

Instruction Manual for Keyless Bushings Series AA thru SS



Installation

Warning: Be sure all power switches are locked out when installing or removing Keyless Locking Bushings that mount the drive component to the shaft. Use protective eyewear and practice industrial safety standards at all times. *Relax any tension or torque to the drive component being mounted or removed.*

Tools Required: Allen Wrenches, Torque Wrench.

Note: Keyless Bushings provide an interference fit that will transmit high torque and provide for zero backlash in the drive component. Please follow these installation instructions to ensure the drive component is installed properly. Recognize that some screws/threads in the Keyless Bushings are used to loosen the bushing while others are intended for tightening.

1. PTI Keyless Bushings are supplied with a light coating of oil/preservative and are shaft ready for installation. Refer to Chart 1 for an overview of the general features of the various standard bushing series.
2. Most Keyless Bushings are self centering and all fit straight bore hubs and shafts. Keyways are not required as the heavy interference fit that results from a properly tightened bushing will transmit torque. Keyless Bushings can be installed over a keyway. (See Pg 2.)
3. Friction contact between a properly tightened bushing on the shaft and drive component will transmit torque. The frictional coefficient of lightly oiled metal on metal components ($\mu = 0.12$ to 0.13) has been used to determine product ratings. Therefore, the use of Molykote, Never-Seez or similar coatings on a shaft or drive component is not recommended as these coatings will reduce the friction between the installed drive component and reduce the torque ability of the drive.
4. Ensure all locking screws, shafts and tapered components within the bushing and bore of the drive component are clean, free of burrs and are of the proper diameters. Splits in the keyless bushing should be aligned if parts are loose.
5. Use the removal screw threads to help separate (loosen) the tapered components. This reduces the bushing OD and allows the bushing to slip into the drive product and onto the shaft. This may require loosening locking screws 3-4 turns.
6. With the bushing and drive product loosely positioned on the shaft, consider the alignment and future position of the mounted components. The bushing can always be loosened, the drive product position adjusted, and the bushing re-tightened to improve alignment.
7. Hand tighten the locking screws (mounting screws) in either a consistent clockwise or counter clockwise sequence. Tighten each screw by a 1/4-turn to keep components concentric and tightening at the same rate. For bushings with a shoulder, keep the shoulder positioned next to the drive component during the tightening process.
8. The hand tightening sequence described above is preferred.



Fig. 1

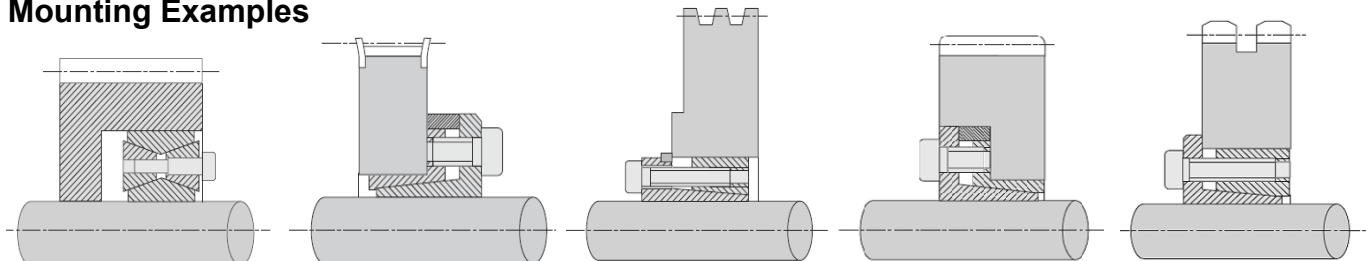
Chart 1

Type	AA	AB	BB	CC	DA	DB	EE	FF	FC	GG	HH	MM	NN	PP	RR	SS
Self Centering	•	•	•	•	•	•	•	•							•	•
Not Self Centering									•	•	•	•	•	•		
Minimum Radial Dimensions				•				•	•				•			
Quick Assembly	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•
Low to Medium Torque								•			•		•			•
Medium to High Torque	•	•		•					•	•		•		•	•	
High Torque			•		•	•	•									

When screws can no longer be tightened by hand more than a 1/4-turn, check each screw one or two more times as a final check. It is normal for adjacent screws to loosen slightly (or allow re-tightening).

9. Next, using a torque wrench set to the proper level for the screw size, begin tightening each screw to the same torque with the 1/4-turn sequence. See Chart 2 for the recommended torque level for screws by bushing type. Repeat the tightening sequence with the torque wrench, increasing the torque with each pass until the recommended torque level is reached. Re-check each screw to ensure the recommended torque is achieved.
10. The torque that can be transmitted by these bushings increases with a dry contact of metal surfaces. Dry parts may transmit 20-25% more torque. After 24 hours of operation, it is good practice to re-check any installed drive product regardless of the shaft attachment method.
11. For applications subject to extreme corrosion, the split in each bushing ring may be filled with a suitable joint filler or sealant to limit contamination from entering the bushing. This will make future removal easier.

Mounting Examples





Keyless Bushings Over a Keyway

The split in the Keyless Bushing bore should be positioned opposite the keyway in the shaft and a tightening screw positioned directly over the keyway. Ensure that there are no burrs on the shaft from the keyway or from any previous set screws that may have "upset" the shaft material and hinder the installation. Smooth over set screw dimpled or damaged areas with a file or other suitable means to maximize contact with the shaft and drive component. Follow the tightening procedure outlined in the steps above.

Removal

Prior to loosening the Keyless Bushing, ensure that any torque or thrust loads have been removed from the drive. Only loosen the Bushing on freely mounted components.

Loosen all of the mounting screws by 4-5 turns. Some units have additional holes visible on the front face. These threaded face

holes can be used to assist in loosening the Bushing. When needed, insert enough locking screws to be used as removal screws in the removal holes. (The GG series will require a larger screw for removal, which is not provided and the removal screw is usually one size larger). Tightening the removal screws will loosen the bushing from the shaft. For Keyless Bushings that have experienced severe corrosion or contamination, a penetrating lubricant may help free the parts. Tapping on several of the removal screws with a hammer during the loosening process may help loosen frozen or corroded hubs.

Note: Removal screw hole can be identified by the thread holes which are visible on the face of the outer ring of the bushing. On the GG Series Bushings, there are several cadmium plated screws (quantity will vary by bushing size). Under each of these screws is a larger thread on the face that are to be used to for bushing removal. Insert a screw (not provided) into these removal threads. Tighten the removal screw to loosen the matching bushing tapers so the drive component can be replaced or aligned.

Locking Screw Torque (Nm) by Bushing Type

Chart 2

Screw Size	Torque (Nm)	Torque (Nm)	Torque (Nm)	Torque (Nm)	Torque (Nm)	Torque (Nm)	Torque (Nm)	Torque (Nm)	Torque (Nm)	Torque (Nm)	Torque (Nm)	Torque (Nm)	Torque (Nm)
Series	AA	AB	BB	CC	DA	DB	EE	GG	HH	MM	PP	RR	SS
M2.5													1.2
M3													2
M4				5							4		5
M5											4		10
M6	14	17		17	17	17	17	14	17	17	12	17	17
M8	35	41	41	41	41	41	41	35	41	41	30	41	41
M10	70	83		83	83	83	83	70	83	83	59	83	
M12	125	145		145	145	145	145	125			100		
M14	190	230			230	230	230	190					
M16							360				250		

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Warning: Because of the possible danger to person(s) or property from accidents which may result from the improper use of products, it is important that correct procedures be followed. Products must be in accordance with the engineering information specified in the catalog. Proper installation, maintenance and operation procedures must be observed. All instructions in the instruction manuals must be followed. Inspections should be made as necessary to assure safe operation under prevailing conditions. Proper guards and other suitable safety devices or procedures as may be desirable or as may be specified in safety codes should be provided, and are neither provided by P.T. International, nor are the responsibility of P.T. International. This unit and associated equipment in the system must be installed, adjusted and maintained by qualified personnel who are familiar with the construction and operation of all equipment in the system and the potential hazards involved. When risk to persons or property may be invoked, a holding device must be an integral part of the driven equipment beyond the speed reducer output shaft.