

**Disclaimer:**

These parts are intended for race use only. The parts are not certified for use on public roads, and as such may not be legal for highway use. Wilhelm Raceworks LLC is not liable for any damage directly or indirectly related to the use or mis-use of these components.

**A note on rod ends:**

This kit replaces several OEM components with rod end spherical bearings. Please be aware that these are wear items, and depending on the conditions of their use may have a shorter lifespan than the OEM components that they replace. They must be inspected periodically for wear or looseness and replaced if necessary.

	<b>FK Part #</b>
Front Tie Rod	JM10T
Front Tie Rod (High Misalignment)	HJMX10T
Rear Tie Rod, Chassis End	JM10T
Rear Tie Rod, Knuckle End	RSML8T

Replacement rod ends can be purchased through any FK rod end dealer (Summit Racing, Jegs, Off Road Warehouse, etc) or through Wilhelm Raceworks, LLC. If you wish to substitute alternate rod ends please contact me for suitable alternatives.

**Parts list:****Front:**

- 2x 1.75" thick front roll center adjusters (RCA)
- 2x Tapered tie rod studs
- 2x Aluminum tie rod spacers
- 2x Tie rod end assemblies
- 4x .2" bump steer spacers (2x with high misalignment option)
- 2x .3" bump steer spacers
- 2x 5/8-18 nylock nuts
- 2x 7/16-20 nylock nuts
- 2x 7/16 lock washers
- 4x M10 x 1.25 x 70mm bolts

**Rear:**

- 2x 1.25" thick rear RCA
- 2x Welded steel rear tie rod brackets
- 2x Rear tie rod press in steel "slugs"
- 2x Rear tie rod assemblies
- 4x Stepped rod end bushings
- 2x 1/2-20 x 2.25" bolts
- 2x 1/2-20 x 3" bolts
- 4x 1/2-20 nylock nuts
- 4x M12 x 1.25 x 60mm bolts
- 8x 1/2" Washers
- 2x 3/16" x 5/8" roll pin

**NOTE:** The hardware is bagged in groups according to its application. Taking note of what parts are bagged together will help determine what parts are installed together.

## Installation Instructions:

A Toyota Factory Service Manual may be helpful to have on hand to reference during the installation process.

### Front:

1. Remove the two bolts holding the ball joint to the knuckle. Install the thicker (1.75") front Roll Center Adjuster (RCA) between the ball joint and the knuckle and secure using the 10mm bolts. Torque to the OEM specification of 59 ft-lb.
2. Break loose - but do not move - the jam nut holding the outer tie rod end to the inner tie rod. Remove the cotter pin and nut from the top of the outer tie rod, and remove the outer tie rod end. A 2 jaw puller or pickle fork may be required.
3. Install the new outer tie rod end to the inner tie rod and torque the jam nut.
4. Install front tie rod stud to the knuckle and secure using the 7/16" lock washer and small Nylock nut. Torque the top nut to 30 ft-lb. You may need to temporarily install the large lower nut to provide a means to hold the stud while installing the top nut.

**DO NOT use an impact gun on the tie rod studs!**

Install large black spacer, .2" bump steer spacer(s), tie rod end, .3" bump steer spacer, and large Nylock nut.

*With the standard front rod end you will use two .2" spacers above the rod end. With the high misalignment rod end option you will only use one.*

5. Torque the bottom Nylock nut to 30ft-lb.

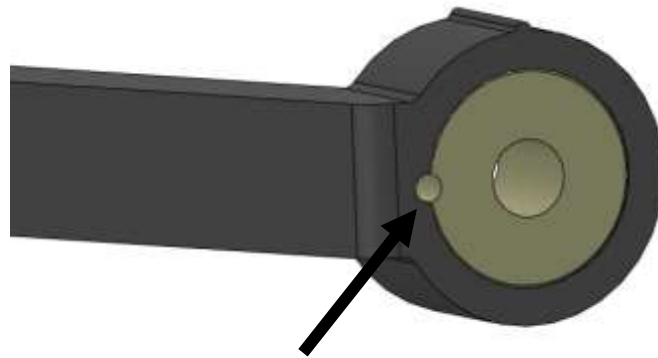


*Front Tie Rod Installation*

## Rear:

**NOTE:** You may be able to accomplish steps 1-3 without removing the knuckle by the use of a 3-jaw puller or ball joint press.

1. Remove the rear knuckle: remove the cotter pin and axle nut. Next, remove the two bolts holding the brake caliper and support the caliper with a zip tie or otherwise so as not to put excessive stress on the brake line. Remove the brake rotor. Loosen the two bolts holding the knuckle to the strut, loosen the two bolts holding the ball joint to the knuckle, and remove the two bolts holding the rear tie rod. Remove the knuckle.
2. Using a press or 3-jaw puller, remove the tie rod spherical bearing from the rear knuckle. If you ever plan to put the stock parts back on it is best to devise some way to press on the bearing outer race only to avoid damage to the bearing.
3. Press in the steel slug to replace the bearing.  
**NOTE:** This must be a secure press fit. If it slips into place without much resistance please contact me.
4. **For extreme usage** (track days or racing with large sticky tires) it may be helpful to pin the slug for additional security. Drill a 3/16" diameter at the joint between the slug and knuckle as shown below and install the provided 3/16" roll pin. If you have questions about this step please contact me. 99% of users can skip this step.



*Hole Location for Slug Pin*

5. Install the rear tie rod drop brackets. The bracket is designed to be a very close fit with the knuckle casting. As a result, it *may* be necessary to ream the holes with a 1/2" drill bit in order to install the bolt. There is also a casting line on the bottom of the knuckle that may need to be ground down. Secure the bracket with the shorter of the 1/2" bolts, 1/2" Nylock nuts, and 1/2" washers under the bolt head and nut. Torque to 80 ft-lb



*Rear Tie Rod Bracket Installation*

Adding a bead of black RTV to the joint between the knuckle and the bracket will help prevent water from collecting in the bottom of the bracket.

6. Reinstall the knuckle (if you removed it earlier). It may be easier to torque all of the bolts at the end of this procedure once everything is attached. Install the rear RCA between the knuckle and the rear ball joint and secure with the four 12mm bolts.



*Rear Tie Rod Installation*

7. Install the rear tie rod as shown in Figure 4 using the stepped bushings and the OEM bolt. Torque to the OEM spec of 76 ft-lb.
8. Insert longer 1/2" bolt through the outer rod end, one of the 1/2" washers, the tie rod bracket, another 1/2" washer, and finally secure with one of the 1/2" Nylock nuts on the forward side. Torque to 40 ft-lb. See Figure 5.



*Rear Tie Rod Installation*

**Note:** The left-hand threaded end of the rear tie rods is marked with notches on both the tie rod and the jam nut.

9. Torque all remaining bolts to OEM specs:
  - Rear ball joint to knuckle bolts: 83 ft-lb.
  - Brake caliper bolts: 43 ft-lb.
  - Knuckle to strut bolts: 188 ft-lb.
  - Axle nut: 137 ft-lb non-turbo axles, 217 ft-lb for turbo axles.

If you have any questions about the installation process please contact me via email at [alex@wilhelmraceworks.com](mailto:alex@wilhelmraceworks.com)