

# Trantorque® Keyless Bushings

## *Installation Instructions for Trantorque Keyless Bushings*

A Trantorque Keyless Bushing offers flexible and easy installation while providing exceptional holding power. Referring to the series, please follow these Installation Instructions carefully to ensure proper performance of your Trantorque unit.

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T-PR-040

### **Trantorque Mini** . . . . . 3

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T-PR-057

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T-PR-058

**For technical assistance, please call +1-717-665-2421 or email our Applications Engineering Group: [ae@fennerdrives.com](mailto:ae@fennerdrives.com).**

To ensure your Trantorque GT unit performs as specified, be sure to follow these instructions precisely.

**CAUTION: TO PREVENT PREMATURE FAILURE OF THE TRANTORQUE UNIT, SHAFT AND/OR MOUNTED COMPONENT:**

- **Install the product as received. Do not apply lubricants. If supplied lubricated, do not alter. The shaft and mounted component bore must be bare metal (lubricant free).**
- **Do not use impact of any kind to move the Trantorque GT assembly along the shaft.**
- **Torque wrench required.**

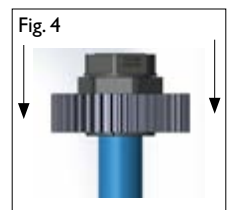
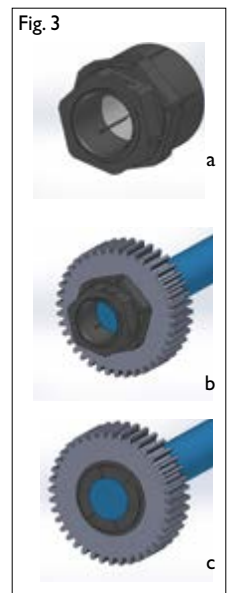
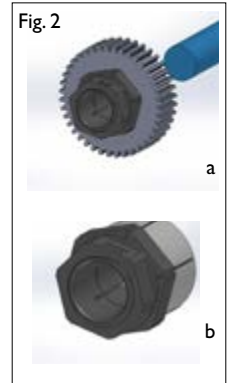
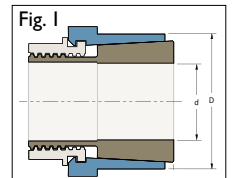
1. The shaft diameter must be within  $\pm 0.003"$  ( $\pm 0.08\text{mm}$ ) of the Trantorque bore, "d" and the mounted component bore must be within  $\pm 0.003"$  ( $\pm 0.08\text{mm}$ ) of the Trantorque outside diameter, "D" (Fig.1). See [www.fennerdrives.com](http://www.fennerdrives.com) for "d" and "D" values.
2. Additionally, both the shaft and mounted component bore must:
  - a. have a surface finish of 32-125 micro-inch (0.8 - 3.2 micro-meter) RMS. If the surface finish is outside of the specified range, it can be roughened using longitudinal abrasion with a bastard file, emery paper or similar to bring surface finish to within specified range.
  - b. be completely free of paint, grease, oil and debris of any kind. Return the surfaces to bare metal and clean using a non-petroleum based solvent (isopropyl alcohol).
3. Insert the Trantorque GT unit into the mounted component making sure the mating hub is flush against the hex flats. (Fig. 2a).
4. Place the mounted component/Trantorque GT assembly onto the shaft. Position it to the desired location making sure the shaft fully engages the Trantorque GT's shaft gripping area (Fig. 3a, lighter area) defined by the stepped bore.

**Warning: THE SHAFT MUST FULLY ENGAGE THE GRIPPING AREA OF THE TRANTORQUE GT (Fig. 3).**

5. Firmly hand tighten the nut (clockwise). Then, using a torque wrench, tighten the nut to the specified installation torque,  $M_a$  (Table 1).

Note: At full installation torque, the assembly will travel approximately 0.075" (1.9mm) axially along the shaft as shown in Fig. 4. If axial position is critical to your application, it may be necessary to loosen the nut and reposition the assembly to compensate for this movement.

**Warning: OVER-TIGHTENING THE NUT COULD RESULT IN DAMAGE TO THE TRANTORQUE GT UNIT AND/OR THE MOUNTED COMPONENT.**



Installation Torque			
Inch		Metric	
Shaft Size	$M_a$ (ft lb)	Shaft Size	$M_a$ (Nm)
$5/8" - 3/4"$	100	15 - 19mm	136
$13/16" - 1"$	125	20 - 25mm	170
$1 1/16" - 1 1/4"$	167	28 - 32mm	225
$1 5/16" - 1 1/2"$	192	34 - 38mm	260
$1 9/16" - 1 3/4"$	234	40 - 42mm	316
$1 13/16" - 2"$	409	45 - 50mm	554
$2 1/16" - 2 1/4"$	442	55mm	600
$2 5/16" - 2 1/2"$	467	60mm	635
$2 9/16" - 2 3/4"$	500	65 - 70mm	680
$2 13/16" - 3"$	550	75mm	750

Table 1

Trantorque GT is covered by US Patent Nos. 5,695,297 & 6,361,243.



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# Trantorque<sup>®</sup> MINI INSTALLATION INSTRUCTIONS

To ensure your Trantorque Mini unit performs as specified, be sure to follow these instructions precisely.

**CAUTION: TO PREVENT PREMATURE FAILURE OF THE TRANTORQUE MINI UNIT, SHAFT AND/OR MOUNTED COMPONENT:**

- **Install the product as received. Do not apply lubricants. If supplied lubricated, do not alter. The shaft and mounted component bore must be bare metal (lubricant free).**
- **Do not use impact of any kind to move the Trantorque Mini assembly along the shaft.**
- **Torque wrench required.**

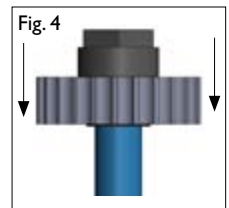
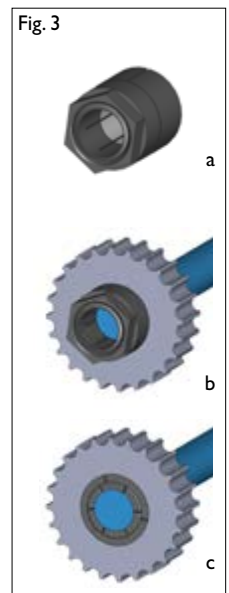
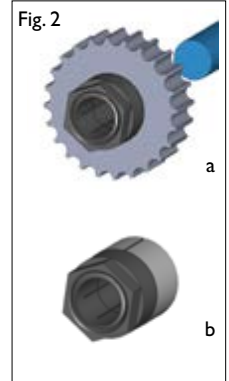
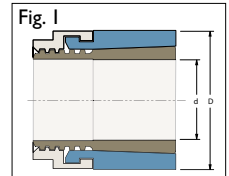
1. The shaft diameter must be within  $\pm 0.0015"$  ( $\pm 0.04\text{mm}$ ) of the Trantorque bore, "d" and the mounted component bore must be within  $\pm 0.0015"$  ( $\pm 0.04\text{mm}$ ) of the Trantorque outside diameter, "D" (Fig. 1). See [www.fennerdrives.com](http://www.fennerdrives.com) for "d" and "D" values.
2. Additionally, both the shaft and mounted component bore must:
  - a. have a surface finish of 32-125 micro-inch (0.8-3.2 micro-meter) RMS. Note: If the surface finish is outside of the specified range, it can be roughened using longitudinal abrasion with a bastard file, emery paper or similar to bring surface finish to within specified range.
  - b. be completely free of paint, grease, oil and debris of any kind. Return the surfaces to bare metal and clean using a non-petroleum based solvent (isopropyl alcohol).
3. Insert the Trantorque Mini unit into the mounted component (Fig. 2a). To achieve peak performance, best practice is to completely cover the gripping area (Fig. 2b, lighter area). Additionally, it is recommended that the mounted component be centered in the gripping area. For long hubs, it is important the hex flats are not covered. Where the length of the mounted component is 75% of the gripping area or less, it is mandatory that the mounted component be positioned in the gripping area.
4. Place the mounted component/Trantorque Mini assembly onto the shaft. Position it to the desired location making sure the shaft fully engages the Trantorque Mini's shaft gripping area (Fig. 3a, lighter area) defined by the stepped bore.

**Warning: THE SHAFT MUST FULLY ENGAGE THE GRIPPING AREA OF THE TRANTORQUE MINI (Fig. 3).**

5. Firmly hand tighten the nut (clockwise). Then, using a torque wrench, tighten the nut to the specified installation torque,  $M_a$  (Table 1).

Note: At full installation torque, the assembly will travel approximately 0.045" (1.1mm) axially along the shaft as shown in Fig. 4. If axial position is critical to your application, it may be necessary to loosen the nut and reposition the assembly to compensate for this movement.

**Warning: OVER-TIGHTENING THE NUT COULD RESULT IN DAMAGE TO THE TRANTORQUE GT UNIT AND/OR THE MOUNTED COMPONENT.**



Installation Torque			
Inch		Metric	
Shaft Size	$M_a$ (in lb)	Shaft Size	$M_a$ (Nm)
1/8 to 1/4	125	3 to 6	14
5/16 to 3/8	250	7 to 9	28
7/16 to 1/2	390	10 to 12	44
9/16 to 5/8	585	14 to 16	66

Table 1



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To ensure your Trantorque OE unit performs as specified, be sure to follow these instructions precisely.

**CAUTION: TO PREVENT PREMATURE FAILURE OF THE TRANTORQUE UNIT, SHAFT AND/OR MOUNTED COMPONENT:**

- Install the product as received. Do not apply lubricants. If supplied lubricated, do not alter. The shaft and mounted component bore must be bare metal (lubricant free).
- Do not use impact of any kind to move the Trantorque OE assembly along the shaft.
- Torque wrench required.

1. The shaft diameter must be within  $\pm 0.003$ " (0.08mm) of the Trantorque bore, "d" and the mounted component bore must be within  $\pm 0.003$ " (0.08mm) of the Trantorque outside diameter, "D" (Fig. 1). See [www.fennerdrives.com](http://www.fennerdrives.com) for "d" and "D" values.
2. Additionally, both the shaft and mounted component bore must:
  - a. have a surface finish of 32-125 micro-inch (0.8-3.2 micro-meter) RMS. Note: If the surface finish is outside of the specified range, it can be roughened using longitudinal abrasion with a bastard file, emery paper or similar to bring surface finish to within specified range.
  - b. be completely free of paint, grease, oil and debris of any kind. Return the surfaces to bare metal and clean using a non-petroleum based solvent (isopropyl alcohol).
3. Insert the Trantorque OE unit into the mounted component (Fig. 2a). To achieve peak performance it is best practice to completely cover the hub gripping area defined by the scribe line (Fig. 2b).

Recommended position for:

- **Short Hubs (where the length of the mounted component is equal to the hub gripping area or less)**  
It is important that the mounted component be positioned in the hub gripping area.  
NOTE: The scribe line can be used to ensure the mounted component is positioned perpendicular to the axis.
- **Long Hubs (where the length of the mounted component exceeds the hub gripping area)**  
It is recommended that the mounted component:
  - First, covers the hub gripping area;
  - Second, extends beyond the scribe line;
  - Third, any remaining length extends beyond the tail of the Trantorque OE.

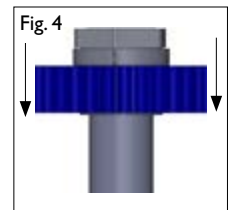
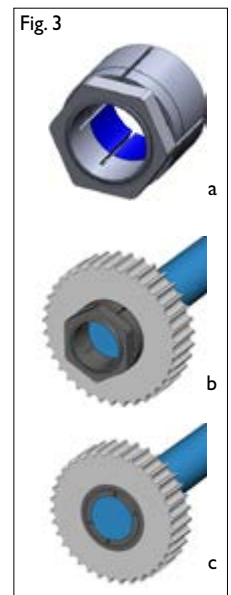
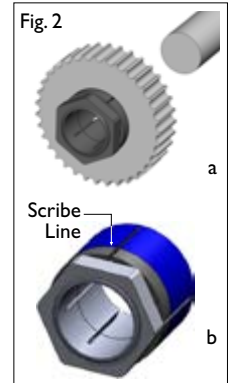
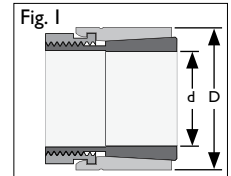
4. Place the mounted component/Trantorque OE assembly onto the shaft. Position it to the desired location making sure the shaft fully engages the Trantorque OE's shaft gripping area (Fig. 3a) defined by the stepped bore.

**Warning: THE SHAFT MUST FULLY ENGAGE THE SHAFT GRIPPING AREA OF THE TRANTORQUE OE (Fig. 3).**

5. Firmly hand tighten the nut (clockwise). Then, using a torque wrench, tighten the nut to the specified installation torque,  $M_a$  (Table 1).

Note: At full installation torque, the assembly will travel approximately 0.075" (0.19mm) axially along the shaft as shown in Fig. 4. If axial position is critical to your application, it may be necessary to loosen the nut and reposition the assembly.

**Warning: OVER-TIGHTENING THE NUT COULD RESULT IN DAMAGE TO THE TRANTORQUE OE UNIT AND/OR THE MOUNTED COMPONENT.**



Installation Torque			
Inch		Metric	
Shaft Size	$M_a$ (ft lb)	Shaft Size	$M_a$ (Nm)
11/16 to 3/4	82	17 to 19	110
13/16 to 7/8	111	20 to 22	150
15/16 to 1	137	24 to 25	185
1-1/16 to 1-1/8	155	28 to 30	240
1-3/16 to 1-1/4	177	32 to 35	265
1-5/16 to 1-1/2	196	—	—

Table 1

This product is covered by US Patent Nos. 5,695,297 & 6,361,243 and EP Patent No. 0925455E



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To ensure your Trantorque NT unit performs as specified, be sure to follow these instructions precisely.

**CAUTION: TO PREVENT PREMATURE FAILURE OF THE TRANTORQUE NT UNIT, SHAFT AND/OR MOUNTED COMPONENT:**

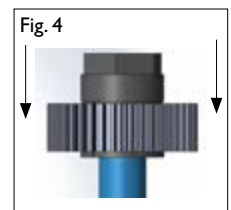
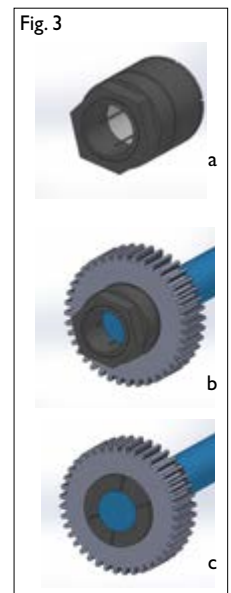
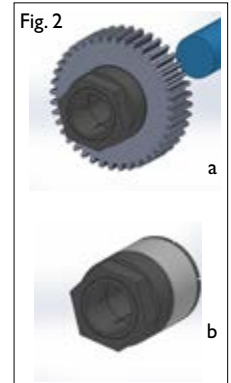
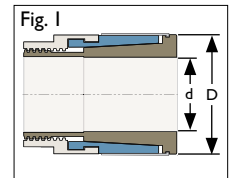
- Install the product as received. Do not apply lubricants. If supplied lubricated, do not alter. The shaft and mounted component bore must be bare metal (lubricant free).
- Do not use impact of any kind to move the Trantorque NT assembly along the shaft.
- Torque wrench required.

1. For part numbers 6980103UP up to and including 6980119UP the shaft diameter ("d") and the mounted component bore (Trantorque outside diameter, "D") must be within  $\pm 0.0015$ " (Fig. 1). For all other part numbers the tolerance is  $\pm 0.003$ ". See [www.fennerdrives.com](http://www.fennerdrives.com) for "d" and "D" values.
2. Additionally, both the shaft and mounted component bore must:
  - a. have a surface finish of 32-125 micro-inch RMS. Note: If the surface finish is outside of the specified range, it can be roughened using longitudinal abrasion with a bastard file, emery paper or similar to bring surface finish to within specified range.
  - b. be completely free of paint, grease, oil and debris of any kind. Return the surfaces to bare metal and clean using a non-petroleum based solvent (isopropyl alcohol).
3. Insert the Trantorque NT unit into the mounted component (Fig. 2a). To achieve peak performance, best practice is to completely cover the gripping area (Fig. 2b, lighter area). Additionally, it is recommended that the mounted component be centered in the gripping area. For long hubs, it is important the hex flats are not covered. Where the length of the mounted component is 75% of the gripping area or less, it is mandatory that the mounted component be positioned in the gripping area.
4. Place the mounted component/Trantorque NT assembly onto the shaft. Position it to the desired location making sure the shaft fully engages the Trantorque NT's shaft gripping area (Fig. 3a, lighter area) defined by the stepped bore.

**Warning: THE SHAFT MUST FULLY ENGAGE THE GRIPPING AREA OF THE TRANTORQUE NT (Fig. 3).**

5. Firmly hand tighten the nut (clockwise). Then, using a torque wrench, tighten the nut to the specified installation torque,  $M_a$  (Table 1).

**Warning: OVER-TIGHTENING THE NUT COULD RESULT IN DAMAGE TO THE TRANTORQUE NT UNIT AND/OR THE MOUNTED COMPONENT.**



Installation Torque	
Inch Shaft Size	$M_a$ (ft lb)
$3/16$ " - $1/4$ "	10.4
$5/16$ " - $3/8$ "	12.5
$7/16$ " - $1/2$ "	14.6
$9/16$ " ; $5/8$ " x 1"	16.7
$3/4$ " x $1 1/4$ "	58
$5/8$ " - $3/4$ " x $1 1/2$ "	100
$13/16$ " - 1"	125
$1 1/16$ " - $1 1/4$ "	167
$1 5/16$ " - $1 1/2$ "	192
$1 9/16$ " - $1 3/4$ "	233
$1 13/16$ " - 2"	408

Table 1

To ensure your Trantorque S unit performs as specified, be sure to follow these instructions precisely.

**CAUTION: TO PREVENT PREMATURE FAILURE OF THE TRANTORQUE S UNIT, SHAFT AND/OR MOUNTED COMPONENT:**

- Install the product as received. Do not apply lubricants. If supplied lubricated, do not alter. The shaft and mounted component bore must be bare metal (lubricant free).
- Do not use impact of any kind to move the Trantorque S assembly along the shaft.
- Torque wrench required.

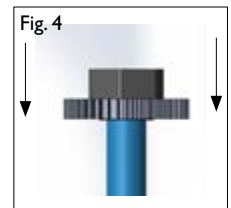
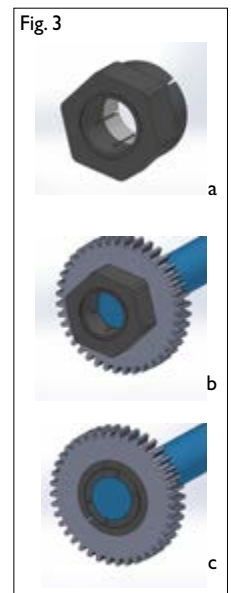
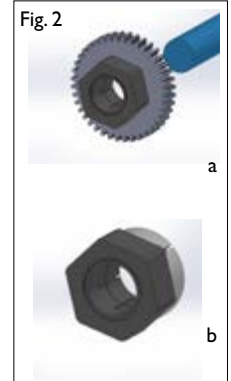
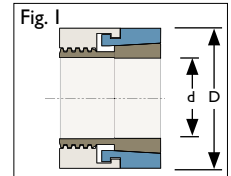
1. For part numbers 6940103UP up to and including 6940119UP the shaft diameter ("d") and the mounted component bore (Trantorque outside diameter, "D") must be within  $\pm 0.0015$ " (Fig. 1). For all other part numbers the tolerance is  $\pm 0.003$ ". See [www.fennerdrives.com](http://www.fennerdrives.com) for "d" and "D" values.
2. Additionally, both the shaft and mounted component bore must:
  - a. have a surface finish of 32-125 micro-inch RMS. Note: If the surface finish is outside of the specified range, it can be roughened using longitudinal abrasion with a bastard file, emery paper or similar to bring surface finish to within specified range.
  - b. be completely free of paint, grease, oil and debris of any kind. Return the surfaces to bare metal and clean using a non-petroleum based solvent (isopropyl alcohol).
3. Insert the Trantorque S unit into the mounted component making sure the mating hub is flush against the hex nut (Fig. 2a).
4. Place the mounted component/Trantorque S assembly onto the shaft. Position it to the desired location making sure the shaft fully engages the Trantorque S's shaft gripping area (Fig. 3a, lighter area) defined by the stepped bore.

**Warning: THE SHAFT MUST FULLY ENGAGE THE SHAFT GRIPPING AREA OF THE TRANTORQUE S (Fig. 3).**

5. Firmly hand tighten the nut (clockwise). Then, using a torque wrench, tighten the nut to the specified installation torque,  $M_a$  (Table 1).

Note: At full installation torque, for part numbers 6940103UP up to and including 6940119UP, the assembly will travel approximately 0.045" axially along the shaft as shown in Fig. 4. For all other part numbers the travel is approximately  $\pm 0.075$ ". If axial position is critical to your application, it may be necessary to loosen the nut and reposition the assembly to compensate for this movement.

**Warning: OVER-TIGHTENING THE NUT COULD RESULT IN DAMAGE TO THE TRANTORQUE S UNIT AND/OR THE MOUNTED COMPONENT.**



Installation Torque	
Inch Shaft Size	$M_a$ (ft lb)
$3/16'' - 1/4''$	10.4
$5/16'' - 3/8''$	12.5
$7/16'' - 1/2''$	14.6
$9/16'' ; 5/8'' \times 1''$	16.7
$3/4'' \times 1 1/4''$	58
$5/8'' - 3/4'' \times 1 1/2''$	100
$13/16'' - 1''$	125
$1 1/16'' - 1 1/4''$	167
$1 5/16'' - 1 1/2''$	192
$1 9/16'' - 1 3/4''$	233

Table 1



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