

<b>Bending Moment</b>	in-lbs	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275	
<b>Torsional</b>	in-lbs	186.078079872	186	186	186	186	186	186	186	186	186	186	186	186	186	186	186	186	186	186	186
<b>Safety Factor</b>		0.34	1	2	3	4	5	1.5	1.6	1.7	1.8	1.9	2	2.1	2.2	2.3	2.4	2.5	2.6	2.7	
<b>S(ult)</b>	psi	74,700	74,700	74,700	74,700	74,700	74,700	74,700	74,700	74,700	74,700	74,700	74,700	74,700	74,700	74,700	74,700	74,700	74,700	74,700	74,700
<b>Kbending</b>		2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
<b>Ktorsion</b>		3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
<b>Diameter:</b>	inches	0.330	0.473	0.595	0.682	0.750	0.808	0.541	0.553	0.564	0.575	0.585	0.595	0.605	0.615	0.624	0.633	0.641	0.650	0.658	
					0.625																

Bearings for 5/8th diam <http://www.mcmaster.com/#6384k365/=rjt>

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$$d = \left( \frac{16n}{\pi} \left\{ \frac{1}{S_e} [4(K_f M_a)^2 + 3(K_{fs} T_a)^2]^{1/2} + \frac{1}{S_{ut}} [4(K_f M_m)^2 + 3(K_{fs} T_m)^2]^{1/2} \right\} \right)^{1/3}$$

	Current 3 Motor	4 motor	48 GR 3 motor
Torque Motor	0.02	0.02	0.02
First Gear Ratio	4	4	4
Second Gear Ratio	7	7	12
Torque on Drive Shaft	1.68	2.24	2.88
Inertial Modifier	147	196	432
	Torque increase	0.33	0.71
	Input RPM decrease	0.25	0.42

P	33.8323781585454	Force at Pedal		Max P	100
l	5.5	length of the crank arm			
r1	1.5	96 tooth [in]			
r2	0.375	24 tooth [in]			
r3	0.75	56 tooth [in]			
rm	0.125	8 tooth [in]			
Tm	2.584417776	stall torque of motor [in-lb]			
Mz	186.078079872	reactionary torsional force on shaft [in-lb]			
Mz	15.506506656	[ft-lb]			
Testing for the Motor torque					
P	5	Input			
Mz	2.29166666666667	ft-lb			
Tm	0.031828703703704	ft-lb			