

BEARING INSTALLATION AND RETENTION

GENERAL

A bearing in the free state is not a functioning bearing. Its performance begins only after it has been installed into its end assembly, and the methods, fits and forces applied in installation will often determine its success or failure in service.

A surprising percentage of early bearing failures can be traced directly to improper mounting conditions. Some examples of frequently occurring installation errors are:

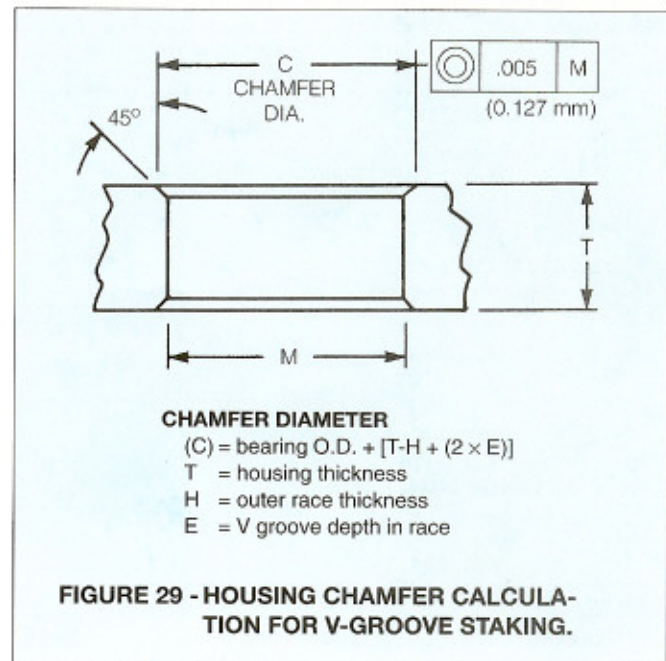
- (1) excessive interference fit between housing bore and bearing O.D.
- (2) improperly designed staking tools.
- (3) excessive staking forces applied.

The following pages are offered not as a comprehensive guide to answer all questions regarding fits, installation, retention, etc., but rather to point out to the bearing user certain areas that require attention and consideration if the installation is to provide for optimum bearing performance and life.

HOUSINGS

The housing into which the bearing is to be mounted should be designed to ensure the structural integrity and dynamic performance capability of the bearing. NMB offers the following housing design recommendations:

1. Bearing-to-housing fit: (See table 7).
2. Bore finish : 32 RMS (0.8 μ mRa)
3. Roundness within the bore diametrical tolerance.
4. Bore perpendicular to housing faces within .002" (0.05 mm).
5. Housing width : uniform within .005" (0.13 mm) to ensure staking integrity.
6. Maximum edge breaks of .005" (0.13 mm) when housing is to be staked over bearing.
7. Chamber sizes as calculated per figure 29 formula for V-groove staking retention.
8. Provide for plating or other surface treatments (as may be required) if housing and bearing are of dissimilar metals. (See table 6).



Another material consideration, in addition to dissimilar metals, is that of differing coefficients of thermal expansion between the bearing and housing materials. When the bearing is to be operating over a broad temperature range, and the mating bearing and housing have different coefficients of expansion, special adjustments may be required in the bearing to housing fit to prevent either excessive looseness or excessive torque at temperature extremes.