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 дульце pairs. Preferrable — cannot be over tightened. High side thrust capacity, smooth rotational characteristics for good positioning repeatability, low drag, very low bearing end play (less <0.0001"
- USE: Fafnir MR or Beaver L5000
- Not cheap — ball necessary for reliable performance, and recall may be needed.

**Angular contact or radial ball bearings — non matched pairs**

**POOR**

For non-precision machine positioning performance
- Non-matched дульце pairs
- Advantage: very inexpensive, cannot be over tightened
- will show excessive backlash (less bad)
- >0.007", wear quickly due to low thrust capacity. Matched parts tolerances will be very poor. Machine will not run circles
- Customer may not buy another one of your machines.

**Shimmed bearing pair — any type**

**UNACCEPTABLE**

The technology required for proper shimming is in the machine range.
- It is not possible to perform the kind of engineering in the field.
- Shimmed bearings will be hard to keep requiring that the service engineer work very hard. Serve motor failure and bearing failure are common within a very short time. A real threat to your investment

- Individually ground eccentric to get bearing preload — shim tolerances in the micron range.1
- The only proper correction for this problem is to purchase with a matched set of bearings as specified above.

**Roller thrust bearings**

**UNACCEPTABLE**

Ball Thrust Bearings
- Impossible to properly load. Either too loose, or too tight. The longer that run, the more they expand due to heat which causes thermal runaway. Serve motor and bearing failures are assured lots of machine downtime. A real threat to your investment.

- The only proper correction for this problem is to have the right bearing and reduce bearing loads with a set of precision matched ballscrew support bearings.