



INSTALLATION MANUAL

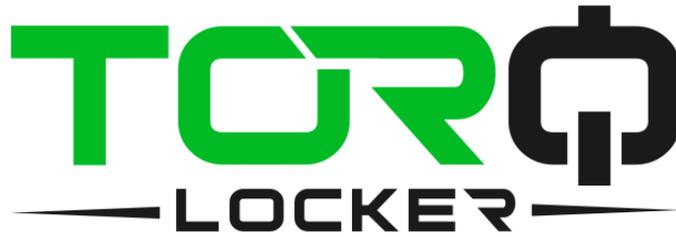
Toyota 8" Clamshell Front Differential

TL-TCS830

TORQ Locker Installation Instructions By:

Made in USA By:





Toyota 8" Clamshell Front Differential

TL-TCS830

INTRODUCTION

We suggest that you read these instructions before beginning your installation to familiarize yourself with the installation steps.

Installation of your new locker is accomplished by removing the differential spider gears from the differential case and installing the TORQ Locker™ components in their place. This type of installation can be made by the weekend mechanic who is familiar with the operation of a differential and who is able to exercise appropriate care during the installation process. Normal installation takes about two to four hours when these instructions are followed. They also assume that the installer has a shop manual covering the vehicle and that they are familiar with the procedures used in removing wheels, axle shafts, etc. Shortcuts should not be attempted unless the installer is very familiar with the shop manual procedures for the vehicle.

Great care has been taken in developing these instructions for the proper installation of the TORQ Locker™; however, the final results are the responsibility of the installer. After the locker is installed, the safe operation of the vehicle is the responsibility of the driver; anyone who drives it should read the Operator's Guide for additional information on how to safely operate your new locker-equipped vehicle.

NOTE: TORQ Locker™ is for Open Differentials Only



TORQ LOCKER™ PARTS LIST

- (2) Cam Gears
- (1) Trail Gear needle bearing replacement
Teflon impregnated and lined sintered bronze
bushing.
- (2) Springs
- (2) Axle Gears

ADDITIONAL PARTS & RECOMMENDED TOOLS

Only reuse the stock components if they are in excellent condition. Visit www.TorqMasters.com for a limited selection of replacement stock components and custom thickness thrust washers if needed.

For your installation, you will need:

- **Stock or aftermarket side gear Thrust Washers**
- **Stock or aftermarket Cross Pin** -- Inspect for wear marks or polish marks, replace if wear is evident. Inspect for metal fatigue, scrape a metal file across the middle of one of the cross shafts. If the file creates a groove, the shaft hardness has fatigued and will need to be replaced. If the file slides and does not cut the metal, the cross pin should be OK to re-use if it is not scored or discolored due to overheating.
- **Gear Oil** – Use OEM recommended oils, or to reduce locker audible ‘click’ use Conventional 85W-140
- **Gasket maker material.**
- **Red Thread Locker 272 or similar**
- **Brake Cleaner**
- **Compressed air**
- **Shop manual for vehicle** – Haynes or Chilton Manuals are sufficient.
- **Digital Caliper, Dial caliper or feeler gauge** – for measuring Locker center gap.
- **Paint pen or Sharpie Marker**

INSTALLATION

- 1.) **Prep vehicle for install:** Engage the parking brake. Place jack stands under your frame because the tires will need to be rotated for testing. Put the transfer case in NEUTRAL to free up the drive shaft so that the differential case can be rotated during assembly. Drain differential of gear oil.



- 2.) Remove the front differential assembly. **Consult your Shop Manual for vehicle specific instructions, this TORQ Locker installation manual does not cover every step to remove and reinstall your differential housing.** Be mindful of your CV joints and axle seals when removing the axles. Remove the front differential assembly including the axle disconnect and tube. Disassemble the front axle disconnect to access the differential side gear inter shaft.
 - a. **The differential side gear inter shaft is difficult to remove.** There are 2 recommended methods:
 - i. Use 2 pry bars to pop the gear out of the case. Do this with the case assembled.
 - ii. Use a thin punch from the opposite side, push past the cross pin and punch out the gear shaft



- 3.) Unbolt the differential cover and remove the differential case.
- 4.) Remove the Cross Shaft, existing differential gears and thrust washers. Remove your Ring Gear.
Tip: Use a paint pen to make index marks on the ring gear to differential case. For reassembly align all index marks. No need to setup the Ring and Pinion backlash.
- 5.) **Prep TORQ Locker for Install:** Apply medium grease, in a very thin coating, to the teeth of the gears and to the backs of the axle gears.



- 6.) **Thrust Washers:** Install new or existing thrust washers onto the backs of the axle gears and press them into the grease to help hold them in place. Most customers can re-use their existing thrust washers. If the differential case is worn or out of tolerance you may need thicker or thinner thrust washers. Contact Info@Torqmasters.com if your center gap measurement is out of tolerance – more on this later in the manual.
- 7.) **Install Axle 2 Gears:** with Thrust Washers on the backs of the axle gears, install driver and passenger side. Hold the upper Axle Gear with one hand.



- 8.) **Install First Cam Gear:** on the bottom axle gear. Let gravity hold it in place. Notice the orientation of the bosses and pockets.
- 9.) **Install Second Cam Gear:** positioning it so that its bosses will slip into the opposing pockets. Slide it in past the other axle gear until they are flush with each other.



NOTE: The springs are firm. Place the spring in the bottom of the pocket, then use a small flat head screwdriver to compress the spring and pop it into the top pocket.

10.) **Install the Two Springs:** rotate the locker assembly and install the two springs into the Spring Pockets.



11.) **Reinstall the Cross Pin and Roll Pin** Use a punch to reinstall the roll pin

12.) **Check the Center Gap Measurement:** Use your caliper or feeler gauges to measure the gap between the two cam gears with the locker teeth engaged. This is an installation check to see if the thrust washers were installed or to see if the differential case is within average machining tolerances or if it has become worn. If the gap is out of specifications, please contact Customer Support: Info@TorqMasters.com

NOTE: Center Gap Spacing = Between 0.145" and 0.175"



13.) **Reinstall the Ring Gear:** Use brake cleaner to clean the ring gear bolt holes in the ring gear. Use brake cleaner to clean ring gear bolts. Use compressed air to remove any remaining brake cleaner or thread locker from bolts and bolt holes. Apply red thread locker 272 or similar to the ring gear bolts. Red thread locker 272 is designed for use in gear oil environments, resists vibration and resists high temperatures. Line up the index mark on the ring gear and case. Tap the ring gear into place with a dead blow hammer. Start the ring gear bolts by hand. Torque the ring gear bolts according to your vehicle manual.

14.) **Remove the OEM Needle Bearing and Install the Trail Gear Teflon Infused Bronze Bushing:** Remove and replace the drivers side (axle shaft side, not front axle disconnect side) needle bearing. Install the new bushing with the steel side out, this will protect the bushing as you drive it in. Install the bushing so it is flush with the case, do not push it in further than the case face. We include this bushing in the kit to ensure proper locker performance. The OEM needle bearing allows for excessive movement in the drivers side axle shaft which can negatively affect TORQ locker operation. This bushing is a wear item. If you have already eliminated your OEM needle bearing it's best to replace your existing bronze bushing with the new one provided in the kit.

- 15.) **Reassemble the Differential:** Place the differential case with ring gear inside the differential housing. Clean the mating surfaces of the clamshell halves, scrape off any existing gasket, clean with brake cleaner and wipe down. Apply gasket maker around one half of the differential clamshell, make sure it's a continuous bead. Align the other half of the clamshell and bolt the diff cover on. Torque according to the vehicle manual specifications.
- 16.) **Reassemble the Front Axle Disconnect:** Reference your vehicle manual. Reinstall the differential side gear inter shaft. Align the shaft in the locker axle gear and hit it with a dead blow hammer until it is fully seated and has touched the cross pin inside the differential. Note: Reinstallation of the gear shaft takes effort. Reinstall the oil seal. Reinstall the front axle disconnect by aligning it with the gear shaft. Bolt everything back together once fully seated.
- 17.) **Complete Installation:** Reinstall the differential assembly into the vehicle. Add gear oil, refer to your vehicle manual for volume of gear oil. Fill with your OEM recommended oil, or for less 'Click' noise use Conventional 85W-140.
***** Note:** Best practice is to wait 24 hours before adding gear oil. This will allow the red thread locker and gasket maker to cure properly. Follow manufacturer's instructions.
- 18.) **Perform the 'Spin Test':**
- a. Jack the front or rear of the vehicle up and place on jack stands so tires are off the ground. Ensure the vehicle is stable.
 - b. Place the vehicle in Park for automatic transmissions. Place the vehicle in gear for manual transmissions. Shift into 4wd to lock the front pinion for the Spin Test.
 - c. Tires must be installed to complete this test.
 - d. Rotate the Drivers side tire forward until it stops against the locked drive shaft. Hold it in position and maintain moderate pressure.
 - e. Rotate the Passenger side tire backwards. It should ratchet smoothly, with the locker clicking as the tire rotates.
 - f. Next rotate the Drivers side tire backwards until it stops against the locked drive shaft. Hold it in position and maintain moderate pressure.
 - g. Then, rotate the Passenger side tire forwards. It should ratchet smoothly, with the locker clicking as the tire rotates.
 - h. Repeat steps a-g this time starting with the Passenger side tire
 - i. If your locker ratchets smoothly, then you have passed the "wheel spin" test and you are ready to finish up.
 - j. Any questions? Shoot us an email or give us a call. Info@torqmasters.com

TEST DRIVE

- 1.) After your installation is complete and you have passed the 'Spin Test' it's time to take your vehicle out for a test drive. Consult the Operator's Guide for detailed information on how to operate your vehicle on and off road.
- 2.) During your initial testing, take it easy the first few miles. Remember that a new rear locker-equipped vehicle will have some different handling characteristics that you will quickly adapt to. Take turns slowly and coast through the turn in rear-locker applications. Front locker applications should see no change in handling characteristics while in 2WD. It is not recommended to test a front locker in 4WD on dry pavement.
- 3.) Try your locker on a low-traction surface like a gravel parking lot to feel how the added traction feels.
- 4.) Note, there is a break-in period for your locker of about 600 miles after which the 'Click' noise should reduce slightly. The occasional 'Clunk' may be heard with this style of locker and should not be cause for concern.

NOTES & HELPFUL HINTS

- **Axle Seals:** Inspect while you are in the differential, now would be a good time to replace if needed
- **Differential case and bearings:** If there are any chips or cracks in the case, and/or the bearings are worn, replace them—but remember that the ring and pinion backlash and bearing pre-load will need to be set up again after replacing.

WARRANTY

TORQ Locker™ FOUR YEAR LIMITED WARRANTY

Torq-Masters Industries warrants each new TORQ Locker™ to be free from defects in material and workmanship under normal use and service following the date of purchase of the part for a period of four years. This warranty is limited to the manufacturer's repair or replacement of the defective parts only, providing the product, including all components and parts, is returned to the manufacturer or its authorized representative, together with proof of purchase and all relevant documentation, transportation charges prepaid. This warranty excludes labor or consequential damages or injury. The decision as to whether the defective part is to be repaired or replaced will rest solely with Torq-Masters Industries, Inc.

Any failure of the product as before described must be reported to the manufacturer within fifteen (15) days of failure and an authorization code number obtained for return of the product to manufacturer or its authorized representative. Proper proof of purchase must be furnished in order to obtain an authorization code; and this code number must be included with the relevant paperwork before mentioned. Please contact us to obtain a return authorization code.

Notes:

This warranty is in lieu of all other warranties express or implied and all other obligations or liabilities on the part of the manufacturer. The manufacturer neither assumes nor authorizes any other entity or person to assume for it any other liability in connection and sale of TORQ Lockers™

This warranty covers the original purchaser only. This warranty does not cover defects caused by any of the following: modification, alteration, repair or service of the product by anyone other than by the manufacturer or its authorized representative, physical abuse to or misuse of the product, improper diagnosis, installation or operation thereof in a manner contrary to the installation manual accompanying the product, and road, offroad or accident damage. No repair or replacement of any part made under this warranty shall be deemed to alter or extend the term of the warranty in any way.

The manufacturer disclaims any implied warranties of merchantability of the goods or fitness of the goods for any purpose. The manufacturer has no liability for incidental, consequential or special damages including, but not limited to, claims of personal injury or property damage and claims of liabilities by third parties not the original purchaser to the product. While this warranty gives specific legal rights, some States have special laws regarding warranties which regulate limitation and time periods. These rights vary from state to state and purchaser is urged to review laws of his jurisdiction in the event of a warranty question.

If the purchaser disagrees with any of the terms of this warranty, please return the purchased item to Torq-Masters Industries, Inc. within three (5) business days of notification of shipment. Buyer is responsible for all shipping charges for receipt and return of product. A decision by the purchaser to retain the item purchased will be deemed acceptance of the specific terms of this warranty.

*** Note, for part number TL-TCS830 there is a 1 year warranty on the Trail Gear needle bearing replacement Teflon impregnated and lined sintered bronze bushing.

TORQ Locker™ is 100% made in the USA.

Please direct any questions to: info@torqmasters.com

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