

Product Service Bulletin

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Ask the experts

Q: *I have a horizontal motor and I can push on the shaft and it moves in and out about an 1/8". What is wrong with the motor?*

A: *Many motor designs do not use bearing caps. Instead wave washers are used on the non-drive end of the motor. If you push on the shaft and let go and it returns to its original location, then the motor is acting as designed. If the shaft does not return to its original position, the motor should be inspected.*

Motor End Play Adjustment - Part One

By: Fred Spaid

End play is defined as the amount of free axial travel the rotor has when thrust in either direction. Setting the axial end play on vertical high thrust motors is essential to proper motor operation and bearing life. Improper end play setting could result in premature bearing failures along with motor and pump damage.

If end play is excessive, it can allow the thrust bearing to separate when motors go into zero thrust or momentary up thrust. If the motor goes into zero or up thrust, the rolling elements may start to slide rather than roll and the guide bearing will take the thrust load. If the end play is insufficient, it can preload the bearings resulting in extreme temperatures and premature bearing failure.

The end play adjustment procedure will depend upon the location of the thrust bearing (upper end or lower end). Use the tables on Page 2 for the proper end play setting.

Lower End Thrust Bearings

For motors with the thrust bearing in the lower end, the end play setting is adjusted by adding shims above the upper guide bearing. The end play

should be checked several times to make sure it is set correctly. Once the end play is set, make sure the rotor turns freely and there is no rubbing of components. Use table on page 2 to get the correct end play setting for lower end thrust bearings.

Upper End Thrust Bearings Without Compression Springs

To adjust the end play, the locknut above the bearing mount is tightened until the lower bearing contacts the bearing cap fingers. The locknut is then backed off until the correct end play is achieved. The lock washer tab is bent up into the slot in the locknut to secure the locknut in position. This should be done several times to make sure the end play is set correctly. Once the end play is set, the rotor should be turned to ensure the components turn freely and nothing is rubbing. Use the table on page 2 for the proper end play setting for thrust bearing in the upper end. Care should be taken to ensure the locknut is not over tightened. Over tightening the locknut could possibly cause the end play to be incorrectly set.



Table 1:
Lower End Thrust Bearings

Angular Contact Thrust bearing(s) (7XXX) in Lower End of Motor

FRAME	TYPE	SETTING
182 thru 286	TU, TV4, LU, LV4, EU, EV4, NU, NV4, AU, AV4	.015 - .020
324 thru 365	TU, TV4, LU, LV4, EU, EV4, NU, NV4	.020 - .025

Note: Motors with thrust bearings in the back to back configuration (7XXX), a double-row angular contact bearing (5XXX) or a standard deep groove ball bearing (6XXX) in the lower end of the motor do not require shimming. The end play is set by the internal clearance in the lower bearing.

Note: Motor type codes containing an "E" or "I" are mechanically the same as motor types that do not contain these letters, e.g.: TVEI4 is mechanically the same as a TV4.

Table 2:
Upper End Thrust Bearings Without Compression Springs

Angular Contact Bearing(s) (7XXX)

Frame	TYPE	SETTING
324 thru 365	RU, RV4	0.005 to 0.008
404 & UP	RU, RV4, HU, HV4, TU, TV4, LU, LV4, EU, EV4 NU, NV4, JU, JV4	
449	JV, JV3	
6808 & UP	HV, RV	

Note: Motors with back to back bearing configuration do not require end play setting. In this case, the AH dimension is set by adjusting the locknut above the bearing mounting until the correct AH dimension is achieved.

Note: Motor type codes containing an "E" or "I" are mechanically the same as motor types that do not contain these letters, e.g.: RVEI4 is mechanically the same as an RV4.