



PRODUCT APPLICATION NOTES

Volume 53, No. 8
October, 2006

Taper-Lock[®] and QD[®] Bushing Installation and Removal

Taper-Lock[®] and QD[®] bushing installation is critical to good belt drive performance. Improper installation can damage the bushing and/or the sprocket/sheave. Sprockets/sheaves are commonly mounted to a shaft with a tapered bushing that fits a mating tapered bore in the sprocket/sheave. Bushings are available in numerous bore diameters to accommodate a broad range of shaft sizes used in industry.

Taper-Lock Bushing Installation and Removal

To Install TAPER-LOCK Type Bushings

1. Clean the shaft, bore of bushing, outside of bushing and the sprocket/sheave hub bore of all oil, paint and dirt. File away any burrs.

Note: The use of lubricants can cause hub fracture. DO NOT USE LUBRICANTS when installing tapered bushings.

2. Insert the bushing into the sprocket/sheave hub and align the holes. All of the holes should be half threaded. The installation holes will be threaded on the sprocket side, but not the bushing side. The removal holes will be threaded on the bushing side, but not the sprocket side. See Figure 1 below.

3. "LIGHTLY" oil the bolts and thread them into the half-threaded installation holes indicated by the white installation holes in Figure 1.

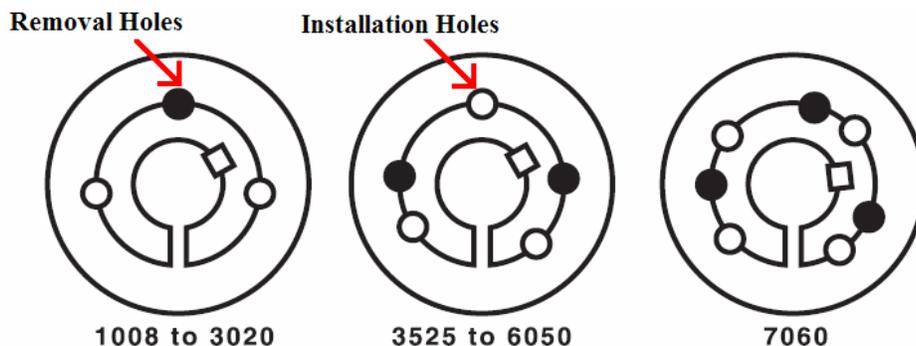


Figure 1 – Taper-Lock Bushing Installation Diagrams

Note: Do not lubricate the bushing taper, hub taper, bushing bore, or the shaft. Doing so may result in sprocket/sheave hub fracture. **DO NOT USE LUBRICANTS**

4. With the key resting in the shaft keyway, position the sprocket/sheave and bushing assembly onto the shaft allowing for small axial movement of the sprocket/sheave which will occur during the tightening process.

Note: When mounting sprockets/sheaves on a vertical shaft, precautions must be taken to positively prevent the sprocket/sheave and/or bushing from falling during installation.

5. Alternately torque the bushing bolts until the sprocket/sheave and bushing tapers are completely seated together (use approx. half of the recommended bolt torque; see Table 1).

Note: Do not use worn hex key wrenches. Doing so may result in a loose assembly or may damage bolts.

6. Check the alignment and axial sprocket/sheave run out (wobble), and correct as necessary.

7. Continue alternate tightening of the bolts to the recommended torque values specified in Table 1 below.

Taper-Lock[®] Bushings

Bushing Style	Bolts		Torque Wrench	
	Qty.	Size	lb-ft	lb-in
1008	2	1/4-20 x 1/2	4.6	55
1108	2	1/4-20 x 1/2	4.6	55
1210	2	3/8-16 x 5/8	14.6	175
1610	2	3/8-16 x 5/8	14.6	175
2012	2	7/16-14 x 7/8	23.3	280
2517	2	1/2-13 x 1	35.8	430
3020	2	5/8-11 x 1 1/4	66.7	800
3525	3	1/2-13 x 1 1/2	83.3	1000
4030	3	5/8-11 x 1 3/4	141.7	1700
4535	3	3/4-10 x 2	204.2	2450
5040	3	7/8-9 x 2 1/4	258.3	3100
6050	3	1 1/4-7 x 3 1/2	651.7	7820
7060	4	1 1/4-7 x 3 1/2	651.7	7820

Caution: Excessive bolt torque can cause sprocket/sheave and/or bushing breakage.

Note: To insure proper drive performance, full bushing contact on the shaft is recommended.

Table 1 – Taper-Lock Bushing Bolt Torque Values

8. To increase the bushing gripping force, firmly tap the face of the bushing using a brass drift or punch (Do not hit the bushing directly with the hammer).

9. Re-torque the bushing bolts after Step 8. After reaching the recommended bolt torque value once, stop. Continued tightening to the recommended torque level will over insert the bushing.

10. Recheck all bolt torque values after the initial drive run-in, and periodically thereafter. Repeat steps 5 through 9 if loose.

To Remove TAPER-LOCK® Type Bushings

1. Loosen and remove all mounting bolts.
2. Insert bolts into all jack screw holes indicated by dark removal holes in Figure 1 on page 1.
3. Loosen the bushing by alternately tightening the bolts in small but equal increments until the tapered sprocket/sheave and bushing surfaces disengage.

QD® Bushing Installation and Removal

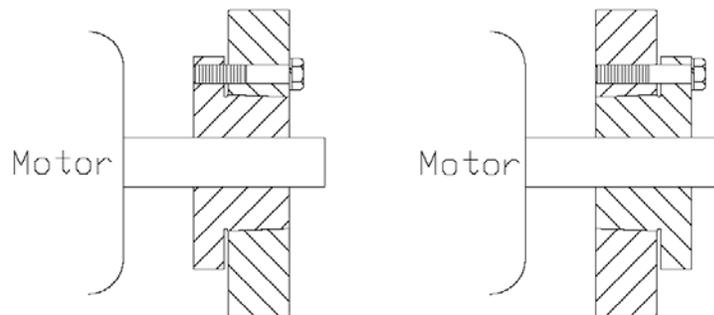


Figure 2 – Conventional and Reverse Mounting

Conventional mounting is accomplished by placing the bolts through the sprocket/sheave first and then threading into the bushing. The assembly is then placed onto the shaft with the bushing flange facing inward and the bolt heads facing outward. See Figure 2.

Reverse mounting is accomplished by placing the bolts through the bushing first and then threading into the sprocket/sheave. The assembly is then placed onto the shaft with the sprocket/sheave facing inward and the bolt heads facing outward. See Figure 2. Conventional mounting is generally the preferred method.

To Install QD Type Bushings

1. Clean the shaft, bushing bore, outside of bushing and the sprocket/sheave hub bore of all oil, paint and dirt. File away any burrs.

Note: Do not lubricate the bushing taper, hub taper, bushing bore or the shaft. Doing so may result in sprocket/sheave hub fracture. **DO NOT USE LUBRICANTS.**

2. For a *conventional mount*, assemble the sprocket/sheave and bushing combination by sliding the sprocket/sheave taper bore into position over the mating tapered bushing surface. Align the unthreaded holes in the sprocket/sheave hub with the threaded holes in the flange of the bushing. Hand-tighten the cap screws with lock washers installed. The sprocket/sheave and bushing assembly will mount onto the shaft, with the bushing flange facing inward.

Some sprocket/sheave assemblies will allow a reverse mount procedure. This results in the bushing flange facing outward, but still allows the cap screw installation from the outside of the assembly. The cap screws fit through the unthreaded holes of the bushing flange and into the threaded holes of the sprocket/sheave hub.

3. With the key resting in the shaft keyway, position the assembly onto the shaft allowing for small axial movement of the sprocket/sheave, which will occur during the tightening process.

When installing large or heavy parts in a conventional mount, it may be easier to mount the key and bushing on the shaft first, then place the sprocket/sheave on the bushing and align the holes.

Note: When mounting sprockets/sheaves on a vertical shaft, pre-cautions must be taken to prevent the sprocket/sheave and/or bushing from falling during installation.

4. Alternately tighten the cap screws until the sprocket/sheave and bushing tapers are completely seated together (use approx. half of the recommended bolt torque; see Table 2).

5. Check the alignment and axial sprocket/sheave run out (wobble), and correct as necessary.

6. Continue alternate tightening of the cap screws to the recommended torque values specified in Table 2 below. Do not tighten cap screws further once the recommended torque is reached.

Note: Excessive bolt torque can cause sprocket/sheave and/or bushing breakage. When properly mounted, a gap between the bushing flange and sprocket/sheave should exist.

QD[®] Bushings

Bushing Style	Bolts (in)		Torque Wrench	
	Qty.	Size	lb-ft	lb-in
H	2	1/4 x 3/4	7.9	95
JA	3	10-24 x 1	4.5	54
SH & SDS	3	1/4-20 x 1 3/8	9.0	108
SD	3	1/4-20 x 1 7/8	9.0	108
SK	3	5/16-18 x 2	15.0	180
SF	3	3/8-16 x 2	30.0	360
E	3	1/2-13 x 2 3/4	60.0	720
F	3	9/16-12 x 3 5/8	75.0	900
J	3	5/8-11 x 4 1/2	135.0	1620
M	4	3/4-10 x 6 3/4	225.0	2700
N	4	7/8-9 x 8	300.0	3600
P	4	1-8 x 9 1/2	450.0	5400
W	4	1 1/8-7 x 11 1/2	600.0	7200
S	5	1 1/4-7 x 15 1/2	750.0	9000

Caution: Excessive bolt torque can cause sprocket/sheave and/or bushing breakage.

Note: To insure proper drive performance, full bushing contact on the shaft is recommended.

Table 2 – QD Bushing Bolt Torque Values

7. Tighten the set screw, when available, to hold the key securely during operation.

To Remove QD Type Bushings

1. Loosen and remove all mounting bolts.

2. Insert cap screws into all threaded jack screw holes.

3. Loosen the bushing by first tightening the screw furthest from the bushing saw slot, then, alternately tighten remaining screws. Keep tightening the screws in small but equal increments until the tapered sprocket/sheave and bushing disengage.

Note: Excessive or unequal pressure on the bolts can break the bushing flange, making removal impossible without destroying the sprocket/sheave.

