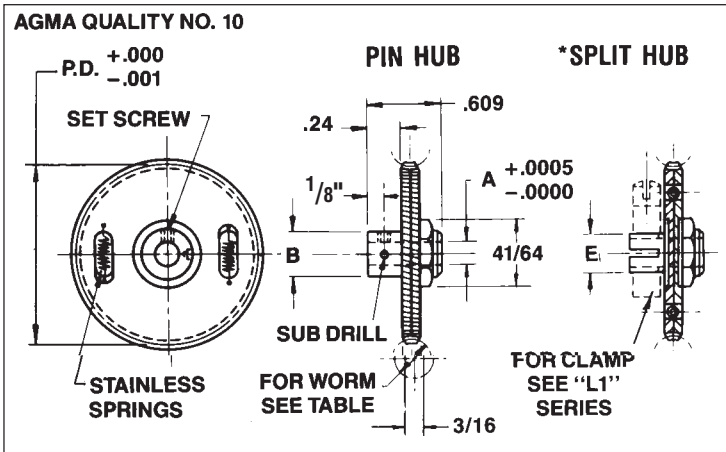
Material: 303 Stainless Steel

Part No.	Lead	Lead Angle
Q2	.04908	1° 47'
Q4	.09817	3° 35'
Q6	.19635	7° 11'



# ANTI-BACKLASH WORM WHEEL - 64 PITCH

14 1/2° Pressure Angle ■ Single, Double & Four Thread ■ Pin Hub — 1/8", 3/16" & 1/4" Bores



Material:

Gears — Bronze QQB 639 Alloy 464  
Hubs — 303 Stainless Steel

\*For Split Hub Add -C to Part No.

Dimen.	Bore		
	1/8	3/16	1/4
A	.1248	.1873	.2498
B	.31	.37	.500
E	.188	.250	.312
Set Screw	#2-56	#4-40	#6-32

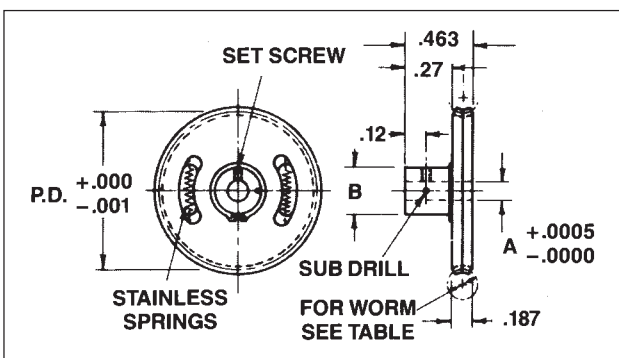
Matched Pairs  
Right Hand

Gear Data				Part Number Bore Size		
No. Teeth	Pitch Dia.	Thread	Use With Worm #	.1248	.1873	.2498
96	1.5000	Single	Q2	Q13-19	Q13-31	Q13-43
100	1.5625			Q13-1	Q13-7	Q13-13
110	1.7187			Q13-20	Q13-32	Q13-44
120	1.8750			Q13-21	Q13-33	Q13-45
130	2.0312			Q13-22	Q13-34	Q13-46
140	2.1875			Q13-2	Q13-8	Q13-14
96	1.5000	Double	Q4	Q13-23	Q13-35	Q13-47
100	1.5625			Q13-3	Q13-9	Q13-15
110	1.7187			Q13-24	Q13-36	Q13-48
120	1.8750			Q13-25	Q13-37	Q13-49
130	2.0312			Q13-26	Q13-38	Q13-50
140	2.1875			Q13-4	Q13-10	Q13-16
96	1.5000	Four	Q6	Q13-27	Q13-39	Q13-51
100	1.5625			Q13-5	Q13-11	Q13-17
110	1.7187			Q13-28	Q13-40	Q13-52
120	1.8750			Q13-29	Q13-41	Q13-53
130	2.0312			Q13-30	Q13-42	Q13-54
140	2.1875			Q13-6	Q13-12	Q13-18

For Unlisted Number of Teeth and Bore Sizes, Consult Factory.

# ANTI-BACKLASH WORM WHEEL - MINIATURE - 64 PITCH

14 1/2° Pressure Angle ■ Single, Double & Four Thread ■ Pin Hub — 1/8", 3/16" & 1/4" Bores



Material:

Gears — Bronze QQB 639 Alloy 464  
Hubs — 303 Stainless Steel

Dimen.	Bore		
	1/8	3/16	1/4
A	.1248	.1873	.2498
B	.312	.375	.500
Set Screw	#2-56	#4-40	#6-32

Gear Data				Part Number Bore Size		
No. Teeth	Pitch Dia.	Thread	Use With Worm #	.1248	.1873	.2498
60	0.9375	Single	Q2	Q16-2	Q18-1	—
70	1.0937			Q16-4	Q18-3	Q20-2
80	1.2500			Q16-5	Q18-4	Q20-3
90	1.4062			Q16-6	Q18-5	Q20-4
60	0.9375	Double	Q4	Q16-8	Q18-6	—
70	1.0937			Q16-10	Q18-8	Q20-6
80	1.2500			Q16-11	Q18-9	Q20-7
90	1.4062			Q16-12	Q18-10	Q20-8
60	0.9375	Four	Q6	Q16-14	Q18-11	—
70	1.0937			Q16-16	Q18-13	Q20-10
80	1.2500			Q16-17	Q18-14	Q20-11
90	1.4062			Q16-18	Q18-15	Q20-12

For Unlisted Number of Teeth and Other Bore Sizes, Consult Factory.

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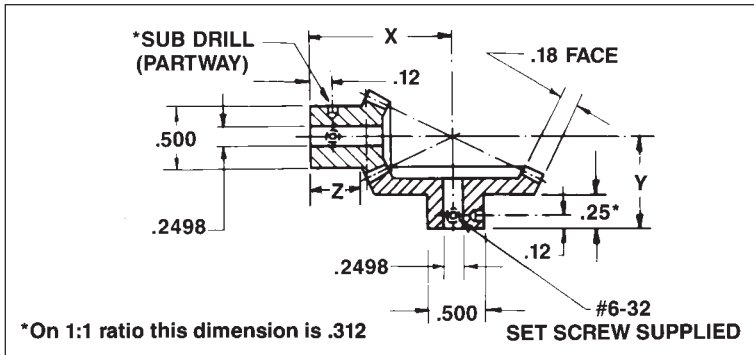
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# MITER & BEVEL GEARS- 48 PITCH — 20° Pressure Angle

Pin Hub — 1/4" Bore ■ Matched Pairs ■ AGMA Quality No. 10 and 12



Material: 303 Stainless Steel — S  
2024-T4 Aluminum (Anodized Before Cutting) — A

\*Sub Drill 90° To Set Screw Location Optional

Miter Gear Sets (1:1 Ratio)  
Consists of 2 Gears of Identical Dimensions

Tolerances	Q10	Q12
Bore	+ .0005 - .0000	+ .0003 - .0000
Pitch Diameter	+ .000 - .001	+ .0000 - .0007
Total Composite Tolerance	FOR AGMA QUALITY STANDARDS SEE PAGE 12-2	
Tooth to Tooth Tolerance	FOR AGMA QUALITY STANDARDS SEE PAGE 12-2	

Gear Data							Part No. Per Set
Ratio	No. Teeth	Material	P.D.	X	Y	Z	
1:1	30/30	S/A S/S A/A	.625/ .625	.687	.687	.312	N3-1 N3-1-S N3-1-A
1:1½	30/45	S/A S/S A/A	.625/ .937	.812	.687	.302	N3-5 N3-5-S N3-5-A
1:2	30/60	S/A S/S A/A	.625/1.250	.937	.687	.281	N3-2 N3-2-S N3-2-A
1:3	30/90	S/A S/S A/A	.625/1.875	1.250	.687	.292	N3-3 N3-3-S N3-3-A
1:4	30/120	S/A S/S A/A	.625/2.500	1.531	.687	.265	N3-4 N3-4-S N3-4-A

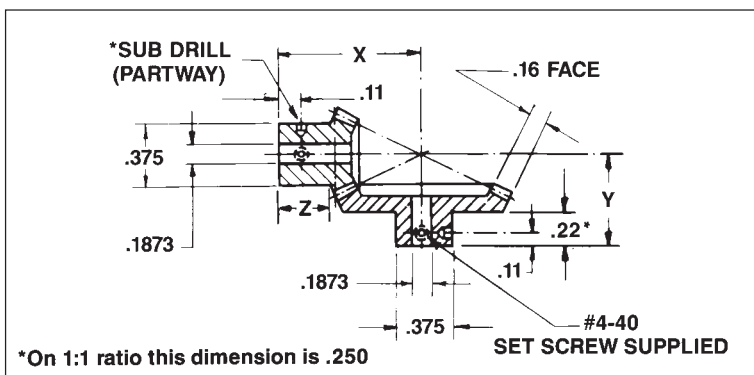
Split Hubs, Other Ratios and Bores Available on Request, Consult Factory.

To order AGMA 12 Gears, add — Q12 to Part No.

When ordering individual parts, specify set no. along with individual part.  
EXAMPLE: N3-1 (Pinion Only) or N3-1 (Gear Only).

# MITER & BEVEL GEARS- 64 PITCH — 20° Pressure Angle

Pin Hub — 3/16" Bore ■ Matched Pairs ■ AGMA Quality No. 10 and 12



Material: 303 Stainless Steel — S  
2024-T4 Aluminum (Anodized Before Cutting) — A

\*Sub Drill 90° To Set Screw Location Optional

Miter Gear Sets (1:1 Ratio)  
Consists of 2 Gears of Identical Dimensions

Tolerances	Q10	Q12
Bore	+ .0005 - .0000	+ .0003 - .0000
Pitch Diameter	+ .000 - .001	+ .0000 - .0007
Total Composite Tolerance	FOR AGMA QUALITY STANDARDS SEE PAGE 12-2	
Tooth to Tooth Tolerance	FOR AGMA QUALITY STANDARDS SEE PAGE 12-2	

Gear Data							Part No. Per Set
Ratio	No. Teeth	Material	P.D.	X	Y	Z	
1:1	32/32	S/A S/S A/A	.500/ .500	.562	.562	.250	N2-1 N2-1-S N2-1-A
1:1½	32/48	S/A S/S A/A	.500/ .750	.656	.562	.248	N2-8 N2-8-S N2-8-A
1:2	32/64	S/A S/S A/A	.500/1.000	.750	.562	.218	N2-2 N2-2-S N2-2-A
1:3	32/96	S/A S/S A/A	.500/1.500	1.000	.562	.228	N2-3 N2-3-S N2-3-A
1:4	32/128	S/A S/S A/A	.500/2.000	1.250	.562	.234	N2-4 N2-4-S N2-4-A

Split Hubs, Other Ratios and Bores Available on Request, Consult Factory.

To order AGMA 12 Gears, add — Q12 to Part No.

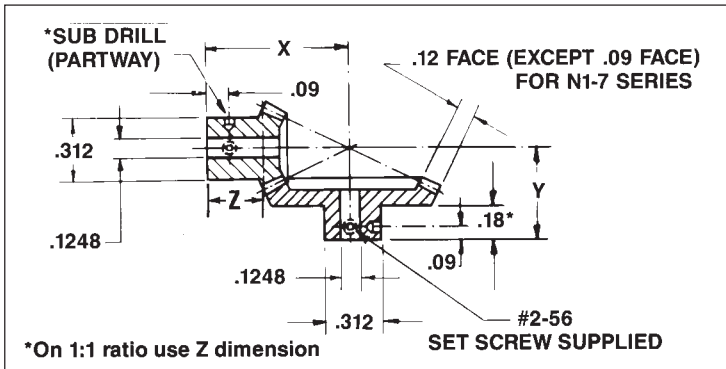
When ordering individual parts, specify set no. along with individual part.  
EXAMPLE: N3-1 (Pinion Only) or N3-1 (Gear Only).

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# MITER & BEVEL GEARS- 72 PITCH — 20° Pressure Angle

Pin Hub — 1/8" Bore ■ Matched Pairs ■ AGMA Quality No. 10 and 12



Material: 303 Stainless Steel — S  
2024-T4 Aluminum (Anodized Before Cutting) — A

\*Sub Drill 90° To Set Screw Location Optional

Miter Gear Sets (1:1 Ratio)  
Consists of 2 Gears of Identical Dimensions

Tolerances	Q10	Q12
<b>Bore</b>	+ .0005 - .0000	+ .0003 - .0000
<b>Pitch Diameter</b>	+ .000 - .001	+ .0000 - .0007
<b>Total Composite Tolerance</b>	FOR AGMA QUALITY STANDARDS SEE PAGE 12-2	
<b>Tooth to Tooth Tolerance</b>	FOR AGMA QUALITY STANDARDS SEE PAGE 12-2	

Gear Data							Part No. Per Set
Ratio	No. Teeth	Material	P.D.	X	Y	Z	
1:1	24/24	S/A S/S A/A	.333/ .333	.437	.437	.260	N1-7 N1-7-S N1-7-A
1:1	36/36	S/A S/S A/A	.500/ .500	.531	.531	.187	N1-1 N1-1-S N1-1-A
1:1½	36/54	S/A S/S A/A	.500/ .750	.640	.531	.215	N1-8 N1-8-S N1-8-A
1:2	36/72	S/A S/S A/A	.500/1.000	.750	.531	.203	N1-2 N1-2-S N1-2-A
1:3	36/108	S/A S/S A/A	.500/1.500	1.000	.531	.218	N1-3 N1-3-S N1-3-A
1:4	36/144	S/A S/S A/A	.500/2.000	1.250	.531	.228	N1-9 N1-9-S N1-9-A

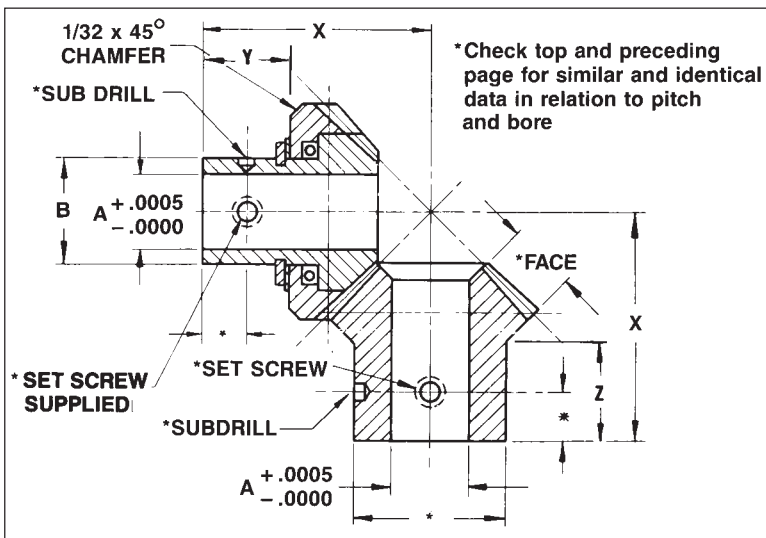
Split Hubs, Other Ratios and Bores Available on Request, Consult Factory.

To order AGMA 12 Gears, add - Q12 to Part No.

When ordering individual parts, specify set no. along with individual part.  
EXAMPLE: N1-7 (Pinion Only) or N1-7 (Gear Only).

# ANTI-BACKLASH MITER GEARS-48, 64 & 72 PITCH — 20° Pressure Angle

Pin Hub — 1/8", 3/16" & 1/4" Bores ■ Matched Pairs ■ AGMA Quality No. 10 ■ 1:1 Ratio Only



Gear Data									Part No. Per Set
Pitch	No. Teeth	Material	P.D.	A	B	X	Y	Z	
72	36/36	S/A	.500/ .500	.1248	1/4	.531	.185	.187	N1-1-AB
	36/36	S/S	.500/ .500	.1248	1/4	.531	.185	.187	N1-1-AB-S
64	32/32	S/A	.500/ .500	.1873	17/64	.562	.212	.250	N2-1-AB
	32/32	S/S	.500/ .500	.1873	17/64	.562	.212	.250	N2-1-AB-S
48	30/30	S/A	.625/ .625	.2498	3/8	.687	.257	.312	N3-1-AB
	30/30	S/S	.625/ .625	.2498	3/8	.687	.257	.312	N3-1-AB-S

Other Ratios and Bores Available, Consult Factory.

Material: Anti-Backlash Gear — 303 Stainless Steel  
Mating Gear — 303 Stainless Steel or 2024-T4  
Aluminum (Anodized Before Cutting) — A

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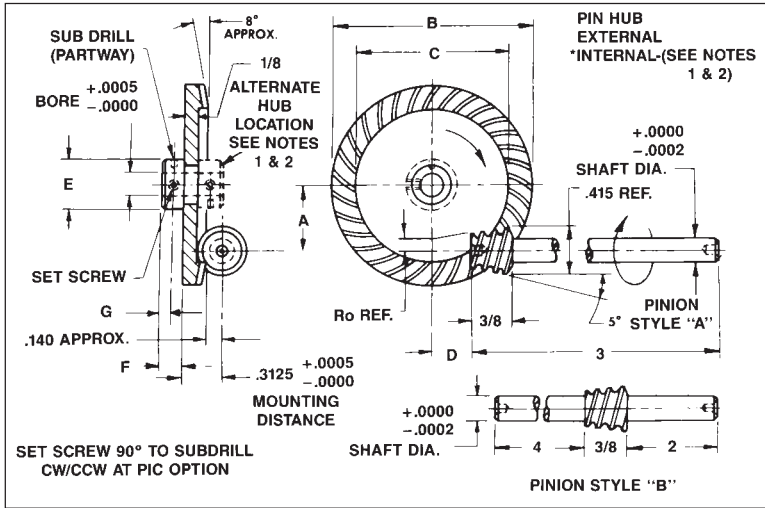
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# PRECISION SPIRAL GEARS

Pin Hub ■ Left Hand ■ 1/8", 3/16" & 1/4" Shafts & Bores



Material: Gears — Bronze ASTM B21, Alloy 464  
Pinions and Hubs — 303 Stainless Steel

Bores			Gear — Runs With All Pinions					
.1248 Dia.	.1873 Dia.	.2498 Dia.	Ratio	A	B	C	D	Ro
EK1-1	EK2-1	EK3-1	36:1	.330	1.375	.868	.281	.1501
EK1-2	EK2-2	EK3-2	40:1	.368	1.453	.948	.297	.1487
EK1-5	EK2-5	EK3-5	70:1	.650	2.038	1.553	.411	.1388
EK1-6	EK2-6	EK3-6	80:1	.744	2.233	1.755	.450	.1353
EK1-7	EK2-7	EK3-7	90:1	.837	2.427	1.957	.488	.1320
EK1-8	EK2-8	EK3-8	100:1	.931	2.622	2.158	.526	.1287
EK1-9	EK2-9	EK3-9	120:1	1.119	3.012	2.562	.602	.1220
EK1-11	EK2-11	EK3-11	180:1	1.683	4.182	3.772	.832	.1019
EK1-12	EK2-12	EK3-12	200:1	1.871	4.571	4.175	.908	.0953

Split Hubs Available On Request, Consult Factory.

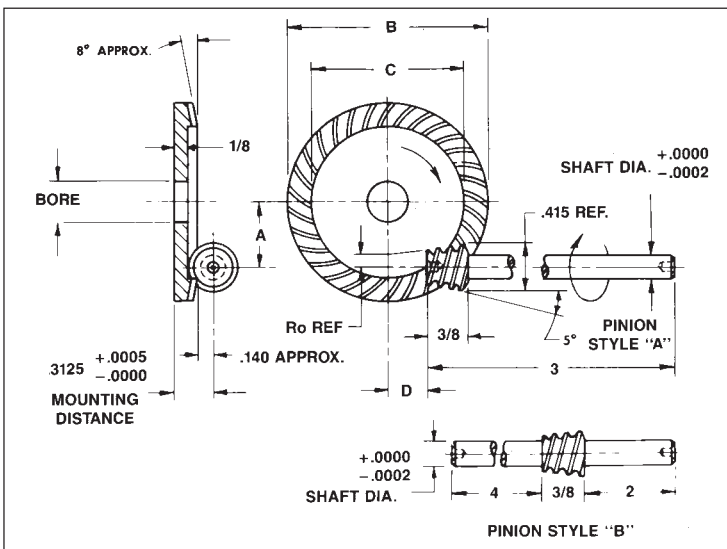
Notes: 1. \*For Internal Hub, add -X to Part Number.  
2. Check Clearance between Pinion and Hub when using Gears with Ratios of 36:1 and 40:1.

Dimen.	Hub Data		
	EK1	EK2	EK3
E	7/16	7/16	1/2
F	.22	.22	.25
G	.11	.11	.12
Set Screw	#2-56	#4-40	#6-32

Pinions		
Part No.	Style	Shaft Dia.
EJ1-A		.1247
EJ2-A	"A"	.1872
EJ3-A		.2497
EJ1-B		.1247
EJ2-B	"B"	.1872
EJ3-B		.2497

# PRECISION SPIRAL GEARS

Hubless ■ Left Hand ■ 3/8", 11/16" Bores



Material: Gears — Bronze ASTM B21, Alloy 464  
Pinions and Hubs — 303 Stainless Steel

Bores		Gear — Runs With All Pinions							
.3750	.6875	Ratio	A	B	C	D	Ro		
+.0000	+.0003	EK13-1	EK14-1	36:1	.330	1.375	.868	.281	.1501
-.0002	-.0000	EK13-2	EK14-2	40:1	.368	1.453	.948	.297	.1487
		EK13-5	EK14-5	70:1	.650	2.038	1.553	.411	.1388
		EK13-6	EK14-6	80:1	.744	2.233	1.755	.450	.1353
		EK13-7	EK14-7	90:1	.837	2.427	1.957	.488	.1320
		EK13-8	EK14-8	100:1	.931	2.622	2.158	.526	.1287
		EK13-9	EK14-9	120:1	1.119	3.012	2.562	.602	.1220
		EK13-10	EK14-10	150:1	1.401	3.597	3.167	.717	.1120
		EK13-11	EK14-11	180:1	1.683	4.182	3.772	.832	.1019
		EK13-12	EK14-12	200:1	1.871	4.571	4.175	.908	.0953

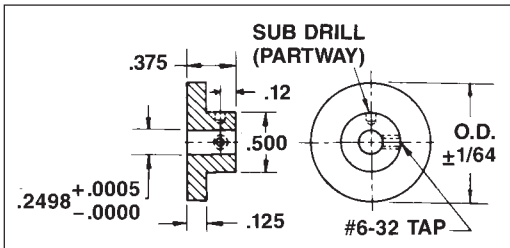
Split Hubs Available On Request, Consult Factory.

Pinions		
Part No.	Style	Shaft Dia.
EJ1-A		.1247
EJ2-A	"A"	.1872
EJ3-A		.2497
EJ1-B		.1247
EJ2-B	"B"	.1872
EJ3-B		.2497

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# GEAR BLANKS — NO TEETH

Pin Hub —  $\frac{1}{8}$ " Face Width ■  $\frac{1}{4}$ " Bore

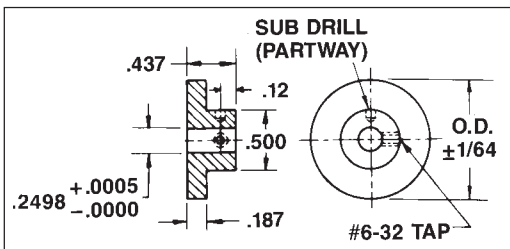


Material: 303 Stainless Steel  
2024-T4 Aluminum (Anodized)

Outside Dia.	Stainless Steel Part No.	Aluminum Part No.
1	BP1-8	BP2-8
1½	BP1-12	BP2-12
2	BP1-16	BP2-16
2½	BP1-20	BP2-20
4	BP1-32	BP2-32

# GEAR BLANKS — NO TEETH

Pin Hub —  $\frac{3}{16}$ " Face Width ■  $\frac{1}{4}$ " Bore

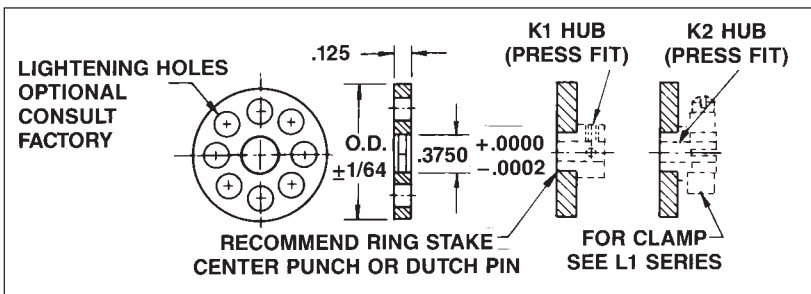


Material: 303 Stainless Steel  
2024-T4 Aluminum (Anodized)

Outside Dia.	Stainless Steel Part No.	Aluminum Part No.
1	BQ1-8	BQ2-8
1½	BQ1-12	BQ2-12
2	BQ1-16	BQ2-16
2½	BQ1-20	BQ2-20
4	BQ1-32	BQ2-32

# GEAR BLANKS — NO TEETH

Hubless —  $\frac{1}{8}$ " Face Width ■  $\frac{3}{8}$ " Bore

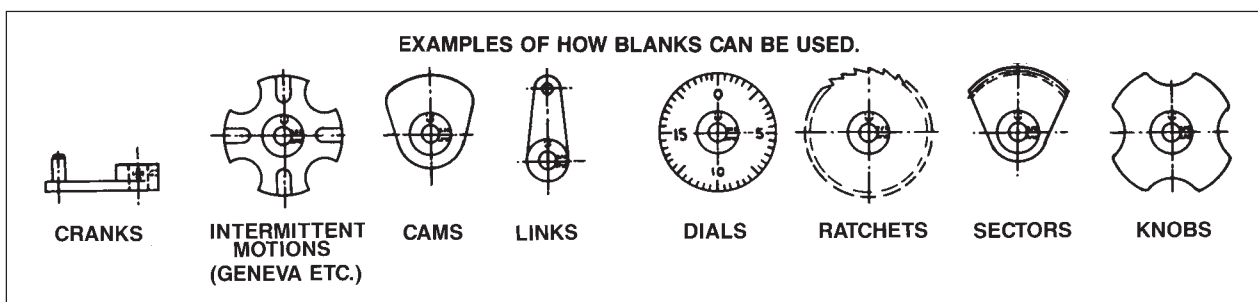


Material: 303 Stainless Steel  
2024-T4 Aluminum (Anodized)

Outside Dia.	Stainless Steel Part No.	Aluminum Part No.
1	BU1-8	BU2-8
1½	BU1-12	BU2-12
2	BU1-16	BU2-16
2½	BU1-20	BU2-20
3	BU1-24	BU2-24
3½	BU1-28	BU2-28
4	BU1-32	BU2-32

Other Materials, Bores, Face Widths, Diameters On Request.  
Clamp Type Blanks Available, Consult Factory.  
Modifications Quoted On Request.

## EXAMPLES OF HOW BLANKS CAN BE USED.

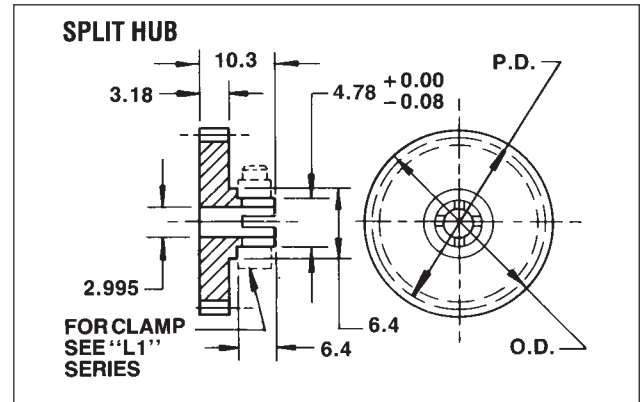
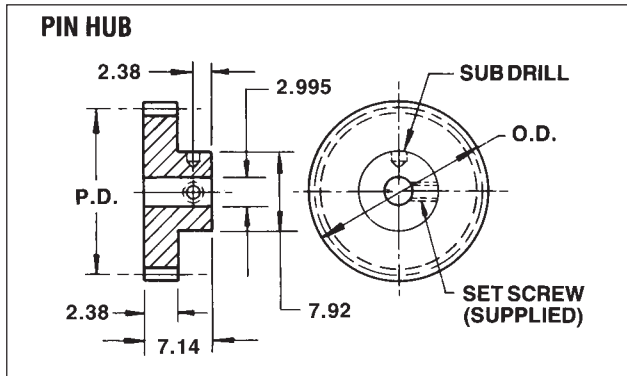




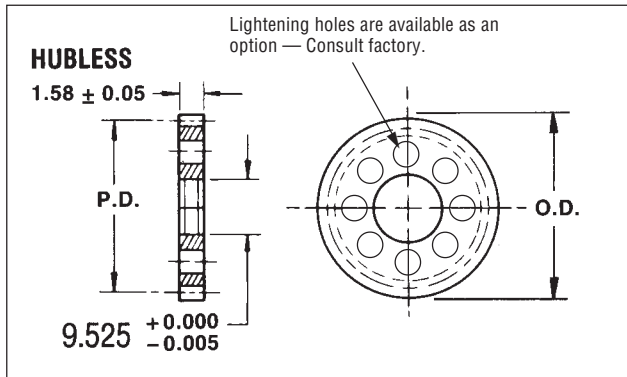
# SPUR GEARS — 0.25 Module ■ 1.58, 2.38 and 3.18mm Face Width ■ 20° Pressure Angle

Pin Hub — 3mm Bore ■ Split Hub — 3mm Bore ■ Hubless — 9.525mm Bore

All Dimensions are millimeters



Material: 303 Stainless Steel  
2024-T4 Aluminum (Anodized Before Cutting)



## Tolerances

Quality Number	T7 *	T6	T5
<b>Bore</b>	+0.013 -0.000	+0.008 -0.000	+0.005 -0.000
<b>Pitch Diameter</b>	+0.000 -0.025	+0.000 -0.018	+0.000 -0.013
<b>Outside Diameter</b>	+0.00 -0.05	+0.00 -0.04	+0.00 -0.03
<b>Total Composite and Tooth to Tooth Tolerance</b>	Refer to Technical Reference 12-2		

## \* Standard Quality Level —

No suffix on part number when ordering standard quality level. i.e. **MSG3-24**

Specify quality level for T6 / T5 orders. i.e. **MSG3-24-T5**

For Gear Hubs See Pages 12-67 & 12-68

Gear Data			Stainless Steel Part No.			Aluminum Part No.		
No. Teeth	Pitch Dia.	Outside Dia.	Pin Hub	Split Hub	Hubless	Pin Hub	Split Hub	Hubless
†24	6.0	6.5	MSG3-24	MSG35-24	—	MSG4-24	MSG36-24	—
†28	7.0	7.5	MSG3-28	MSG35-28	—	MSG4-28	MSG36-28	—
32	8.0	8.5	MSG3-32	MSG35-32	—	MSG4-32	MSG36-32	—
36	9.0	9.5	MSG3-36	MSG35-36	—	MSG4-36	MSG36-36	—
40	10.0	10.5	MSG3-40	MSG35-40	—	MSG4-40	MSG36-40	—
48	12.0	12.5	MSG3-48	MSG35-48	—	MSG4-48	MSG36-48	—
54	13.5	14.0	MSG3-54	MSG35-54	—	MSG4-54	MSG36-54	—
60	15.0	15.5	MSG3-60	MSG35-60	MHS1-60	MSG4-60	MSG36-60	MHS2-60
72	18.0	18.5	MSG3-72	MSG35-72	MHS1-72	MSG4-72	MSG36-72	MHS2-72
84	21.0	21.5	MSG3-84	MSG35-84	MHS1-84	MSG4-84	MSG36-84	MHS2-84
96	24.0	24.5	MSG3-96	MSG35-96	MHS1-96	MSG4-96	MSG36-96	MHS2-96
100	25.0	25.5	MSG3-100	MSG35-100	MHS1-100	MSG4-100	MSG36-100	MHS2-100
120	30.0	30.5	MSG3-120	MSG35-120	MHS1-120	MSG4-120	MSG36-120	MHS2-120
132	33.0	33.5	MSG3-132	—	MHS1-132	MSG4-132	—	MHS2-132
144	36.0	36.5	MSG3-144	—	MHS1-144	MSG4-144	—	MHS2-144
168	42.0	42.5	MSG3-168	—	MHS1-168	MSG4-168	—	MHS2-168
180	45.0	45.5	MSG3-180	—	MHS1-180	MSG4-180	—	MHS2-180
192	48.0	48.5	MSG3-192	—	MHS1-192	MSG4-192	—	MHS2-192
216	54.0	54.5	—	—	MHS1-216	—	—	MHS2-216
240	60.0	60.5	—	—	MHS1-240	—	—	MHS2-240
264	66.0	66.5	—	—	MHS1-264	—	—	MHS2-264
288	72.0	72.5	—	—	MHS1-288	—	—	MHS2-288

†Hob Cuts Into Hub

Other Bore Sizes Available, Consult Factory.

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

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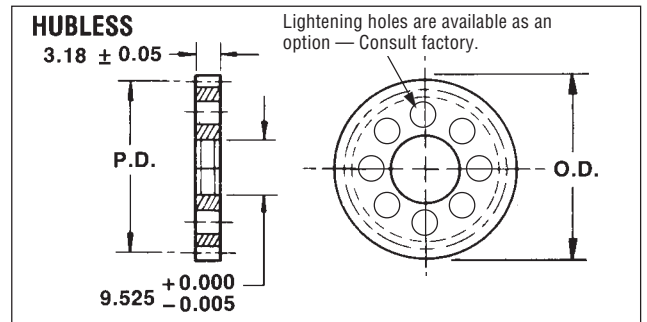
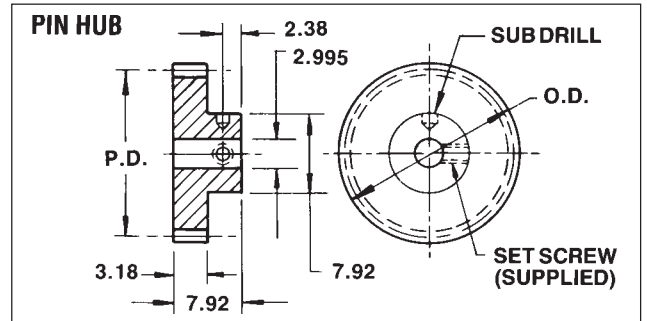
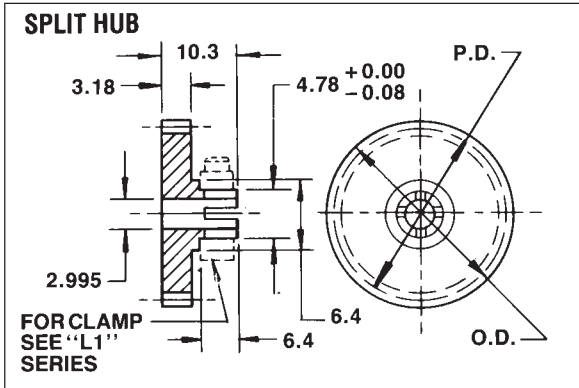
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# SPUR GEARS — 0.3 Module ■ 3.18mm Face Width ■ 20° Pressure Angle

Pin Hub — 3mm Bore ■ Split Hub — 3mm Bore ■ Hubless — 9.525mm Bore

All Dimensions in Millimeters



Material: 303 Stainless Steel  
2024-T4 Aluminum (Anodized Before Cutting)

For Gear Hubs See Pages 12-67 & 12-68

Gear Data			Stainless Steel Part No.			Aluminum Part No.		
No. Teeth	Pitch Dia.	Outside Dia.	Pin Hub	Split Hub	Hubless	Pin Hub	Split Hub	Hubless
†20	6.0	6.6	MSG5-20	—	—	MSG6-20	—	—
†24	7.2	7.8	MSG5-24	—	—	MSG6-24	—	—
†25	7.5	8.1	MSG5-25	—	—	MSG6-25	—	—
†26	7.8	8.4	MSG5-26	—	—	MSG6-26	—	—
†27	8.1	8.7	MSG5-27	MSG37-27	—	MSG6-27	MSG38-27	—
†30	9.0	9.6	MSG5-30	MSG37-30	—	MSG6-30	MSG38-30	—
†32	9.6	10.2	MSG5-32	MSG37-32	—	MSG6-32	MSG38-32	—
34	10.2	10.8	MSG5-34	MSG37-34	—	MSG6-34	MSG38-34	—
35	10.5	11.1	MSG5-35	MSG37-35	—	MSG6-35	MSG38-35	—
36	10.8	11.4	MSG5-36	MSG37-36	—	MSG6-36	MSG38-36	—
40	12.0	12.6	MSG5-40	MSG37-40	—	MSG6-40	MSG38-40	—
50	15.0	15.6	MSG5-50	MSG37-50	—	MSG6-50	MSG38-50	—
55	16.5	17.1	MSG5-55	MSG37-55	MHS3-55	MSG6-55	MSG38-55	MHS4-55
60	18.0	18.6	MSG5-60	MSG37-60	MHS3-60	MSG6-60	MSG38-60	MHS4-60
70	21.0	21.6	MSG5-70	MSG37-70	MHS3-70	MSG6-70	MSG38-70	MHS4-70
75	22.5	23.1	MSG5-75	MSG37-75	MHS3-75	MSG6-75	MSG38-75	MHS4-75
80	24.0	24.6	MSG5-80	MSG37-80	MHS3-80	MSG6-80	MSG38-80	MHS4-80
85	25.5	26.1	MSG5-85	MSG37-85	MHS3-85	MSG6-85	MSG38-85	MHS4-85
90	27.0	27.6	MSG5-90	MSG37-90	MHS3-90	MSG6-90	MSG38-90	MHS4-90
100	30.0	30.6	MSG5-100	MSG37-100	MHS3-100	MSG6-100	MSG38-100	MHS4-100
110	33.0	33.6	MSG5-110	MSG37-110	MHS3-110	MSG6-110	MSG38-110	MHS4-110
120	36.0	36.6	MSG5-120	MSG37-120	MHS3-120	MSG6-120	MSG38-120	MHS4-120
130	39.0	39.6	MSG5-130	—	MHS3-130	MSG6-130	—	MHS4-130
140	42.0	42.6	MSG5-140	—	MHS3-140	MSG6-140	—	MHS4-140
150	45.0	45.6	MSG5-150	—	MHS3-150	MSG6-150	—	MHS4-150
160	48.0	48.6	MSG5-160	—	MHS3-160	MSG6-160	—	MHS4-160
170	51.0	51.6	MSG5-170	—	MHS3-170	MSG6-170	—	MHS4-170
180	54.0	54.6	MSG5-180	—	MHS3-180	MSG6-180	—	MHS4-180
200	60.0	60.6	—	—	MHS3-200	—	—	MHS4-200
216	64.8	65.4	—	—	MHS3-216	—	—	MHS4-216
240	72.0	72.6	—	—	MHS3-240	—	—	MHS4-240
260	78.0	78.6	—	—	MHS3-260	—	—	MHS4-260
320	96.0	96.6	—	—	MHS3-320	—	—	MHS4-320

### Tolerances

Quality Number	T7 *	T6	T5
Bore	+0.013 -0.000	+0.008 -0.000	+0.005 -0.000
Pitch Diameter	+0.000 -0.025	+0.000 -0.018	+0.000 -0.013
Outside Diameter	+0.00 -0.05	+0.00 -0.04	+0.00 -0.03
Total Composite and Tooth to Tooth Tolerance	Refer to Technical Reference 12-2		

### \* Standard Quality Level —

No suffix on part number when ordering standard quality level. i.e. **MHS3-60**  
Specify quality level for T6 / T5 orders. i.e. **MHS3-60-T5**

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

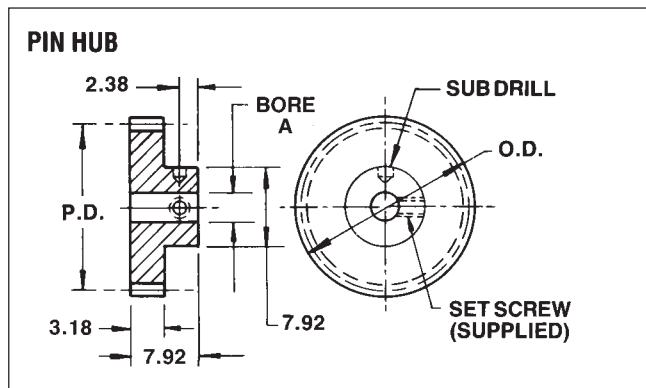
†Hob Cuts Into Hub

Other Bore Sizes Available, Consult Factory.

# SPUR GEARS — 0.4 Module ■ 3.18mm Face Width ■ 20° Pressure Angle

## Pin Hub — 3 and 4mm Bores

All Dimensions in Millimeters



Material: 303 Stainless Steel  
2024-T4 Aluminum (Anodized Before Cutting)

Dimen.	Bore	
	3 mm	4 mm
A	2.995	3.995

### Tolerances

Quality Number	T7 *	T6	T5
<b>Bore</b>	+0.013 -0.000	+0.008 -0.000	+0.005 -0.000
<b>Pitch Diameter</b>	+0.000 -0.025	+0.000 -0.018	+0.000 -0.013
<b>Outside Diameter</b>	+0.00 -0.05	+0.00 -0.04	+0.00 -0.03
<b>Total Composite and Tooth to Tooth Tolerance</b>	Refer to Technical Reference 12-2		

### \* Standard Quality Level —

No suffix on part number when ordering standard quality level. i.e. **MSG7-25**  
Specify quality level for T6 / T5 orders. i.e. **MSG7-25-T5**

Gear Data			Stainless Steel Part No.		Aluminum Part No.	
No. Teeth	Pitch Dia.	Outside Dia.	3 mm Bore	4 mm Bore	3 mm Bore	4 mm Bore
24	9.6	10.4	MSG7-24	MSG9-24	MSG8-24	MSG10-24
25	10.0	10.8	MSG7-25	MSG9-25	MSG8-25	MSG10-25
26	10.4	11.2	MSG7-26	MSG9-26	MSG8-26	MSG10-26
28	11.2	12.0	MSG7-28	MSG9-28	MSG8-28	MSG10-28
30	12.0	12.8	MSG7-30	MSG9-30	MSG8-30	MSG10-30
32	12.8	13.6	MSG7-32	MSG9-32	MSG8-32	MSG10-32
36	14.4	15.2	MSG7-36	MSG9-36	MSG8-36	MSG10-36
40	16.0	16.8	MSG7-40	MSG9-40	MSG8-40	MSG10-40
42	16.8	17.6	MSG7-42	MSG9-42	MSG8-42	MSG10-42
44	17.6	18.4	MSG7-44	MSG9-44	MSG8-44	MSG10-44
46	18.4	19.2	MSG7-46	MSG9-46	MSG8-46	MSG10-46
48	19.2	20.0	MSG7-48	MSG9-48	MSG8-48	MSG10-48
50	20.0	20.8	MSG7-50	MSG9-50	MSG8-50	MSG10-50
60	24.0	24.8	MSG7-60	MSG9-60	MSG8-60	MSG10-60
64	25.6	26.4	MSG7-64	MSG9-64	MSG8-64	MSG10-64
70	28.0	28.8	MSG7-70	MSG9-70	MSG8-70	MSG10-70
72	28.8	29.6	MSG7-72	MSG9-72	MSG8-72	MSG10-72
75	30.0	30.8	MSG7-75	MSG9-75	MSG8-75	MSG10-75
80	32.0	32.8	MSG7-80	MSG9-80	MSG8-80	MSG10-80
84	33.6	34.4	MSG7-84	MSG9-84	MSG8-84	MSG10-84
85	34.0	34.8	MSG7-85	MSG9-85	MSG8-85	MSG10-85
90	36.0	36.8	MSG7-90	MSG9-90	MSG8-90	MSG10-90
95	38.0	38.8	MSG7-95	MSG9-95	MSG8-95	MSG10-95
96	38.4	39.2	MSG7-96	MSG9-96	MSG8-96	MSG10-96
100	40.0	40.8	MSG7-100	MSG9-100	MSG8-100	MSG10-100
105	42.0	42.8	MSG7-105	MSG9-105	MSG8-105	MSG10-105
120	48.0	48.8	MSG7-120	MSG9-120	MSG8-120	MSG10-120
160	64.0	64.8	MSG7-160	MSG9-160	MSG8-160	MSG10-160

Other Bore Sizes Available, Consult Factory.

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number. Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

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# SPUR GEARS — 0.4 Module ■ 3.18 and 4.76mm Face Width ■ 20° Pressure Angle

Pin Hub — 6mm Bore

All Dimensions in Millimeters

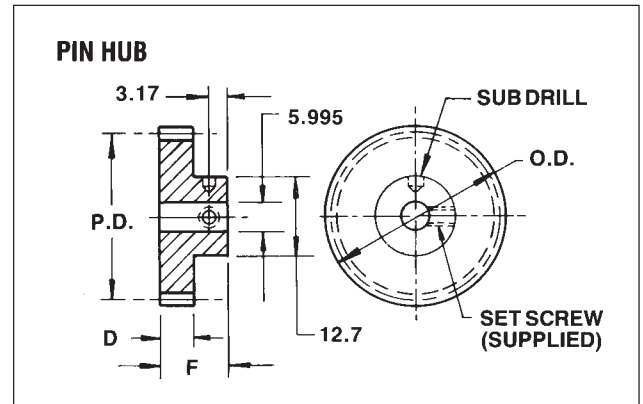
Gear Data			Stainless Steel Part No.		Aluminum Part No.	
No. Teeth	Pitch Dia.	Outside Dia.	3.18 mm Face	4.76 mm Face	3.18 mm Face	4.76 mm Face
†26	10.4	11.2	MSG11-26	MSG13-26	MSG12-26	MSG14-26
†29	11.6	12.4	MSG11-29	MSG13-29	MSG12-29	MSG14-29
†30	12.0	12.8	MSG11-30	MSG13-30	MSG12-30	MSG14-30
†32	12.8	13.6	MSG11-32	MSG13-32	MSG12-32	MSG14-32
36	14.4	15.2	MSG11-36	MSG13-36	MSG12-36	MSG14-36
40	16.0	16.8	MSG11-40	MSG13-40	MSG12-40	MSG14-40
42	16.8	17.6	MSG11-42	MSG13-42	MSG12-42	MSG14-42
48	19.2	20.0	MSG11-48	MSG13-48	MSG12-48	MSG14-48
50	20.0	20.8	MSG11-50	MSG13-50	MSG12-50	MSG14-50
55	22.0	22.8	MSG11-55	MSG13-55	MSG12-55	MSG14-55
56	22.4	23.2	MSG11-56	MSG13-56	MSG12-56	MSG14-56
60	24.0	24.8	MSG11-60	MSG13-60	MSG12-60	MSG14-60
64	25.6	26.4	MSG11-64	MSG13-64	MSG12-64	MSG14-64
72	28.8	29.6	MSG11-72	MSG13-72	MSG12-72	MSG14-72
75	30.0	30.8	MSG11-75	MSG13-75	MSG12-75	MSG14-75
80	32.0	32.8	MSG11-80	MSG13-80	MSG12-80	MSG14-80
84	33.6	34.4	MSG11-84	MSG13-84	MSG12-84	MSG14-84
85	34.0	34.8	MSG11-85	MSG13-85	MSG12-85	MSG14-85
88	35.2	36.0	MSG11-88	MSG13-88	MSG12-88	MSG14-88
96	38.4	39.2	MSG11-96	MSG13-96	MSG12-96	MSG14-96
100	40.0	40.8	MSG11-100	MSG13-100	MSG12-100	MSG14-100
104	41.6	42.4	MSG11-104	MSG13-104	MSG12-104	MSG14-104
112	44.8	45.6	MSG11-112	MSG13-112	MSG12-112	MSG14-112
120	48.0	48.8	MSG11-120	MSG13-120	MSG12-120	MSG14-120
127	50.8	51.6	MSG11-127	MSG13-127	MSG12-127	MSG14-127
140	56.0	56.8	MSG11-140	MSG13-140	MSG12-140	MSG14-140
144	57.6	58.4	MSG11-144	MSG13-144	MSG12-144	MSG14-144
160	64.0	64.8	MSG11-160	MSG13-160	MSG12-160	MSG14-160

†Hob Cuts Into Hub

Other Bore Sizes Available, Consult Factory.

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.



Material: 303 Stainless Steel

2024-T4 Aluminum (Anodized Before Cutting)

Dimen.		
D	3.18	4.76
F	9.52	11.10

#### Tolerances

Quality Number	T7 *	T6	T5
Bore	+ 0.013 - 0.000	+ 0.008 - 0.000	+ 0.005 - 0.000
Pitch Diameter	+ 0.000 - 0.025	+ 0.000 - 0.018	+ 0.000 - 0.013
Outside Diameter	+ 0.00 - 0.05	+ 0.00 - 0.04	+ 0.00 - 0.03
Total Composite and Tooth to Tooth Tolerance	Refer to Technical Reference 12-2		

\* Standard Quality Level —

No suffix on part number when ordering standard quality level. i.e. **MSG11-26**

Specify quality level for T6 / T5 orders.

i.e. **MSG11-26-T5**

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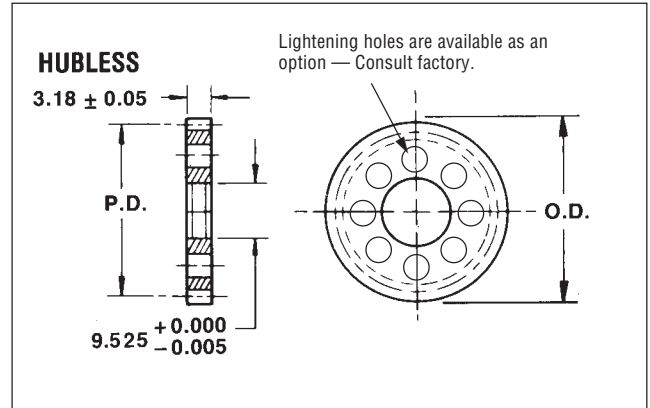
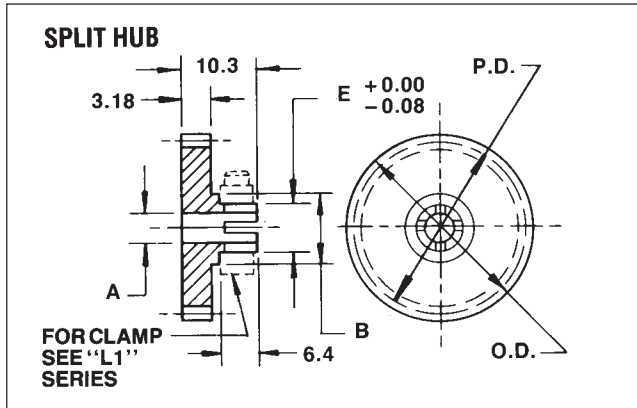
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# SPUR GEARS — 0.4 Module ■ 3.18mm Face Width ■ 20° Pressure Angle

Split Hub — 4 and 6mm Bores ■ Hubless — 9.52mm Bore

All Dimensions in Millimeters



Material: 303 Stainless Steel  
2024-T4 Aluminum (Anodized Before Cutting)

Dim	Bore	
	4	6
A	3.995	5.995
B	7.92	9.52
C	6.4	7.92

Gear Data			Stainless Steel Part No.			Aluminum Part No.		
			Split Hub		Hubless	Split Hub		Hubless
No. Teeth	Pitch Dia.	Outside Dia.	4 mm Bore	6 mm Bore	9.525 Bore	4 mm Bore	6 mm Bore	9.525 Bore
†22	8.8	9.6	MSG39-22	MSG41-22	—	MSG40-22	MSG42-22	—
†24	9.6	10.4	MSG39-24	MSG41-24	—	MSG40-24	MSG42-24	—
†25	10.0	10.8	MSG39-25	MSG41-25	—	MSG40-25	MSG42-25	—
30	12.0	12.8	MSG39-30	MSG41-30	—	MSG40-30	MSG42-30	—
32	12.8	13.6	MSG39-32	MSG41-32	—	MSG40-32	MSG42-32	—
36	14.4	15.2	MSG39-36	MSG41-36	—	MSG40-36	MSG42-36	—
38	15.2	16.0	MSG39-38	MSG41-38	—	MSG40-38	MSG42-38	—
40	16.0	16.8	MSG39-40	MSG41-40	—	MSG40-40	MSG42-40	—
48	19.2	20.0	MSG39-48	MSG41-48	MHS5-48	MSG40-48	MSG42-48	MHS6-48
50	20.0	20.8	MSG39-50	MSG41-50	MHS5-50	MSG40-50	MSG42-50	MHS6-50
56	22.4	23.2	MSG39-56	MSG41-56	MHS5-56	MSG40-56	MSG42-56	MHS6-56
60	24.0	24.8	MSG39-60	MSG41-60	MHS5-60	MSG40-60	MSG42-60	MHS6-60
64	25.6	26.4	MSG39-64	MSG41-64	MHS5-64	MSG40-64	MSG42-64	MHS6-64
72	28.8	29.6	MSG39-72	MSG41-72	MHS5-72	MSG40-72	MSG42-72	MHS6-72
80	32.0	32.8	MSG39-80	MSG41-80	MHS5-80	MSG40-80	MSG42-80	MHS6-80
96	38.4	39.2	MSG39-96	MSG41-96	MHS5-96	MSG40-96	MSG42-96	MHS6-96
104	41.6	42.4	MSG39-104	MSG41-104	MHS5-104	MSG40-104	MSG42-104	MHS6-104
112	44.8	45.6	MSG39-112	MSG41-112	MHS5-112	MSG40-112	MSG42-112	MHS6-112
120	48.0	48.8	—	MSG41-120	MHS5-120	—	MSG42-120	MHS6-120
127	50.8	51.6	—	MSG41-127	MHS5-127	—	MSG42-127	MHS6-127
144	57.6	58.4	—	MSG41-144	MHS5-144	—	MSG42-144	MHS6-144
160	64.0	64.8	—	MSG41-160	MHS5-160	—	MSG42-160	MHS6-160
176	70.4	71.2	—	MSG41-176	MHS5-176	—	MSG42-176	MHS6-176
192	76.8	77.6	—	MSG41-192	MHS5-192	—	MSG42-192	MHS6-192
224	89.6	90.4	—	MSG41-224	—	—	MSG42-224	—
240	96.0	96.8	—	MSG41-240	—	—	MSG42-240	—

**Tolerances**

Quality Number	T7 *	T6	T5
Bore	+ 0.013 - 0.000	+ 0.008 - 0.000	+ 0.005 - 0.000
Pitch Diameter	+ 0.000 - 0.025	+ 0.000 - 0.018	+ 0.000 - 0.013
Outside Diameter	+ 0.00 - 0.05	+ 0.00 - 0.04	+ 0.00 - 0.03
Total Composite and Tooth to Tooth Tolerance	Refer to Technical Reference 12-2		

\* Standard Quality Level —

No suffix on part number when ordering standard quality level. i.e. **MHS6-48**  
Specify quality level for T6 / T5 orders. i.e. **MHS6-48-T5**

†Hob Cuts Into Hub.  
Other Bore Sizes Available, Consult Factory.

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number. Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

For Gear Hubs See Pages 12-67 & 12-68



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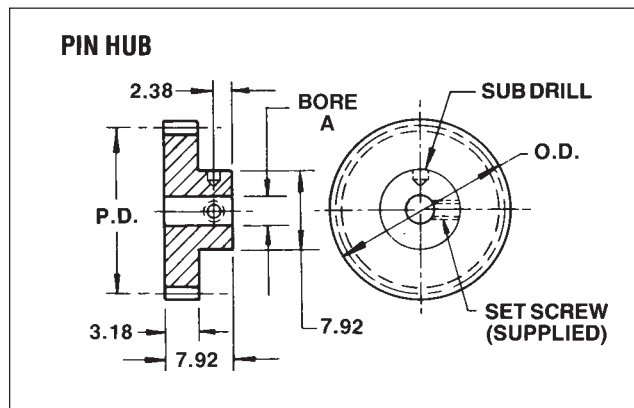


# SPUR GEARS — 0.5 Module ■ 3.18mm Face Width ■ 20° Pressure Angle

Pin Hub — 3 and 4mm Bores

All Dimensions in Millimeters

Gear Data			Stainless Steel Part No.		Aluminum Part No.	
No. Teeth	Pitch Dia.	Outside Dia.	3 mm Bore	4 mm Bore	3 mm Bore	4 mm Bore
†14	7.0	8.0	MSG15-14	MSG17-14	MSG16-14	MSG18-14
†16	8.0	9.0	MSG15-16	MSG17-16	MSG16-16	MSG18-16
†18	9.0	10.0	MSG15-18	MSG17-18	MSG16-18	MSG18-18
20	10.0	11.0	MSG15-20	MSG17-20	MSG16-20	MSG18-20
21	10.5	11.5	MSG15-21	MSG17-21	MSG16-21	MSG18-21
24	12.0	13.0	MSG15-24	MSG17-24	MSG16-24	MSG18-24
26	13.0	14.0	MSG15-26	MSG17-26	MSG16-26	MSG18-26
27	13.5	14.5	MSG15-27	MSG17-27	MSG16-27	MSG18-27
30	15.0	16.0	MSG15-30	MSG17-30	MSG16-30	MSG18-30
32	16.0	17.0	MSG15-32	MSG17-32	MSG16-32	MSG18-32
36	18.0	19.0	MSG15-36	MSG17-36	MSG16-36	MSG18-36
40	20.0	21.0	MSG15-40	MSG17-40	MSG16-40	MSG18-40
42	21.0	22.0	MSG15-42	MSG17-42	MSG16-42	MSG18-42
48	24.0	25.0	MSG15-48	MSG17-48	MSG16-48	MSG18-48
50	25.0	26.0	MSG15-50	MSG17-50	MSG16-50	MSG18-50
55	27.5	28.5	MSG15-55	MSG17-55	MSG16-55	MSG18-55
60	30.0	31.0	MSG15-60	MSG17-60	MSG16-60	MSG18-60
64	32.0	33.0	MSG15-64	MSG17-64	MSG16-64	MSG18-64
72	36.0	37.0	MSG15-72	MSG17-72	MSG16-72	MSG18-72
75	37.5	38.5	MSG15-75	MSG17-75	MSG16-75	MSG18-75
80	40.0	41.0	MSG15-80	MSG17-80	MSG16-80	MSG18-80
84	42.0	43.0	MSG15-84	MSG17-84	MSG16-84	MSG18-84
90	45.0	46.0	MSG15-90	MSG17-90	MSG16-90	MSG18-90
96	48.0	49.0	MSG15-96	MSG17-96	MSG16-96	MSG18-96
100	50.0	51.0	MSG15-100	MSG17-100	MSG16-100	MSG18-100
120	60.0	61.0	MSG15-120	MSG17-120	MSG16-120	MSG18-120
144	72.0	73.0	MSG15-144	MSG17-144	MSG16-144	MSG18-144
180	90.0	91.0	MSG15-180	MSG17-180	MSG16-180	MSG18-180



Material: 303 Stainless Steel  
2024-T4 Aluminum (Anodized Before Cutting)

Dimen.	Bore	
	3 mm	4 mm
A	2.995	3.995

†Hob Cuts Into Hub.  
Other Bore Sizes Available, Consult Factory.

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.  
Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

#### Tolerances

Quality Number	T7*	T6	T5
<b>Bore</b>	+0.013 -0.000	+0.008 -0.000	+0.005 -0.000
<b>Pitch Diameter</b>	+0.000 -0.025	+0.000 -0.018	+0.000 -0.013
<b>Outside Diameter</b>	+0.00 -0.05	+0.00 -0.04	+0.00 -0.03
<b>Total Composite and Tooth to Tooth Tolerance</b>	Refer to Technical Reference 12-2		

#### \* Standard Quality Level —

No suffix on part number when ordering standard quality level. i.e. **MSG15-60**  
Specify quality level for T6 / T5 orders. i.e. **MSG15-60-T5**

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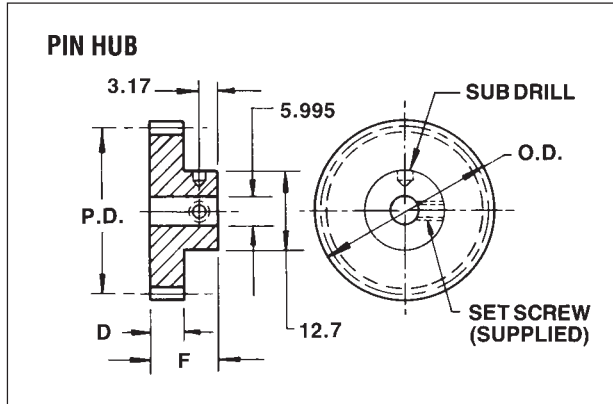
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# SPUR GEARS — 0.5 Module ■ 3.18 and 4.76mm Face Width ■ 20° Pressure Angle

## Pin Hub — 6mm Bore

All Dimensions in Millimeters



Material: 303 Stainless Steel  
2024-T4 Aluminum (Anodized Before Cutting)

Dim	Bore	
	4	6
D	3.18	4.76
F	9.52	11.10

### Tolerances

Quality Number	T7 *	T6	T5
Bore	+0.013 -0.000	+0.008 -0.000	+0.005 -0.000
Pitch Diameter	+0.000 -0.025	+0.000 -0.018	+0.000 -0.013
Outside Diameter	+0.00 -0.05	+0.00 -0.04	+0.00 -0.03
Total Composite and Tooth to Tooth Tolerance	Refer to Technical Reference 12-2		

### \* Standard Quality Level —

No suffix on part number when ordering standard quality level. i.e. **MSG19-20**  
Specify quality level for T6 / T5 orders.  
i.e. **MSG19-20-T5**

Gear Data			Stainless Steel Part No.		Aluminum Part No.	
No. Teeth	Pitch Dia.	Outside Dia.	3.18 Face Width	4.76 Face Width	3.18 Face Width	4.76 Face Width
†20	10.0	11.0	MSG19-20	MSG21-20	MSG20-20	MSG22-20
†22	11.0	12.0	MSG19-22	MSG21-22	MSG20-22	MSG22-22
†24	12.0	13.0	MSG19-24	MSG21-24	MSG20-24	MSG22-24
†26	13.0	14.0	MSG19-26	MSG21-26	MSG20-26	MSG22-26
30	15.0	16.0	MSG19-30	MSG21-30	MSG20-30	MSG22-30
32	16.0	17.0	MSG19-32	MSG21-32	MSG20-32	MSG22-32
34	17.0	18.0	MSG19-34	MSG21-34	MSG20-34	MSG22-34
36	18.0	19.0	MSG19-36	MSG21-36	MSG20-36	MSG22-36
40	20.0	21.0	MSG19-40	MSG21-40	MSG20-40	MSG22-40
42	21.0	22.0	MSG19-42	MSG21-42	MSG20-42	MSG22-42
48	24.0	25.0	MSG19-48	MSG21-48	MSG20-48	MSG22-48
50	25.0	26.0	MSG19-50	MSG21-50	MSG20-50	MSG22-50
55	27.5	28.5	MSG19-55	MSG21-55	MSG20-55	MSG22-55
60	30.0	31.0	MSG19-60	MSG21-60	MSG20-60	MSG22-60
72	36.0	37.0	MSG19-72	MSG21-72	MSG20-72	MSG22-72
75	37.5	38.5	MSG19-75	MSG21-75	MSG20-75	MSG22-75
80	40.0	41.0	MSG19-80	MSG21-80	MSG20-80	MSG22-80
84	42.0	43.0	MSG19-84	MSG21-84	MSG20-84	MSG22-84
90	45.0	46.0	MSG19-90	MSG21-90	MSG20-90	MSG22-90
96	48.0	49.0	MSG19-96	MSG21-96	MSG20-96	MSG22-96
100	50.0	51.0	MSG19-100	MSG21-100	MSG20-100	MSG22-100
105	52.5	53.5	MSG19-105	MSG21-105	MSG20-105	MSG22-105
110	55.0	56.0	MSG19-110	MSG21-110	MSG20-110	MSG22-110
120	60.0	61.0	MSG19-120	MSG21-120	MSG20-120	MSG22-120
126	63.0	64.0	MSG19-126	MSG21-126	MSG20-126	MSG22-126
144	72.0	73.0	MSG19-144	MSG21-144	MSG20-144	MSG22-144
156	78.0	79.0	MSG19-156	MSG21-156	MSG20-156	MSG22-156
180	90.0	91.0	MSG19-180	MSG21-180	MSG20-180	MSG22-180

†Hob Cuts Into Hub.

Other Bore Sizes Available, Consult Factory.

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number. Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

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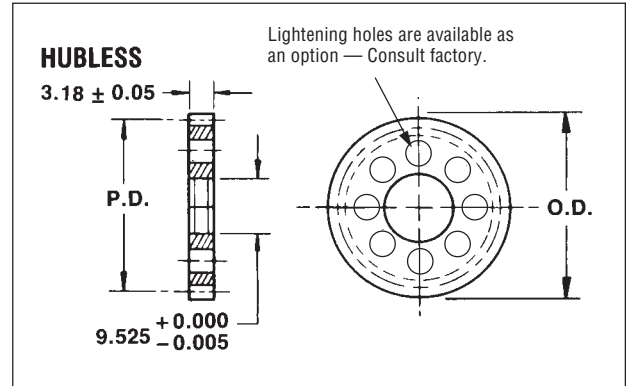
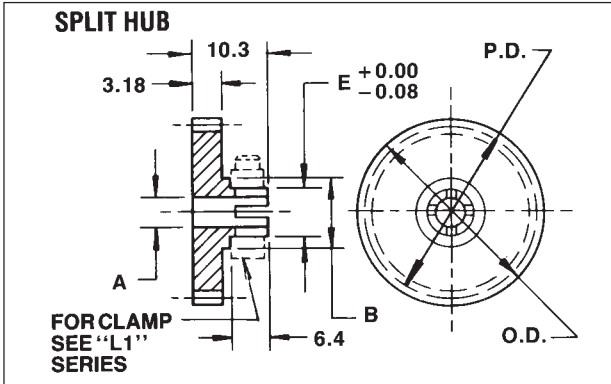
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# SPUR GEARS — 0.5 Module ■ 3.18mm Face Width ■ 20° Pressure Angle

Split Hub — 4 and 6mm Bores ■ Hubless — 9.52mm Bore

All Dimensions in Millimeters



Material: 303 Stainless Steel  
2024-T4 Aluminum (Anodized Before Cutting)

Gear Data			Stainless Steel Part No.			Aluminum Part No.		
			Split Hub		Hubless	Split Hub		Hubless
No. Teeth	Pitch Dia.	Outside Dia.	4 mm Bore	6 mm Bore	9.525 mm Bore	4 mm Bore	6 mm Bore	9.525 mm Bore
†20	10.0	11.0	MSG43-20	MSG45-20	—	MSG44-20	MSG46-20	—
†21	10.5	11.5	MSG43-21	MSG45-21	—	MSG44-21	MSG46-21	—
22	11.0	12.0	MSG43-22	MSG45-22	—	MSG44-22	MSG46-22	—
23	11.5	12.5	MSG43-23	MSG45-23	—	MSG44-23	MSG46-23	—
24	12.0	13.0	MSG43-24	MSG45-24	—	MSG44-24	MSG46-24	—
25	12.5	13.5	MSG43-25	MSG45-25	—	MSG44-25	MSG46-25	—
27	13.5	14.5	MSG43-27	MSG45-27	—	MSG44-27	MSG46-27	—
30	15.0	16.0	MSG43-30	MSG45-30	MHS7-30	MSG44-30	MSG46-30	MHS8-30
32	16.0	17.0	MSG43-32	MSG45-32	MHS7-32	MSG44-32	MSG46-32	MHS8-32
36	18.0	19.0	MSG43-36	MSG45-36	MHS7-36	MSG44-36	MSG46-36	MHS8-36
40	20.0	21.0	MSG43-40	MSG45-40	MHS7-40	MSG44-40	MSG46-40	MHS8-40
42	21.0	22.0	MSG43-42	MSG45-42	MHS7-42	MSG44-42	MSG46-42	MHS8-42
44	22.0	23.0	MSG43-44	MSG45-44	MHS7-44	MSG44-44	MSG46-44	MHS8-44
48	24.0	25.0	MSG43-48	MSG45-48	MHS7-48	MSG44-48	MSG46-48	MHS8-48
55	27.5	28.5	MSG43-55	MSG45-55	MHS7-55	MSG44-55	MSG46-55	MHS8-55
60	30.0	31.0	MSG43-60	MSG45-60	MHS7-60	MSG44-60	MSG46-60	MHS8-60
72	36.0	37.0	MSG43-72	MSG45-72	MHS7-72	MSG44-72	MSG46-72	MHS8-72
78	39.0	40.0	MSG43-78	MSG45-78	MHS7-78	MSG44-78	MSG46-78	MHS8-78
84	42.0	43.0	MSG43-84	MSG45-84	MHS7-84	MSG44-84	MSG46-84	MHS8-84
90	45.0	46.0	MSG43-90	MSG45-90	MHS7-90	MSG44-90	MSG46-90	MHS8-90
96	48.0	49.0	—	MSG45-96	MHS7-96	—	MSG46-96	MHS8-96
108	54.0	55.0	—	MSG45-108	MHS7-108	—	MSG46-108	MHS8-108
120	60.0	61.0	—	MSG45-120	MHS7-120	—	MSG46-120	MHS8-120
127	63.5	64.5	—	MSG45-127	MHS7-127	—	MSG46-127	MHS8-127
132	66.0	67.0	—	MSG45-132	MHS7-132	—	MSG46-132	MHS8-132
168	84.0	85.0	—	MSG45-168	MHS7-168	—	MSG46-168	MHS8-168
192	96.0	97.0	—	MSG45-192	MHS7-192	—	MSG46-192	MHS8-192

†Hob Cuts Into Hub.

Other Bore Sizes Available, Consult Factory.

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

For Gear Hubs See Pages 12-67 & 12-68

Dim	Bore	
	4	6
A	3.995	5.995
B	7.92	9.52
C	6.4	7.92

### Tolerances

Quality Number	T7*	T6	T5
Bore	+ 0.013	+ 0.008	+ 0.005
	- 0.000	- 0.000	- 0.000
Pitch Diameter	+ 0.000	+ 0.000	+ 0.000
	- 0.025	- 0.018	- 0.013
Outside Diameter	+ 0.00	+ 0.00	+ 0.00
	- 0.05	- 0.04	- 0.03
Total Composite and Tooth to Tooth Tolerance	Refer to Technical Reference 12-2		

\* Standard Quality Level —

No suffix on part number when ordering standard quality level. i.e. **MSG43-20**

Specify quality level for T6 / T5 orders. i.e. **MSG43-20-T5**

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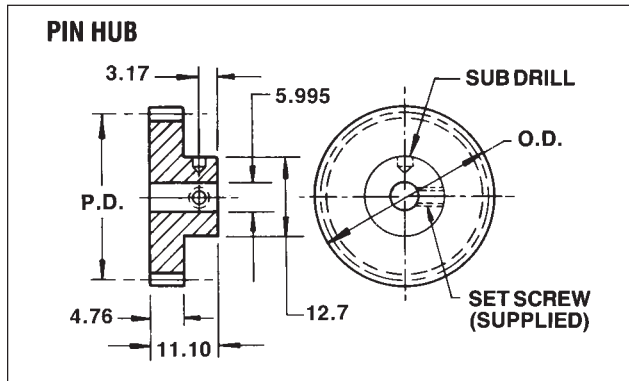
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# SPUR GEARS — 0.6 Module ■ 4.76mm Face Width ■ 20° Pressure Angle

Pin Hub — 6mm Bore

All Dimensions in Millimeters



Material: 303 Stainless Steel  
2024-T4 Aluminum (Anodized Before Cutting)

### Tolerances

Quality Number	T7 *	T6	T5
<b>Bore</b>	+ 0.013 - 0.000	+ 0.008 - 0.000	+ 0.005 - 0.000
<b>Pitch Diameter</b>	+ 0.000 - 0.025	+ 0.000 - 0.018	+ 0.000 - 0.013
<b>Outside Diameter</b>	+ 0.00 - 0.05	+ 0.00 - 0.04	+ 0.00 - 0.03
<b>Total Composite and Tooth to Tooth Tolerance</b>	Refer to Technical Reference 12-2		

### \* Standard Quality Level —

No suffix on part number when ordering standard quality level. i.e. **MSG23-16**

Specify quality level for T6 / T5 orders.

i.e. **MSG23-16-T5**

Gear Data			Stainless Steel Part No.	Aluminum Part No.
No. Teeth	Pitch Dia.	Outside Dia.		
†16	9.6	10.8	MSG23-16	MSG24-16
†18	10.8	12.0	MSG23-18	MSG24-18
†20	12.0	13.2	MSG23-20	MSG24-20
†22	13.2	14.4	MSG23-22	MSG24-22
24	14.4	15.6	MSG23-24	MSG24-24
28	16.8	18.0	MSG23-28	MSG24-28
30	18.0	19.2	MSG23-30	MSG24-30
32	19.2	20.4	MSG23-32	MSG24-32
34	20.4	21.6	MSG23-34	MSG24-34
40	24.0	25.2	MSG23-40	MSG24-40
44	26.4	27.6	MSG23-44	MSG24-44
48	28.8	30.0	MSG23-48	MSG24-48
50	30.0	31.2	MSG23-50	MSG24-50
56	33.6	34.8	MSG23-56	MSG24-56
60	36.0	37.2	MSG23-60	MSG24-60
64	38.4	39.6	MSG23-64	MSG24-64
72	43.2	44.4	MSG23-72	MSG24-72
80	48.0	49.2	MSG23-80	MSG24-80
84	50.4	51.6	MSG23-84	MSG24-84
88	52.8	54.0	MSG23-88	MSG24-88
96	57.6	58.8	MSG23-96	MSG24-96
100	60.0	61.2	MSG23-100	MSG24-100
112	67.2	68.4	MSG23-112	MSG24-112
120	72.0	73.2	MSG23-120	MSG24-120

†Hob Cuts Into Hub.

Other Bore Sizes Available, Consult Factory.

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

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# SPUR GEARS — 0.7 Module ■ 4.76mm Face Width ■ 20° Pressure Angle

Pin Hub — 6mm Bore

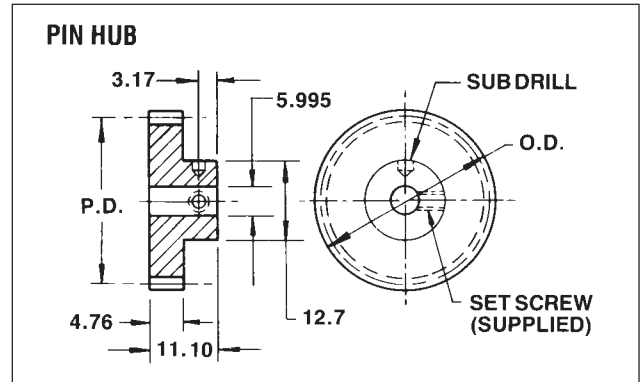
Gear Data			Stainless Steel Part No.	Aluminum Part No.
No. Teeth	Pitch Dia.	Outside Dia.		
†16	11.2	12.6	MSG25-16	MSG26-16
†18	12.6	14.0	MSG25-18	MSG26-18
†20	14.0	15.4	MSG25-20	MSG26-20
22	15.4	16.8	MSG25-22	MSG26-22
24	16.8	18.2	MSG25-24	MSG26-24
28	19.6	21.0	MSG25-28	MSG26-28
30	21.0	22.4	MSG25-30	MSG26-30
32	22.4	23.8	MSG25-32	MSG26-32
34	23.8	25.2	MSG25-34	MSG26-34
40	28.0	29.4	MSG25-40	MSG26-40
44	30.8	32.2	MSG25-44	MSG26-44
48	33.6	35.0	MSG25-48	MSG26-48
50	35.0	36.4	MSG25-50	MSG26-50
56	39.2	40.6	MSG25-56	MSG26-56
60	42.0	43.4	MSG25-60	MSG26-60
64	44.8	46.2	MSG25-64	MSG26-64
72	50.4	51.8	MSG25-72	MSG26-72
80	56.0	57.4	MSG25-80	MSG26-80
84	58.8	60.2	MSG25-84	MSG26-84
88	61.6	63.0	MSG25-88	MSG26-88
96	67.2	68.6	MSG25-96	MSG26-96
100	70.0	71.4	MSG25-100	MSG26-100
112	78.4	79.8	MSG25-112	MSG26-112
120	84.0	85.4	MSG25-120	MSG26-120

†Hob Cuts Into Hub.

Other Bore Sizes Available, Consult Factory.

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.



Material: 303 Stainless Steel  
2024-T4 Aluminum (Anodized Before Cutting)

#### Tolerances

Quality Number	T7 *	T6	T5
<b>Bore</b>	+0.013 -0.000	+0.008 -0.000	+0.005 -0.000
<b>Pitch Diameter</b>	+0.000 -0.025	+0.000 -0.018	+0.000 -0.013
<b>Outside Diameter</b>	+0.00 -0.05	+0.00 -0.04	+0.00 -0.03
<b>Total Composite and Tooth to Tooth Tolerance</b>	Refer to Technical Reference 12-2		

#### \* Standard Quality Level —

No suffix on part number when ordering standard quality level. i.e. **MSG25-16**

Specify quality level for T6 / T5 orders. i.e. **MSG25-16-T5**

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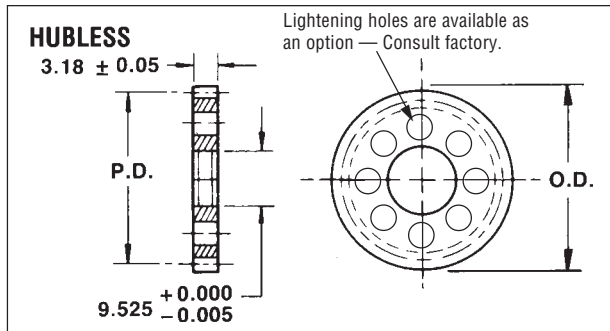
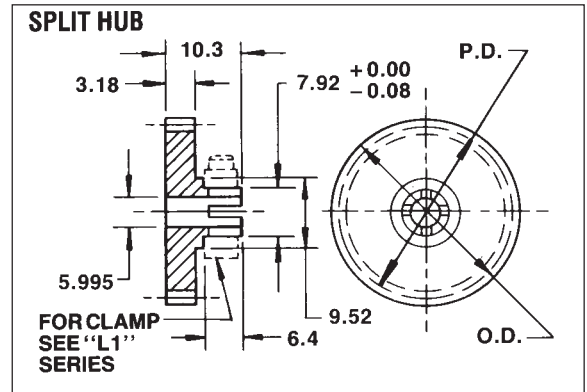
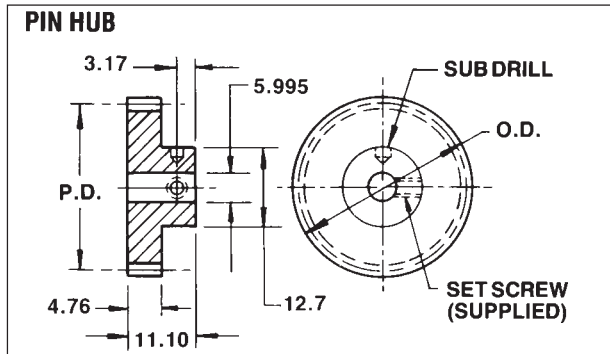
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# SPUR GEARS — 0.8 Module ■ 3.18 and 4.76mm Face Width ■ 20° Pressure Angle

Pin Hub — 6mm Bore ■ Split Hub — 6mm Bore ■ Hubless — 9.52mm Bore

All Dimensions in Millimeters



Material: 303 Stainless Steel  
2024-T4 Aluminum (Anodized Before Cutting)

For Gear Hubs See Pages 12-67 & 12-68

## Tolerances

Quality Number	T7 *	T6	T5
Bore	+ 0.013 - 0.000	+ 0.008 - 0.000	+ 0.005 - 0.000
Pitch Diameter	+ 0.000 - 0.025	+ 0.000 - 0.018	+ 0.000 - 0.013
Outside Diameter	+ 0.00 - 0.05	+ 0.00 - 0.04	+ 0.00 - 0.03
Total Composite and Tooth to Tooth Tolerance	Refer to Technical Reference 12-2		

### \* Standard Quality Level —

No suffix on part number when ordering standard quality level. i.e. **MSG27-22**  
Specify quality level for T6 / T5 orders. i.e. **MSG27-22-T5**

Gear Data			Stainless Steel Part No.			Aluminum Part No.		
No. Teeth	Pitch Dia.	Outside Dia.	Pin Hub	Split Hub	Hubless	Pin Hub	Split Hub	Hubless
22	17.6	19.2	MSG27-22	—	—	MSG28-22	—	—
24	19.2	20.8	MSG27-24	—	—	MSG28-24	—	—
26	20.8	22.4	MSG27-26	—	—	MSG28-26	—	—
28	22.4	24.0	MSG27-28	—	—	MSG28-28	—	—
30	24.0	25.6	MSG27-30	MSG47-30	MHS9-30	MSG28-30	MSG48-30	MHS10-30
32	25.6	27.2	MSG27-32	MSG47-32	MHS9-32	MSG28-32	MSG48-32	MHS10-32
34	27.2	28.8	MSG27-34	MSG47-34	MHS9-34	MSG28-34	MSG48-34	MHS10-34
36	28.8	30.4	MSG27-36	MSG47-36	MHS9-36	MSG28-36	MSG48-36	MHS10-36
38	30.4	32.0	MSG27-38	MSG47-38	MHS9-38	MSG28-38	MSG48-38	MHS10-38
40	32.0	33.6	MSG27-40	MSG47-40	MHS9-40	MSG28-40	MSG48-40	MHS10-40
44	35.2	36.8	MSG27-44	MSG47-44	MHS9-44	MSG28-44	MSG48-44	MHS10-44
48	38.4	40.0	MSG27-48	MSG47-48	MHS9-48	MSG28-48	MSG48-48	MHS10-48
56	44.8	46.4	MSG27-56	MSG47-56	MHS9-56	MSG28-56	MSG48-56	MHS10-56
60	48.0	49.6	MSG27-60	MSG47-60	MHS9-60	MSG28-60	MSG48-60	MHS10-60
64	51.2	52.8	MSG27-64	MSG47-64	MHS9-64	MSG28-64	MSG48-64	MHS10-64
68	54.4	56.0	MSG27-68	MSG47-68	MHS9-68	MSG28-68	MSG48-68	MHS10-68
72	57.6	59.2	MSG27-72	MSG47-72	MHS9-72	MSG28-72	MSG48-72	MHS10-72
80	64.0	65.6	MSG27-80	MSG47-80	MHS9-80	MSG28-80	MSG48-80	MHS10-80
88	70.4	72.0	MSG27-88	MSG47-88	MHS9-88	MSG28-88	MSG48-88	MHS10-88
96	76.8	78.4	MSG27-96	MSG47-96	MHS9-96	MSG28-96	MSG48-96	MHS10-96
108	86.4	88.0	MSG27-108	MSG47-108	MHS9-108	MSG28-108	MSG48-108	MHS10-108
112	89.6	91.2	MSG27-112	MSG47-112	MHS9-112	MSG28-112	MSG48-112	MHS10-112
128	102.4	104.0	MSG27-128	MSG47-128	MHS9-128	MSG28-128	MSG48-128	MHS10-128
132	105.6	107.2	MSG27-132	MSG47-132	MHS9-132	MSG28-132	MSG48-132	MHS10-132

Other Bore Sizes Available, Consult Factory.

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

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# SPUR GEARS — 0.8 Module ■ 9.52 Face Width ■ 20° Pressure Angle

DIN Quality 7 ■ Pin Hub — 10mm Bore

All Dimensions in Millimeters

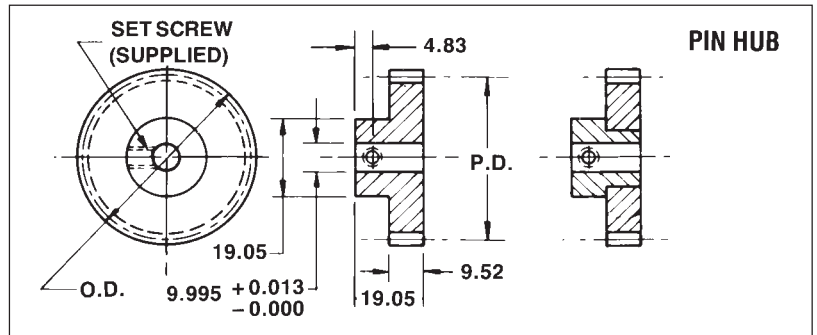
Gear Data			Stainless Steel Part No.	Bronze Part No.
No. Teeth	Pitch Dia.	Outside Dia.		
†20	16.0	17.6	MSG29-20	MSG30-20
†24	19.2	20.8	MSG29-24	MSG30-24
28	22.4	24.0	MSG29-28	MSG30-28
30	24.0	25.6	MSG29-30	MSG30-30
32	25.6	27.2	MSG29-32	MSG30-32
36	28.8	30.4	MSG29-36	MSG30-36
40	32.0	33.6	MSG29-40	MSG30-40
48	38.4	40.0	MSG29-48	MSG30-48
56	44.8	46.4	MSG29-56	MSG30-56
60	48.0	49.6	MSG29-60	MSG30-60
64	51.2	52.8	MSG29-64	MSG30-64
72	57.6	59.2	MSG29-72	MSG30-72
80	64.0	65.6	MSG29-80	MSG30-80
96	76.8	78.4	MSG29-96	MSG30-96
112	89.6	91.2	MSG29-112	MSG30-112
128	102.4	104.0	MSG29-128	MSG30-128
144	115.2	116.8	MSG29-144	MSG30-144
160	128.0	129.6	MSG29-160	MSG30-160

†Hob Cuts Into Hub.

Other Bore Sizes Available, Consult Factory.

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.



Material: 303 Stainless Steel or Bronze Alloy

Tolerances	Tooth-to-Tooth Composite	Total Composite
Up to 20 Teeth Inclusive	0.018	0.025
Over 20 Teeth — up to 50 Pitch Dia.	0.013	0.025
Over 20 Teeth — 50.1 to 100 Pitch Dia.	0.013	0.030
Over 20 Teeth — 100.1 and Over	0.013	0.035

When ordering, Specify Part Number

Example: MSG29-30

# SPUR GEARS — 1.0 Module ■ 9.52 Face Width ■ 20° Pressure Angle

DIN Quality 7 ■ Pin Hub — 10mm Bore

All Dimensions in Millimeters

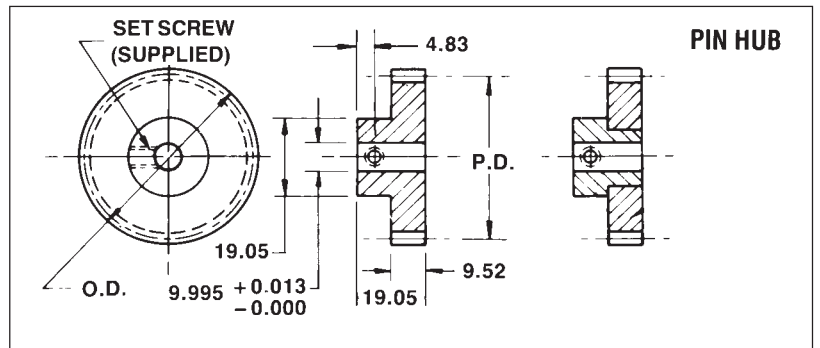
Gear Data			Stainless Steel Part No.	Bronze Part No.
No. Teeth	Pitch Dia.	Outside Dia.		
†15	15.0	17.0	MSG33-15	MSG34-15
†16	16.0	18.0	MSG33-16	MSG34-16
†18	18.0	20.0	MSG33-18	MSG34-18
†20	20.0	22.0	MSG33-20	MSG34-20
24	24.0	26.0	MSG33-24	MSG34-24
28	28.0	30.0	MSG33-28	MSG34-28
30	30.0	32.0	MSG33-30	MSG34-30
36	36.0	38.0	MSG33-36	MSG34-36
40	40.0	42.0	MSG33-40	MSG34-40
48	48.0	50.0	MSG33-48	MSG34-48
56	56.0	58.0	MSG33-56	MSG34-56
60	60.0	62.0	MSG33-60	MSG34-60
72	72.0	74.0	MSG33-72	MSG34-72
80	80.0	82.0	MSG33-80	MSG34-80
96	96.0	98.0	MSG33-96	MSG34-96
112	112.0	114.0	MSG33-112	MSG34-112
120	120.0	122.0	MSG33-120	MSG34-120

†Hob Cuts Into Hub.

Other Bore Sizes Available, Consult Factory.

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.



Material: 303 Stainless Steel

Tolerances	Tooth-to-Tooth Composite	Total Composite
Up to 20 Teeth Inclusive	0.018	0.025
Over 20 Teeth — up to 50 Pitch Dia.	0.013	0.025
Over 20 Teeth — 50.1 to 100 Pitch Dia.	0.013	0.030
Over 20 Teeth — 100.1 and Over	0.013	0.035

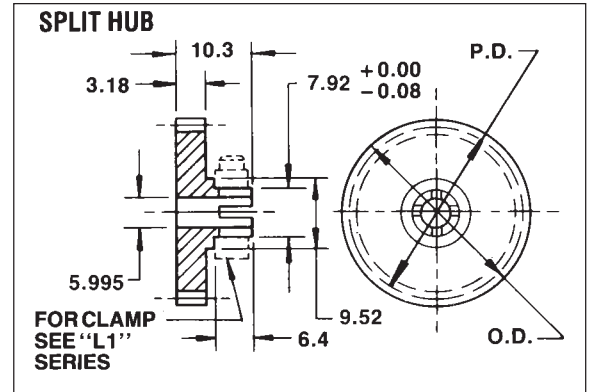
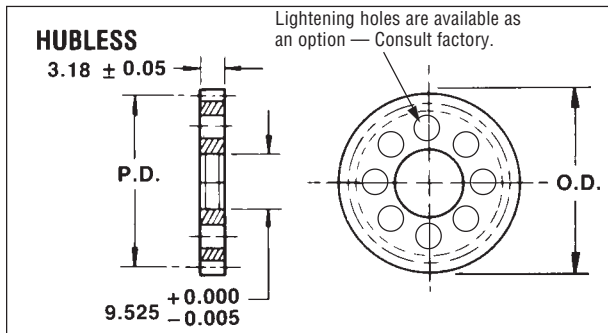
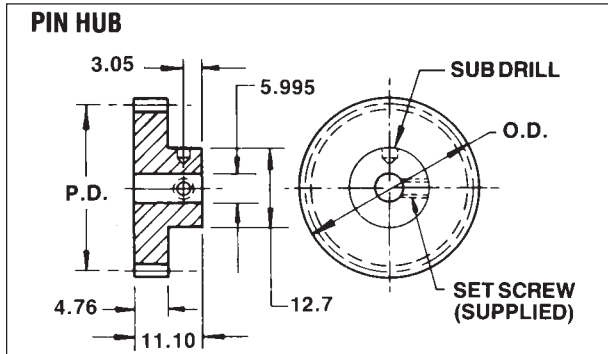
When ordering, Specify Part Number

Example: MSG33-30

# SPUR GEARS — 1.0 Module ■ 3.18 and 4.76mm Face Width ■ 20° Pressure Angle

Pin Hub — 6mm Bore ■ Split Hub — 6mm Bore ■ Hubless — 9.52mm Bore

All Dimensions in Millimeters



Material: 303 Stainless Steel  
2024-T4 Aluminum (Anodized Before Cutting)

For Gear Hubs See Pages 12-67 & 12-68

## Tolerances

Quality Number	T7	T6	T5
Bore	+0.013 -0.000	+0.008 -0.000	+0.005 -0.000
Pitch Diameter	+0.000 -0.025	+0.000 -0.018	+0.000 -0.013
Outside Diameter	+0.00 -0.05	+0.00 -0.04	+0.00 -0.03
Total Composite and Tooth to Tooth Tolerance	Refer to Technical Reference 12-2		

When ordering, Specify Part Number and Quantity Number.  
EXAMPLE: MSG31-30-T7

To order DIN Quality 5, 6, or 7, add -T5, -T6 or -T7, respectively to part number.

Gear Data			Stainless Steel Part No.			Aluminum Part No.		
No. Teeth	Pitch Dia.	Outside Dia.	Pin Hub	Split Hub	Hubless	Pin Hub	Split Hub	Hubless
†10	10.0	12.0	MSG31-10	—	—	MSG32-10	—	—
†12	12.0	14.0	MSG31-12	—	—	MSG32-12	—	—
†15	15.0	17.0	MSG31-15	—	—	MSG32-15	—	—
16	16.0	18.0	MSG31-16	—	—	MSG32-16	—	—
18	18.0	20.0	MSG31-18	MSG49-18	MHS11-18	MSG32-18	MSG50-18	MHS12-18
20	20.0	22.0	MSG31-20	MSG49-20	MHS11-20	MSG32-20	MSG50-20	MHS12-20
21	21.0	23.0	MSG31-21	MSG49-21	MHS11-21	MSG32-21	MSG50-21	MHS12-21
24	24.0	26.0	MSG31-24	MSG49-24	MHS11-24	MSG32-24	MSG50-24	MHS12-24
27	27.0	29.0	MSG31-27	MSG49-27	MHS11-27	MSG32-27	MSG50-27	MHS12-27
30	30.0	32.0	MSG31-30	MSG49-30	MHS11-30	MSG32-30	MSG50-30	MHS12-30
36	36.0	38.0	MSG31-36	MSG49-36	MHS11-36	MSG32-36	MSG50-36	MHS12-36
39	39.0	41.0	MSG31-39	MSG49-39	MHS11-39	MSG32-39	MSG50-39	MHS12-39
42	42.0	44.0	MSG31-42	MSG49-42	MHS11-42	MSG32-42	MSG50-42	MHS12-42
48	48.0	50.0	MSG31-48	MSG49-48	MHS11-48	MSG32-48	MSG50-48	MHS12-48
51	51.0	53.0	MSG31-51	MSG49-51	MHS11-51	MSG32-51	MSG50-51	MHS12-51
60	60.0	62.0	MSG31-60	MSG49-60	MHS11-60	MSG32-60	MSG50-60	MHS12-60
72	72.0	74.0	MSG31-72	MSG49-72	MHS11-72	MSG32-72	MSG50-72	MHS12-72
75	75.0	77.0	MSG31-75	MSG49-75	MHS11-75	MSG32-75	MSG50-75	MHS12-75
81	81.0	83.0	MSG31-81	MSG49-81	MHS11-81	MSG32-81	MSG50-81	MHS12-81
84	84.0	86.0	MSG31-84	MSG49-84	MHS11-84	MSG32-84	MSG50-84	MHS12-84
87	87.0	89.0	MSG31-87	MSG49-87	MHS11-87	MSG32-87	MSG50-87	MHS12-87
96	96.0	98.0	MSG31-96	MSG49-96	MHS11-96	MSG32-96	MSG50-96	MHS12-96
99	99.0	101.0	MSG31-99	MSG49-99	MHS11-99	MSG32-99	MSG50-99	MHS12-99
100	100.0	102.0	MSG31-100	MSG49-100	MHS11-100	MSG32-100	MSG50-100	MHS12-100

†Hob Cuts Into Hub.

Other Bore Sizes Available, Consult Factory.

For gears with a number of teeth not shown within the range listed above, substitute the required number of teeth for the digits at the end of the Part Number.

Pricing can be determined by using our online E-Commerce price list for the next higher published part number in the listing.

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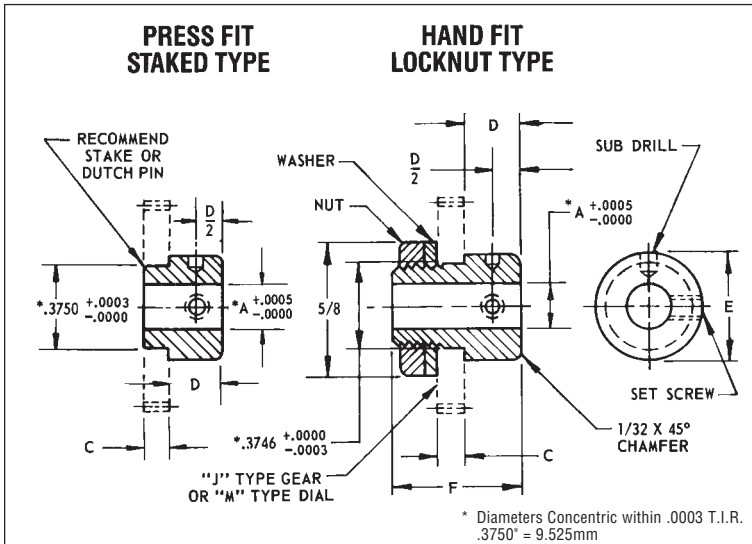
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# GEAR & DIAL HUB-PIN TYPE — 1/8", 3/16" and 1/4" = 3, 4 & 6mm Bores



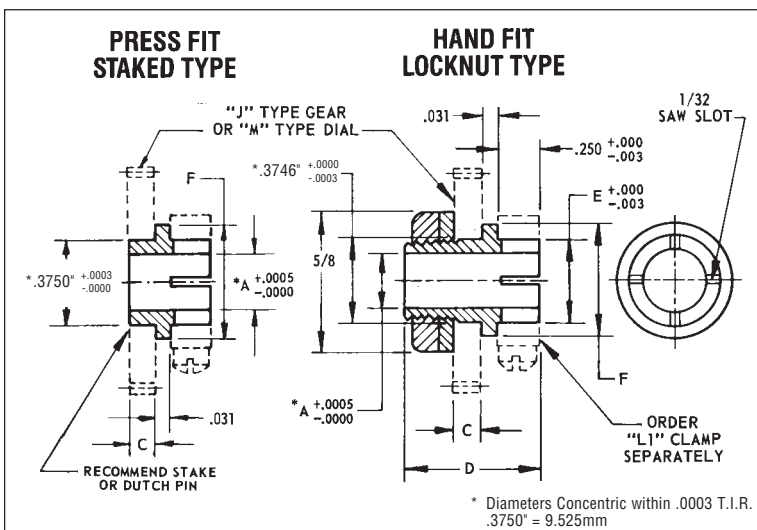
Material: 303 Stainless Steel

Hub Data					Sub Drill	Set Screw	Hand Fit Part No.	Press Fit Part No.
A	C	D	E	F				
.1200	.125	.22	7/16	—	#69	#2-56	—	K1-8
.1248	.062 .125	.22	7/16	.53 .60	#69	#2-56	K1-9 K1-10	K1-1 K1-2
.1873	.062 .125	.22	7/16	.53 .60	#60	#4-40	K1-11 K1-12	K1-3 K1-4
.2498	.062 .125	.25	1/2	.53 .60	#50	#6-32	K1-13 K1-14	K1-5 K1-6

Dimensions Are In Millimeters.

Hub Data					Sub Drill	Set Screw	Hand Fit Part No.	Press Fit Part No.
A	C	D	E	F				
2.995	1.6	5.6	11.1	13.5	0.75	M2X0.4	MHU7-1	MHU6-1
2.995	3.2	5.6	11.1	15.2	0.75	M2X0.4	MHU7-2	MHU6-2
3.995	1.6	5.6	11.1	13.5	0.75	M2X0.4	MHU7-3	MHU6-3
3.995	3.2	5.6	11.1	15.2	0.75	M2X0.4	MHU7-4	MHU6-4
5.995	1.6	6.35	12.7	13.5	1.80	M3X0.5	MHU7-5	MHU6-5
5.995	3.2	6.35	12.7	15.2	1.80	M3X0.5	MHU7-6	MHU6-6

# GEAR & DIAL HUB-SPLIT TYPE — 1/8", 3/16" and 1/4" = 3, 4 & 6mm Bores



Material: 303 Stainless Steel

Hub Data					Hand Fit Part No.	Press Fit Part No.
A	C	D	E	F		
.1200	.125	.60	.188	7/16	—	K2-8
.1248	.062 .125	.53 .60	.188	7/16	K2-9 K2-10	K2-1 K2-2
.1873	.062 .125	.53 .60	.250	7/16	K2-11 K2-12	K2-3 K2-4
.2498	.062 .125	.53 .60	.312	1/2	K2-13 K2-14	K2-5 K2-6

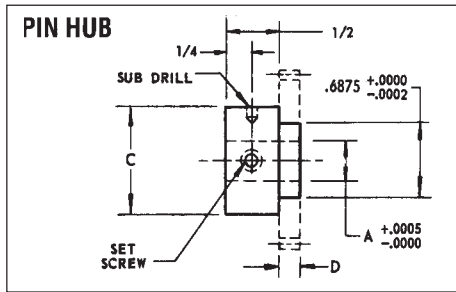
Dimensions Below Are In Millimeters

Hub Data					Hand Fit Part No.	Press Fit Part No.
A	C	D	E	F		
2.995	1.6	13.5	4.78	11.1	MHU9-1	MHU8-1
2.995	3.2	15.2	4.78	11.1	MHU9-2	MHU8-2
3.995	1.6	13.5	6.35	11.1	MHU9-3	MHU8-3
3.995	3.2	15.2	6.35	11.1	MHU9-4	MHU8-4
5.995	1.6	13.5	7.92	12.7	MHU9-5	MHU8-5
5.995	3.2	15.2	7.92	12.7	MHU9-6	MHU8-6

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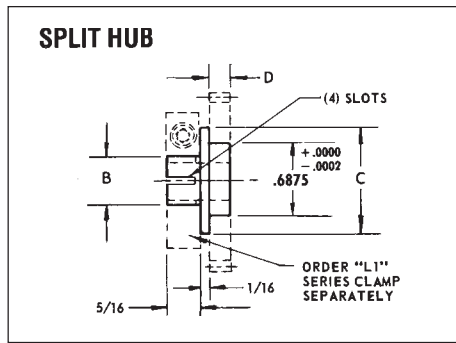
# GEAR HUBS — 5/16", 3/8" and 1/2" ■ 8, 10 & 12mm Bores



Material: 303 Stainless Steel

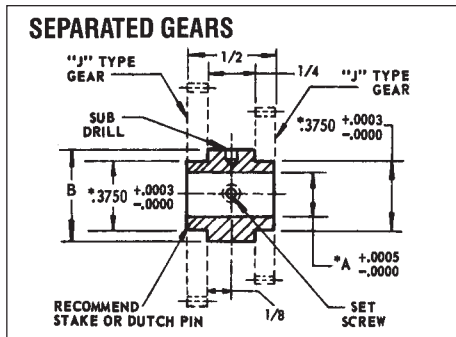
Shaft Size	Hub Data				Split Hub	Pin Hub	
	A	B	C	D	Part No.	Set Screw	Part No.
5/16	.3123	.375	.875	3/16 1/8	K2-50 K2-50A	# 6-32	K1-50 K1-50A
3/8	.3748	.437	1.000	3/16 1/8	K2-51 K2-51A	# 8-32	K1-51 K1-51A
1/2	.4998	.562	1.250	3/16 1/8	K2-52 K2-52A	#10-32	K1-52 K1-52A

Dimensions Below Are In Millimeters.



Shaft Size	Hub Data				Split Hub	Pin Hub	
	A	B	C	D	Part No.	Set Screw	Part No.
8	7.995	9.52	22.22	4.76 3.18	MHU2-1 MHU2-2	M4X0.7	MHU1-1 MHU1-2
10	9.995	11.11	25.4	4.76 3.18	MHU3-3 MHU3-4	M5X0.8	MHU1-3 MHU1-4
12	11.995	14.29	31.75	4.76 3.18	MHU4-5 MHU4-6	M6X1	MHU1-5 MHU1-6

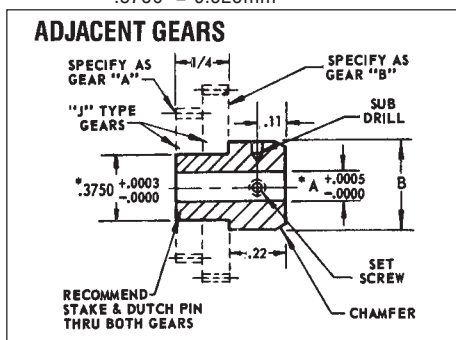
# GEAR HUBS-CLUSTER — 1/8", 3/16" and 1/4" ■ 3, 4 & 6mm Bores



Material: 303 Stainless Steel

\* Diameters Concentric within .0003 T.I.R.  
.3750" = 9.525mm

Shaft Size	Hub Data				Adjacent Part No.	Separated Part No.
	A	B	Sub Drill	Set Screw		
1/8	.1248	7/16	#69	#2-56	BH-7	BH-4
3/16	.1873	7/16	#60	#4-40	BH-8	BH-5
1/4	.2498	1/2	#50	#6-32	BH-9	BH-6



Dimensions Below Are In Millimeters.

Shaft Size	Hub Data				Adjacent Part No.	Separated Part No.
	A	B	Sub Drill	Set Screw		
3	2.995	11.11	69	M2X0.4 6H	MHU5-4	MHU5-1
4	3.995	11.11	69	M2X0.4 6H	MHU5-5	MHU5-2
6	5.995	12.7	50	M3X0.5 6H	MHU5-6	MHU5-3

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