

TB002 (Rev1) - Ballscrew Support Bearing Arrangements

The following examples show the various ballscrew support bearing combinations we have encountered on various "CNC" machine frames, and a discussion of the pro's and cons for each type:

Ball Screw Support Bearings—MATCHED PAIR

BEST !

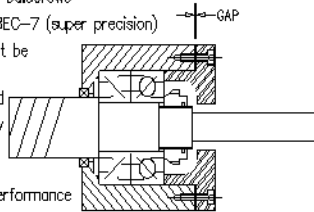
Use for precision machine positioning with ballscrews

60° - 65° Angular contact bearings ABEC-7 (super precision)

matched duplex pairs. Foolproof - cannot be over tightened. High axial thrust capacity, smooth rotational characteristics for good positioning repeatability, low drag, very low bearing axial play (lash) <.0001"

USE: Fafnir MM or Barden LXXXH

Not cheap - but necessary for reliable performance and repeat machine sales!



Angular contact or radial ball bearings - non matched pairs

POOR

For non-precision machine positioning performance

Non matched duplex pairs

Advantage: very inexpensive,

cannot be over tightened,

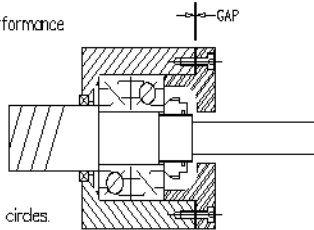
will allow excessive axial play (back lash)

>.001", will wear quickly due to low

thrust capacity. Machined parts tolerances

will be very poor. Machine won't cut round circles.

Customer may not buy another one of your machines!



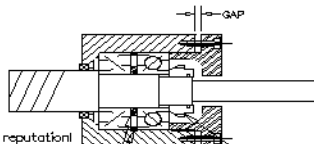
Shimmed bearing pair - any type UNACCEPTABLE

The tolerances required for proper shimming is in the micron range. It is not possible to perform this kind of engineering in the field.

Shimmed bearings will be hard to turn, requiring that the servo motor work very hard. Servo motor failure and bearing failure are assured within a very short time. A real threat to your reputation!

Individually ground spacers to set bearing preload - shim tolerances in the micron range !!

The only proper correction for this problem is to replace with a matched set of bearings as specified above!



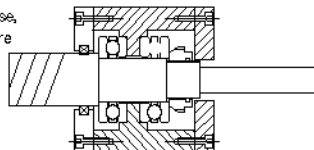
TEST: If tightening this nut causes a change in drag, spacers are ground incorrectly

Roller thrust bearings

UNACCEPTABLE

Ball Thrust Bearings

Impossible to properly load. Either too loose, or too tight. The longer they run, the more they expand due to heat, which causes thermal runaway. Servo motor and bearing failures are assured. Lots of machine down-time. A real threat to your reputation!



The only proper correction for this problem is to re-engineer housing and replace bearings with a set of precision matched ballscrew support bearings !!

