

## Backlash Comparison – ArcMinute vs Linear Distance

ArcMinute	Degrees	Linear Distance in Inches			
		@ 3" R	@ 12" R	@ 24" R	@ 48" R
1	0.017	0.0009	0.0035	0.0070	0.0140
2	0.033	0.0017	0.0070	0.0140	0.0279
3	0.050	0.0026	0.0105	0.0209	0.0419
4	0.067	0.0035	0.0140	0.0279	0.0558
5	0.083	0.0044	0.0175	0.0349	0.0698
6	0.100	0.0052	0.0209	0.0419	0.0838
7	0.117	0.0061	0.0244	0.0489	0.0977
8	0.133	0.0070	0.0279	0.0558	0.1117
9	0.150	0.0079	0.0314	0.0628	0.1257
10	0.167	0.0087	0.0349	0.0698	0.1396
11	0.183	0.0096	0.0384	0.0768	0.1536
12	0.200	0.0105	0.0419	0.0838	0.1675
13	0.217	0.0113	0.0454	0.0908	0.1815
14	0.233	0.0122	0.0489	0.0977	0.1955
15	0.250	0.0131	0.0524	0.1047	0.2094
16	0.267	0.0140	0.0558	0.1117	0.2234
17	0.283	0.0148	0.0593	0.1187	0.2373
18	0.300	0.0157	0.0628	0.1257	0.2513
19	0.317	0.0166	0.0663	0.1326	0.2653
20	0.333	0.0175	0.0698	0.1396	0.2792

These values can be interpolated for backlash or distances not shown in the table.

$$\text{Backlash in ArcMinutes} = \left( \frac{\text{Linear Backlash in inches} \times 57.296}{\text{Radius}} \right) 60$$

## Calculation Example

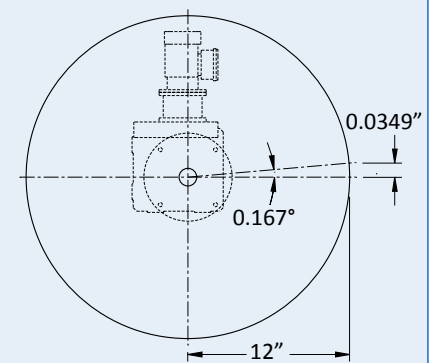
The Backlash Comparison chart can be used to determine the amount of linear movement that will be realized with a given backlash value.

### Example:

A "K" Series gearhead is mounted, with the output shaft vertical, under a 24" diameter turntable. The gearhead backlash is 10 arcminutes.

Reading across the table, the angular value of 10 arcminutes is 0.167 degrees.

Further determination indicates 10 arcminutes backlash will allow a linear movement of 0.0349 inches when measured at a 12 inch radius.



## Gearhead Installation Notes

ServoFit Gearheads are a high torque product. To insure that the specified torque ratings are attained, several series require high quality grade fasteners to attach the gear units to the machine:

ServoFit Series	Grade
C, F, K, KL, KS, KSS, P, PA, PE, PK, PKX	10.9
PH, PHA, PHK, PHKX, PHQ, PHQA, PHQK	12.9

For dynamic applications key connections should be avoided and the clearance of the key connection increases.