Keyless Bushing

- Overview -

**Features of Keyless Bushing**

- The Keyless Bushing is a fastening tool to tightly fasten a hub to a shaft by using friction. It is accomplished by converting screw tightening power into pressure on the tapered inner diameter surface of the hub and the tapered outer diameter of the shaft.
- A hub (such as pulleys, gears, and sprockets) can be easily connected with a shaft by screwing.
- It is well suited to applications with repeated forward / backward rotation as it virtually eliminates backlash.
- It can also handle some thrust.
- Design allows for infinite phase adjustment after installation.
- It saves complex key machining on shafts and hubs as well as polishing in assembling, which leads to total cost reduction.

**Structure of Keyless Bushing**

1. Wipe off the shaft surface and apply oil or grease.
2. Wipe off and apply oil and grease on contact surfaces of Keyless Bushing and Hub.
3. Please insert the shaft after assembling the Keyless Bushing and Hubs temporarily.
4. After locating, tighten the lock screws using a torque wrench in the diagonal line order.
5. Tighten the screws further to an increased torque (approximately 1/2 specified torque).
6. Tighten the screws up to specified torque.
7. Tighten the screws in circumferential order.
8. Tighten the screws in diagonal line order, beginning lightly (approx. 1/4 of the predetermined tightening torque).
9. Make sure to apply oil or grease before installation.
10. Do not use lock screws other than those included.

**Installation**

1. Wipe off the shaft surface and apply oil or grease. (Do not use any oil or grease containing molybdenum sulfide).
2. Wipe off and apply oil and grease on contact surfaces of Keyless Bushing and Hub. Apply oil or grease to the thread and seat of lock screws.
3. Please insert the shaft after assembling the Keyless Bushing and Hubs temporarily. (Please do not tighten the screws before inserting the shaft.)
4. After locating, tighten the lock screws using a torque wrench in the diagonal line order, beginning lightly (approx. 1/4 of the predetermined tightening torque).
5. Tighten the screws further to an increased torque (approximately 1/2 specified torque).
6. Tighten the screws up to specified torque.
7. Finally tighten the lock screws in circumferential order.

**Removal**

- Be sure to work on the system is completely shut down.
- Loosen the lock screws in circumferential order.
- Insert a screw in a hole for removal and tighten evenly.
- Repeat “Installation” process for re-installation.

**Selection Table**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>MLSL</th>
<th>MLR / MLRP MLMB</th>
<th>MLA / MLAP MLN / MLNB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Page</td>
<td>P1196</td>
<td>P1197</td>
<td>P1199</td>
</tr>
<tr>
<td>Series</td>
<td>Thin Type</td>
<td>Compact Type</td>
<td>Standard Type</td>
</tr>
<tr>
<td>Allowable Torque</td>
<td>Acceptable</td>
<td>Good</td>
<td>Good</td>
</tr>
<tr>
<td>Tightness</td>
<td>Excellent</td>
<td>Good</td>
<td>Good</td>
</tr>
<tr>
<td>Engagement</td>
<td>Excellent</td>
<td>Good</td>
<td>Good</td>
</tr>
<tr>
<td>Installation</td>
<td>Excellent</td>
<td>Good</td>
<td>Good</td>
</tr>
<tr>
<td>Price</td>
<td>Excellent</td>
<td>Good</td>
<td>Good</td>
</tr>
</tbody>
</table>

**Features**

- Make sure to apply oil or grease before installation.
- Tighten the tapered portion of inner ring and outer ring will get into each other even with a little shock from conveyance. Loosen the screw and nut and disassemble parts to release tapered parts before installation.
- Please insert the shaft after assembling the Keyless Bushing and Hubs temporarily. (Please do not tighten the screws before inserting the shaft. Keyless Bushing may deform.)
- Tighten the screws further to an increased torque (approximately 1/2 specified torque).
- Tighten the screws up to specified torque.
- Finally tighten the lock screws in circumferential order.

**Reference**

- Do not tighten the screws before inserting the shaft.
- Do not use lock screws other than those included.
- Use torque wrench to tighten screws.
- Apply oil or grease to the thread and seat of lock screws.

**Hub Minimum Outer Diameter Table**

<table>
<thead>
<tr>
<th>Hub Minimum Outer Diameter</th>
<th>Main Body Material</th>
<th>Carbon Steel</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>1010 Carbon Steel</td>
<td>1018 Carbon Steel</td>
</tr>
<tr>
<td>12</td>
<td>1035 Carbon Steel</td>
<td>FCD Cast Iron 450</td>
</tr>
<tr>
<td>15</td>
<td>1055 Carbon Steel</td>
<td>FCD Cast Iron 600</td>
</tr>
</tbody>
</table>

**How to Determine Hub Outer Diameter**

After selecting Keyless Bushing size as well as hub size and material, confirm that the selected values meet the conditions H ≤ hub minimum outer diameter in the right table. 

**Recommended Tolerance of Shaft and Hub**

- Shaft: ±0.005 in
- Hub: ±0.005 in
- Finish surface roughness at or below 16. μm in shaft and 3.2 μm in hub.

**Note**

- Do not tighten the screws before inserting the shaft.
- Use torque wrench to tighten screws.
- Apply oil or grease to the thread and seat of lock screws.

**Part Number**

<table>
<thead>
<tr>
<th>Order Example</th>
<th>Part Number</th>
<th>MLSL 1G</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hubs to Ship</td>
<td>3 Days</td>
<td>M8 x R8</td>
</tr>
</tbody>
</table>

**Volume Discount Rate**

- For larger quantity orders “Days to Ship” may differ from published catalog term.

**Reduced Days to Ship**

- For larger quantity orders “Days to Ship” may differ from published catalog term.