Figure 1

Dynamic eccentricity is described as the misalignment created by the shaft not rotating about its true centerline. This is produced by a bent shaft, an improperly supported shaft, or a shaft with high side loads. A non-spring loaded oil seal will accommodate dynamic eccentricity of .003 total indicator reading when operated between 0 and 2500 ft. per minute. A spring loaded oil seal will handle .020 total indicator reading when operated between 0 and 1000 ft. per minute, .015 total indicator reading when operated between 1000 and 2500 ft. per minute, and .010 when operated between 2500 and 4500 ft. per minute.
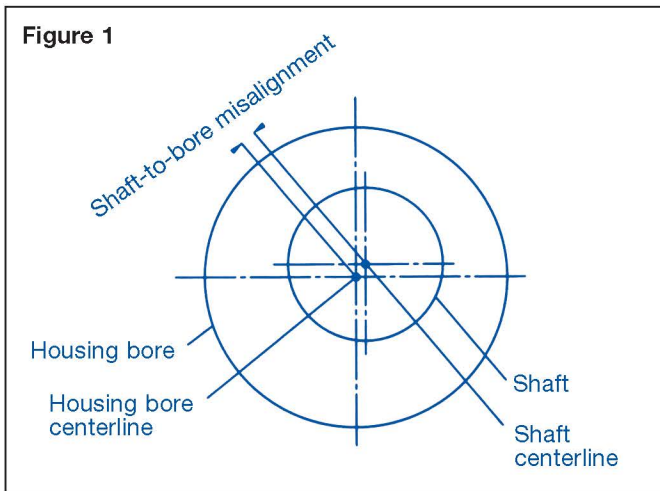

Figure 1

Shaft to bore Misalignment
The distance that the center of the shaft rotation is from the center of the bore.

Figure 2

Seals with increased width are more capable of handling both dynamic and static eccentricities. This is a result of the seal's increased beam length, and the resulting lack of resistance within the seal lip to following the eccentric motion of the shaft surface.

Figure 2
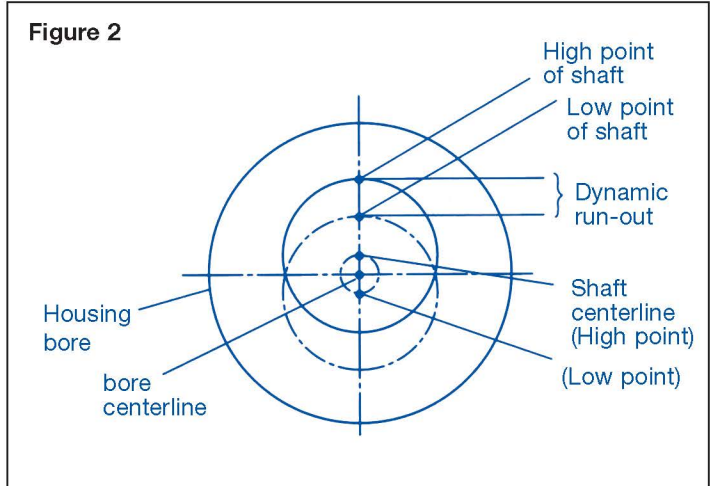
Dynamic run-out
Dynamic run-out is calculated as twice the distance that the center of the shaft is displaced from the actual center of rotation.

Shaft Tolerance Chart

The following chart shows the recommended shaft tolerance for use with Tobar oil seals. Other requirements in the overall design may require tighter tolerances for the shaft than are shown in this chart.

INCHES	
Nominal Shaft Diameter	Tolerances
Up to and including 4.000	±.003
4.001 to 6.000	±.004
6.001 to 10.000	±.005
10.001 and larger	±.006

Design Exceptions

The design recommendations in this catalog are only suggestions and do not imply that designs outside of these recommendations will not function. Tobar recommends, in all cases, that thorough functional testing be conducted on all designs to ensure their success. Trade-offs between temperature, pressure, shaft speed, eccentricity, and seal style to handle conditions beyond those stated in this catalog may be possible. However, care and thorough testing are recommended for satisfactory results.

Tobar, Inc.