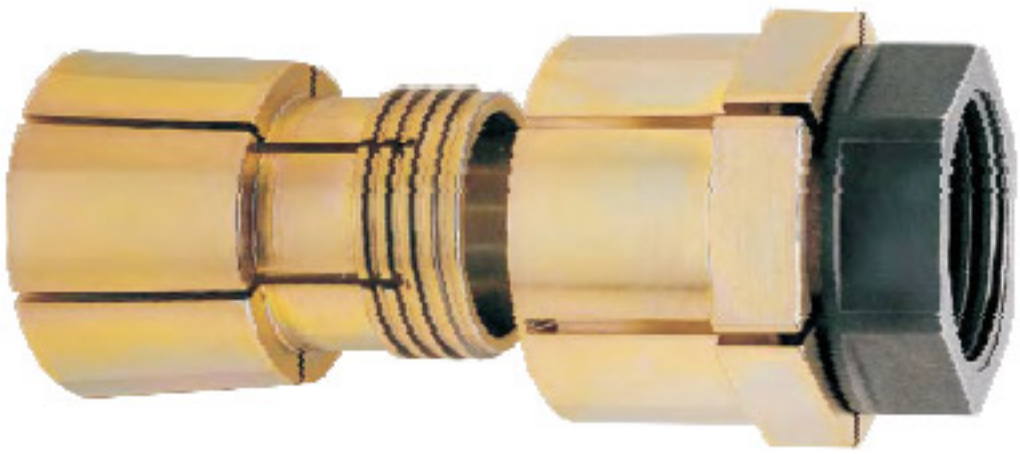
Yashimpex

# TRANLOCK



6L

# 6L... Tranlock

## Keyless Bushings & Specialty Locking Devices

From the moment the wheel came into existence man has been faced with the seemingly simple task of mounting his invention to a shaft so that something useful could be accomplished. Though it has been over 5500 years since these rotating components have made their way into use, many designs still utilize mounting methods not much improved from the days of antiquity. These traditional connection methods includes: **Interference fits (shrink or press), keys and keyways, splines and quick detachable bushing. In the section that follows, we compare and contrast these component mouning techniques and explain the principles behind behind the ingenious Tranlock Keyless bushing**

## Why Go Keyless

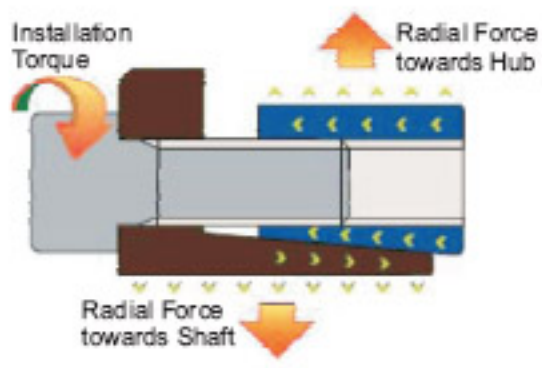
Today's global marketplace demands precise, efficient machines that optimize productivity while minimizing material and fabrication costs. When compared to traditional connection methods. JMR Tranlock Keyless Bushing Offer the following advantages:

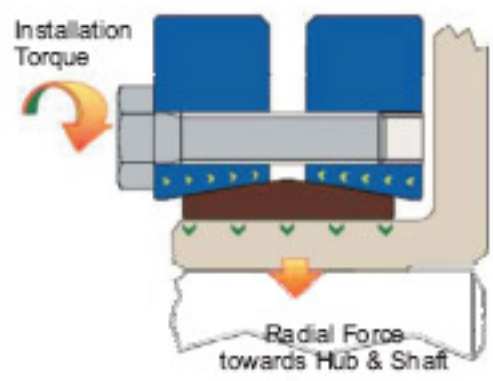
**A mechanical interference fit with a uniform pressure distribution similar to that achieved through a shrink or press fit.**
**A true zero backlash shaft-to-hub connection with need not be over-sized to compensate or notch factors.**
**This allows the use of smaller shafts and bearing for more cost effective designs.**
**The flexibility to mount over existing keyways if desired.**
**Straight bore machining of the mounted component generous machine tolerances and as turned surface finishes**
**Complete axial and radial adjustability.**
**Simple installation, adjustment and removal, even in the field**

## Principles of Operation

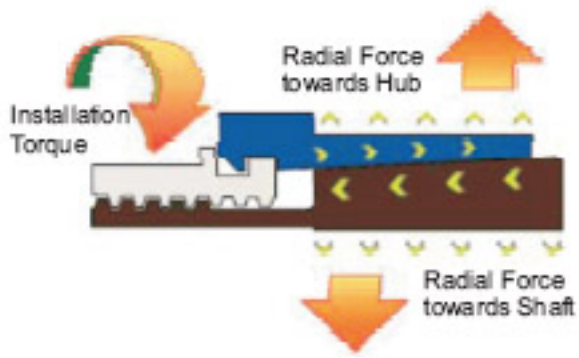
Though offered in many shapes and sizes, JMR Tranlock Keyless Bushing and specialty Locking Devices all operate using the simple wedge principle. An axial force is applied by either a hex nut or a series of annular screws-to engage circular steel ring with mating Tapers. In the case of keyless bushing, the resulting wedge action creates a radial force on the tapered rings, one of which contracts to squeeze the shaft while the other expands and presses into the component bore In the case of specialty locking devices, similar tapered geometry generates a radial force that is concentrated (in the case of our shrink Discs) around a solid steel hub, squeezing so tightly that the hub "shrinks" onto the underlying shaft, or(in the case of rigid Coupling)simultaneously onto two solid shaft ends to form a high capacity rigid coupling.In all cases, the product of the coefficient of friction between the surfaces being joined equals the rated torque capacity of the connection.

**K Lock**




**Tranlock**



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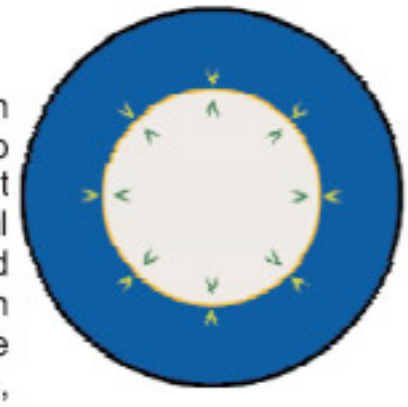
## Traditional Connections Methods

### Interference (Shrink and Press)

A shrink fit is a procedure whereby heat is used to facilitate a mechanical interference fit between two pieces of metal, such as a steel shaft and hub. Extreme heat is applied to the hub, causing it to expand and increasing the size of its machined bore. The expanded hub is removed from the heat source and quickly positioned onto the shaft. As the hub cools, its bore contracts back to its original machined dimension, effectively "shrinking" the hub onto the shaft. A press fit achives the same end as a shrink fit-a mechanical interference fit between a steel shaft and hub-but does so through different means. Press fits rely on the application of simple brute force to "press" the hub onto the shaft. Interference fits offer several advantages, such as zero backlash and uniform fit pressures, but these advantages come at a price. High capacity interference fits require long fit lengths, close tolerances expensive and sometimes hazardous heat source or hydraulic presses and field maintenance is extremely difficult. Finally, separated components can rarely he reused.



**Shrink / Press Fit**

**Key & Keyway**

**Spline**

### Keys, Keyways & Splines

The centuries-old industry standard shaft-to-hub mounting technique is the key and keyway. While ubiquitous and intuitively easy to understand, the key and keyway is a remarkably inexpensive, nor is the equipment required to do so, though these costs are often unknown or overlooked. Keyways introduce notch factors, which account for the reduced effective cross section and abridged fatigue life that occurs when a shaft is keyed and lead, in turn, to systematic over-sizing of shaft material and weight, larger bearing and other drive components, and increased cost

Further, Keyed connection require fit clearance for assembly, both between key and keyway and between shaft and hub the combined effect of these clearances is backlash. In application with frequent starts/stops, direction changes and/or shock overloads, this backlash can lead to pounded out Keyways, Fatigue failures, fretting corrostion or some combination of these failure models. Nor do keys and keyways lend themselves to motion control application, since backlash erodes the accuracy of motion profiles over time.

A splined connection is simply a series of keys and keyways that suffers the same limitations and drawbacks associated with a single keyed connection, Manufacturing costs are high especially on hollow shafts, and special surface treatment is often required to increase strength

### Keyed Bushing Systems

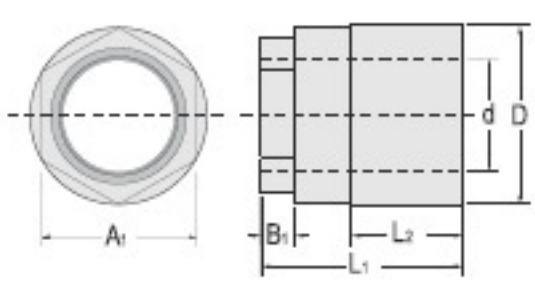
Both QD and Taper Bush and weld-on/Bolt-on hub systems are popular component mounting technologies. Yet both are ultimately keyed connections and as a result suffer from the same operational drawbacks as described above. As their name indicates, the weld-on / Bolt-on hubs require an additional, and expensive, manufacturing step. And while the bushings can be used without a weld-on hub, doing so requires machining a taper and drilling and taper and drilling and tapping holes in the mating part.

**QD**

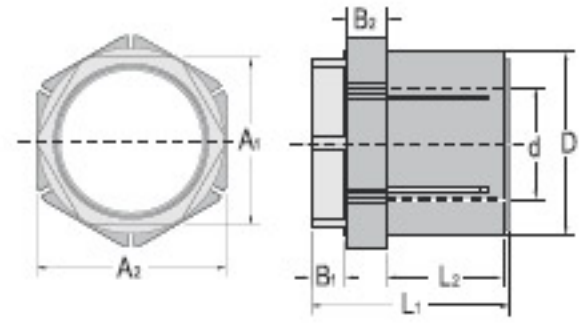
**Taper Bush**

| Comparison Chart | K-LOC | TranLock | Interference Fit | Keyed Connection | Splined Connection | QD or TB Bushing |
|---|---|---|---|---|---|---|
| Keyless Fricitional Connection | Yes | Yes | Yes | | | |
| Infinite radial and axial adjustment | Yes | Yes | | | | |
| Easy installation | Yes | Yes | | Yes | Yes | Yes |
| Easy removal | Yes | Yes | | | | Yes |
| Backlash free connection | Yes | Yes | Yes | | | |
| Transmits shock and torque reversals | Yes | Yes | Yes | | | |
| Transmits reversing bending moments | Yes | Yes | Yes | | | |

# 6L... Tranlock




Upto Shaft Dia.17mm
Type "A"




Type "B"

| Model | Shaft Dia | Hub Bore | Max. | | Hub Pressure | Dimension | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | (d) | (D) | Torque (N-m) | Thrust (KN) | (N/cm2) | L1 | L2 | A1 | A2 | B1 | B2 |
| **3x16x10** | 3 | 16 | 12 | 3 | 3585 | 19 | 10 | 13 | na | 3 | na |
| **4x16x10** | 4 | 16 | 12 | 3 | 3585 | 19 | 10 | 13 | na | 3 | na |
| **5x16x10** | 5 | 16 | 12 | 3 | 3585 | 19 | 10 | 13 | na | 3 | na |
| **6x16x10** | 6 | 16 | 16 | 3 | 3585 | 19 | 10 | 13 | na | 3 | na |
| **7x19x11** | 7 | 19 | 20 | 4 | 2550 | 22 | 11 | 16 | na | 3 | na |
| **8x19x11** | 8 | 19 | 23 | 4 | 2550 | 22 | 11 | 16 | na | 3 | na |
| **9x19x11** | 9 | 19 | 26 | 4 | 2550 | 22 | 11 | 16 | na | 3 | na |
| **10x23x13** | 10 | 23 | 30 | 4 | 1860 | 26 | 13 | 19 | na | 5 | na |
| **11x23x13** | 11 | 23 | 34 | 4 | 1860 | 26 | 13 | 19 | na | 5 | na |
| **12x23x13** | 12 | 23 | 39 | 4 | 1860 | 26 | 13 | 19 | na | 5 | na |
| **14x26x16** | 14 | 26 | 44 | 4 | 1240 | 29 | 16 | 22 | na | 5 | na |
| **15x26x16** | 15 | 26 | 45 | 4 | 1240 | 29 | 16 | 22 | na | 5 | na |
| **16x26x16** | 16 | 26 | 50 | 5 | 1240 | 29 | 16 | 22 | na | 5 | na |
| **17x32x19** | 17 | 32 | 170 | 9 | 5500 | 35 | 19 | 27 | na | 6 | na |
| **15x38x19** | 15 | 38 | 180 | 13 | 7590 | 38 | 19 | 32 | 38 | 8 | 9 |
| **16x38x19** | 16 | 38 | 198 | 15 | 7590 | 38 | 19 | 32 | 38 | 8 | 9 |
| **17x38x19** | 17 | 38 | 220 | 17 | 7590 | 38 | 19 | 32 | 38 | 8 | 9 |
| **18x38x19** | 18 | 38 | 265 | 18 | 7590 | 38 | 19 | 32 | 38 | 8 | 9 |
| **19x38x19** | 19 | 38 | 282 | 20 | 7590 | 38 | 19 | 32 | 38 | 8 | 9 |
| **20x45x22** | 20 | 45 | 290 | 21 | 6480 | 48 | 22 | 38 | 45 | 11 | 10 |
| **22x45x22** | 22 | 45 | 315 | 24 | 6480 | 48 | 22 | 38 | 45 | 11 | 10 |
| **24x45x22** | 24 | 45 | 380 | 27 | 6480 | 48 | 22 | 38 | 45 | 11 | 10 |
| **25x45x22** | 25 | 45 | 390 | 29 | 6480 | 48 | 22 | 38 | 45 | 11 | 10 |
| **28x51x25** | 28 | 51 | 495 | 33 | 5380 | 57 | 25 | 46 | 51 | 13 | 14 |
| **30x51x25** | 30 | 51 | 580 | 35 | 5380 | 57 | 25 | 46 | 51 | 13 | 14 |
| **32x51x25** | 32 | 51 | 680 | 38 | 5380 | 57 | 25 | 46 | 51 | 13 | 14 |
| **34x61x38** | 34 | 61 | 710 | 41 | 4480 | 70 | 38 | 50 | 60 | 14 | 13 |
| **35x61x38** | 35 | 61 | 725 | 42 | 4480 | 70 | 38 | 50 | 60 | 14 | 13 |
| **36x61x38** | 36 | 61 | 750 | 44 | 4480 | 70 | 38 | 50 | 60 | 14 | 13 |
| **38x61x38** | 38 | 61 | 790 | 47 | 4480 | 70 | 38 | 50 | 60 | 14 | 13 |
| **40x67x43** | 40 | 67 | 900 | 50 | 3790 | 79 | 43 | 60 | 67 | 14 | 17 |
| **42x67x43** | 42 | 67 | 1000 | 53 | 3790 | 79 | 43 | 60 | 67 | 14 | 17 |
| **45x73x51** | 45 | 73 | 1170 | 58 | 2900 | 91 | 51 | 65 | 73 | 16 | 19 |
| **48x73x51** | 48 | 73 | 1355 | 63 | 2900 | 91 | 51 | 65 | 73 | 16 | 19 |
| **50x73x51** | 50 | 73 | 1510 | 66 | 2900 | 91 | 51 | 65 | 73 | 16 | 19 |
| **55x80x54** | 55 | 80 | 1650 | 68 | 2400 | 95 | 54 | 70 | 79 | 16 | 21 |
| **60x86x57** | 60 | 86 | 1740 | 69 | 1930 | 98 | 57 | 75 | 86 | 18 | 19 |
| **65x92x60** | 65 | 92 | 1930 | 70 | 1660 | 103 | 60 | 82 | 92 | 18 | 21 |
| **70x92x60** | 70 | 92 | 1920 | 70 | 1660 | 103 | 60 | 82 | 92 | 18 | 21 |
| **75x100x64** | 75 | 100 | 2000 | 72 | 1600 | 108 | 64 | 90 | 98 | 19 | 21 |

# 6L... Tranlock

A Tranlock Keyless Bushing offers flexible and easy installation while providing exceptional holding power. To ensure a Tranlock unit performs as specified, it must be installed properly.

CAUTION: DO NOT USE ANY LUBRICANTS IN THIS INSTALLATION. DO NOT USE AN IMPACT WRENCH IN THIS INSTALLATION.

1. Shaft and component bore must be within (±0.08mm) [±0.04mm Mini Series] of stated bore diameter and must have a surface finish of 32-125 Ra (roughness average). If the surface finish is outside these specified values, consult factory.
2. Both shaft and component bore must be completely free of paint, grease, oil, and dirt. If necessary, clean the surfaces with a non-petroleum based solvent, such as isopropyl alcohol.

CAUTION: DO NOT LUBRICATE THE TRANLOCK BUSHING OR SHAFT. THE USE OF ANY LUBRICANT ON THE CONTACT SURFACES COULD RESULT IN BUSHING FAILURE AND WILL VOID ALL WARRANTIES.

3. Insert the Tranlock unit into the component to be mounted, making sure the mating hub is flush against the shoulder at the hex flats.
4. Position the assembly at the desired location on the shaft and hand-tighten the nut (clockwise) until the assembly becomes snug on the shaft.

CAUTION: DO NOT HAMMER OR USE ANY TYPE OF IMPACT TO FORCE THE TRANLOCK ASSEMBLY ALONG THE SHAFT.

CAUTION: THE SHAFT MUST FULLY ENGAGE THE SHAFT GRIPPING AREA OF THE TRANLOCK UNIT. FIGURE 2 ILLUSTRATES MINIMUM SHAFT ENGAGEMENT.

5. Using a torque wrench, tighten the nut to the proper installation torque. The hex flats on the outer element are provided for counter-torque, eliminating the need to hold the component or shaft while applying installation torque.

Note: At full installation torque, the assembly will have moved approximately (±1.9mm) [(±1.1mm) Mini Series] axially along the shaft away from the nut. If axial position is critical it may be necessary to loosen the nut and reposition the assembly.

CAUTION: OVER-TIGHTENING THE NUT COULD DAMAGE THE TRANLOCK UNIT AND/OR THE MOUNTED COMPONENT

| Instalattion Torque on Nut | | |
|---|---|---|
| | Shaft | N-m |
| Mini | 5–6mm | 14.1 |
| | 7–9mm | 17 |
| | 10–12mm | 19.8 |
| | 14–16mm | 22.6 |
| | 17mm | 80 |
| Medium | 15–19mm | 136 |
| | 20–25mm | 170 |
| | 28–32mm | 225 |
| | 34–38mm | 260 |
| | 40–42mm | 316 |
| | 45–50mm | 554 |
| Large | 55mm | 600 |
| | 60mm | 635 |
| | 65–70mm | 680 |
| | 75mm | 750 |

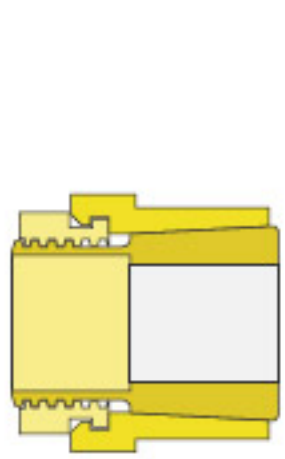


Figure 1

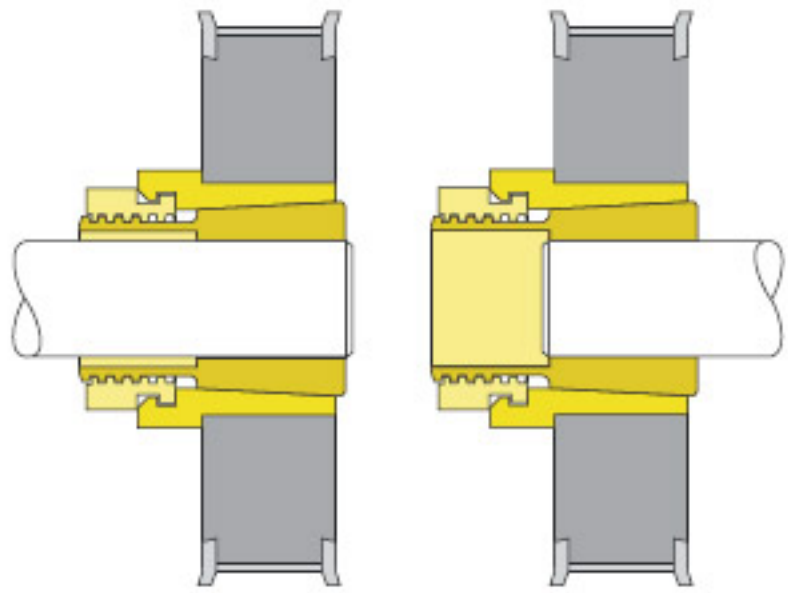
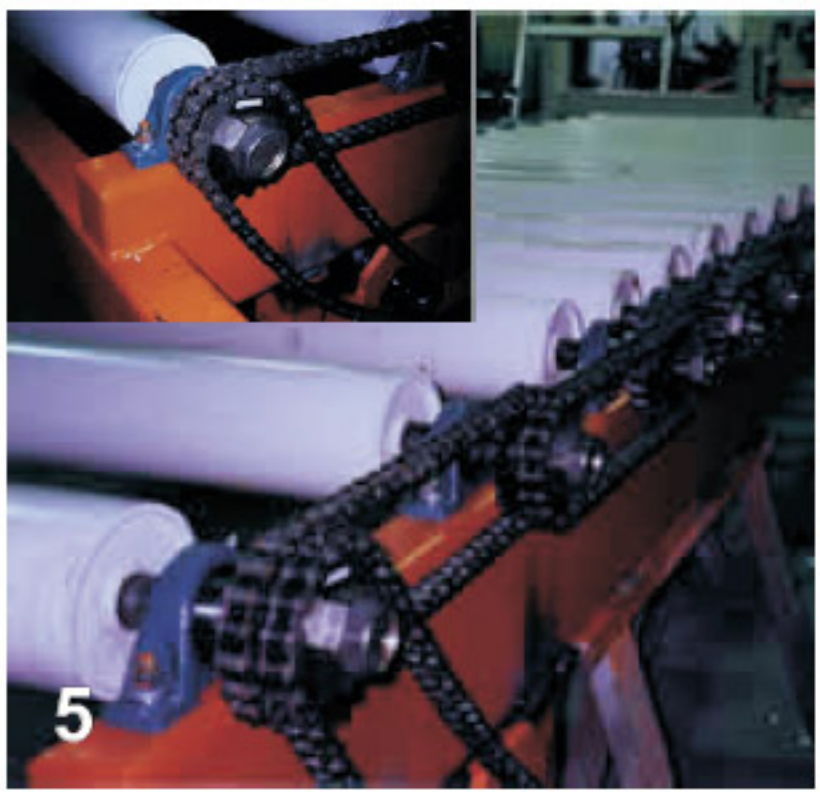


Figure 2

# 6L... Tranlock









1 Sprocket Application
2 Pulley Application
3 Conveyor Drum Application
4 Roller Pulley Application
5 Roller Sprocket Application
6 Fan Application