

TERAFLEX

***Heavy Duty Replacement Axle
Housings for the Jeep Wrangler JK***

TERA
30



TERA
44



Features and Benefits

TeraFlex manufactures and sells many different configurations of the Tera30 and Tera44 HD JK Replacement front axle housings. To help assist you in choosing a housing that will fit your needs, this guide will answer many frequently asked questions regarding different housing configurations and installation requirements.

The factory JK front axle housing has proven itself to be insufficient for a lifted Jeep on larger than stock tires. TeraFlex JK Heavy Duty Replacement Housings address all the inherent weaknesses in the factory housing. Each TeraFlex Heavy Duty Replacement Housing has a 12 month, unlimited mileage warranty to be free from defects.

TeraFlex offers three different replacement housings with several different configurations of each housing.

1. The **Tera30** is a **direct replacement** for a JK Dana 30 housing. All shafts, gears and carriers for the JK Dana 30 are compatible.
2. The **R44** is a **direct replacement** for a JK Rubicon housing. It reuses the factory locker or other aftermarket replacement lockers that fit in the factory housing.
3. The **TF44** is a replacement housing that uses a standard Dana 44 carrier while maintaining the larger JK Front Rubicon Dana 44 gear set. Factory Rubicon inner axle shafts are not compatible with this housing (see page 8 for more information).

All TeraFlex Heavy Duty Replacement Housings feature the following:

- Hand built in the USA! Each housing is carefully inspected, hand built and welded in house
- Ductile iron center section with increased rib gusseting for greater housing stiffness
- Integrated upper control arm mount
- Smooth radius bottom to glide over obstacles
- Asymmetric housing design for an increased resistance to long side tube deflection
- Bottom oil drain hole for a no hassle drain and fill
- Forged Inner Knuckles that have increased strength in both the lower and upper sections
- 3.25" OD x ¼" thick 1026 DOM axle tubes for increased strength without the added weight of smaller, thicker wall tube
- Stamped spring perches to minimize spring bow and feature threaded inserts for limit strap, bump stop extension and spring retainer installation
- ¼" thick CNC laser cut and bent brackets for extreme strength
- Reinforced front track bar mount ties into the spring perch for additional side load strength
- Lower control arm mounts with integrated skid plates that feature 2 holes for fine tuning suspension geometry
- Elimination of slotted lower control arm mount holes provide added strength and reliability - Adjustable control arms will provide solid and accurate pinion and caster angle adjustment
- Spring perches feature threaded inserts for bump stop extensions, limit strap attachment points

and spring retainers

- Heavy Duty ductile iron diff cover
- Pre-installed axle seals and upper control arm bushings
- Direct bolt in. Does not require modifications to any wiring or switches. Compatible with all factory sensors.
- Does not require drive shaft modification
- Triple stage powder coat process for superior corrosion resistance

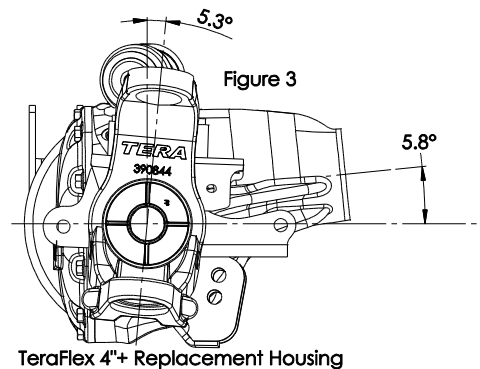
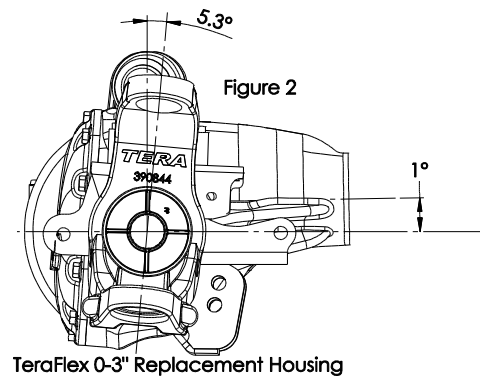
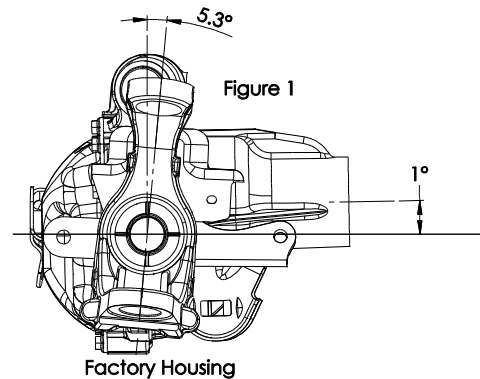
In addition to the features outlined above, TeraFlex also manufactures replacement housings designed to compensate for caster loss and undesirable pinion angle increases associated with taller lifts.

The figure to the right illustrates the difference in pinion angle between a factory housing (Figure 1), a TeraFlex Stock Replacement housing (Figure 2) and a TeraFlex Replacement housing for a JK lifted 4 inches or more (Figure 3). The brackets and knuckles on the 4+ lift housing are set to factory angles; however, the pinion has been rotated up 4.8 degrees to improve the front driveline angle on a lifted JK while maintaining factory caster alignment specs. Caster has a noticeable effect on drivability. Reducing the driveline angle will greatly increase the life of the Rzeppa CV joint in the factory driveline. An upgraded aftermarket driveline is usually not required with a TeraFlex Replacement housing.

Adjustable upper control arms that can be extended are necessary to set the pinion and caster angle correctly with this configuration (Notice how the control arm mount is further forward due to the raised pinion angle on the 4"+ housing in Figure 3).

Additionally, TeraFlex 4"+ Replacement housings feature a track bar bracket with multiple mounting holes to allow correct steering geometry when a high steer or drag link flip kit is installed.

Extreme duty housings with 3.25" OD x 1/2" thick 1026 DOM axle tubes are available in the 4"+ configuration in either an R44 or TF44 housing. The Tera30 is not offered with 1/2" wall axle tubes.



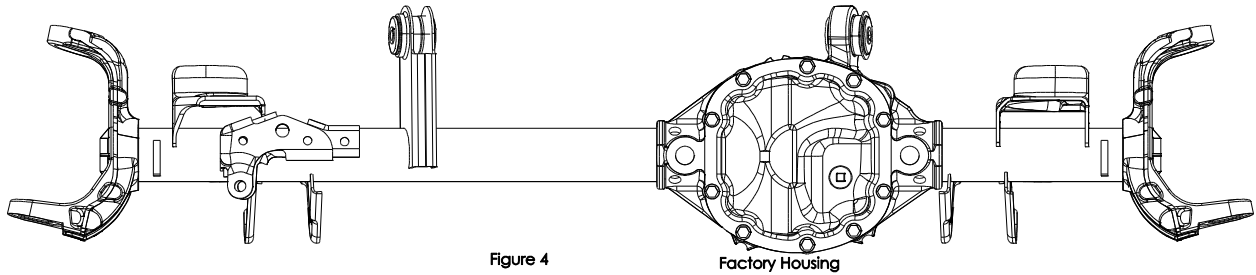


Figure 4

Factory Housing

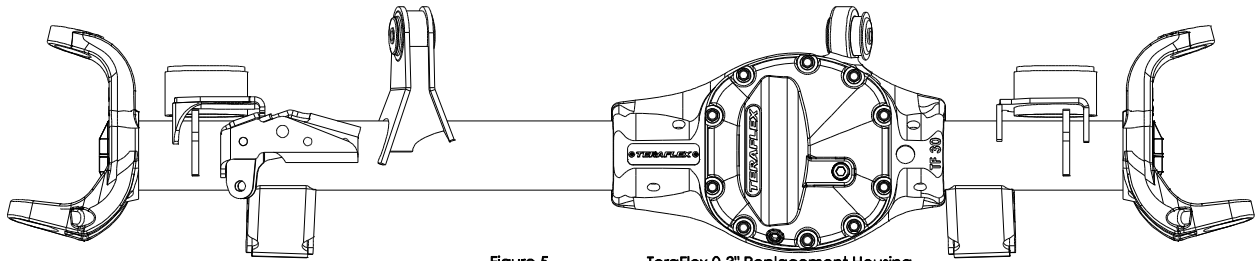


Figure 5

TeraFlex 0-3" Replacement Housing

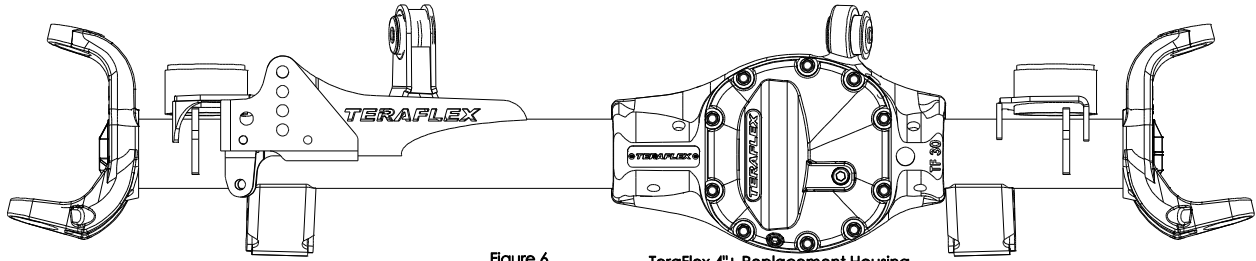


Figure 6

TeraFlex 4"+ Replacement Housing

Figures 4, 5 and 6 above compare the differences between a factory Dana 30 housing and a 0-3" and 4"+ Tera30 housing. The differences between a factory Dana 44 and Tera44 are similar. Figure 7 below illustrates the differences between a factory axle tube and the tube sizes available with a TeraFlex HD Replacement Housing.

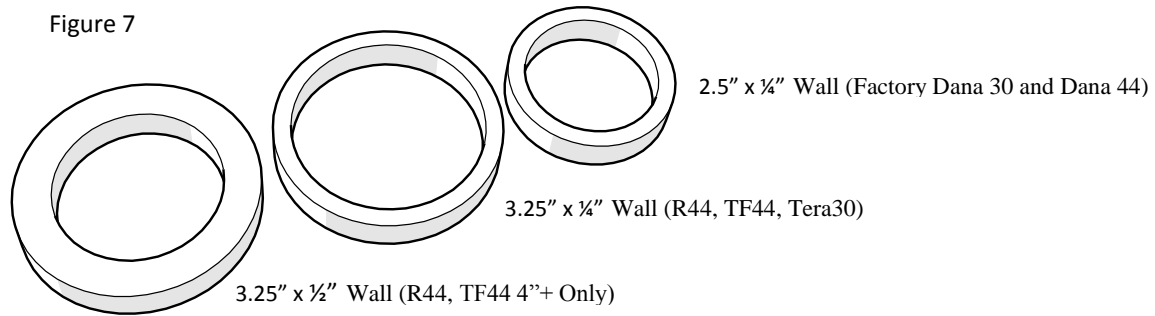


Figure 7

2.5" x ¼" Wall (Factory Dana 30 and Dana 44)

3.25" x ¼" Wall (R44, TF44, Tera30)

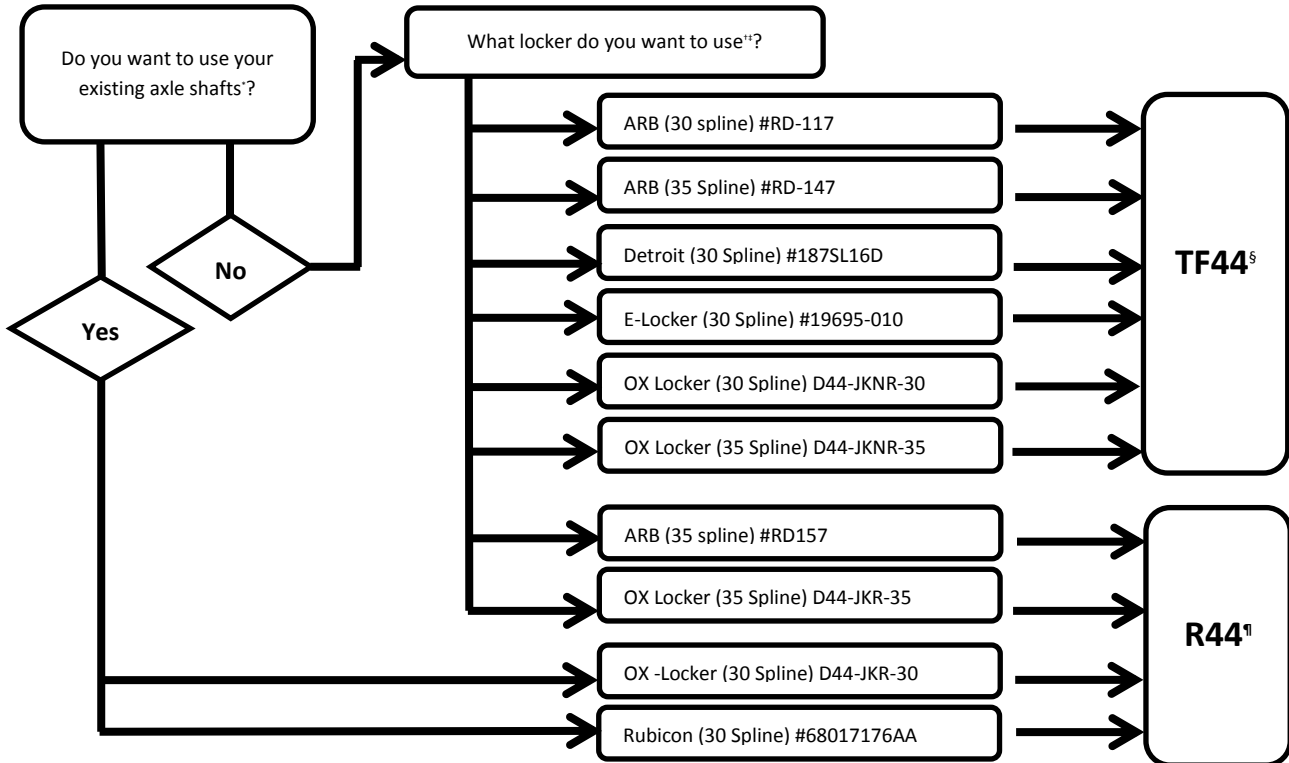
3.25" x ½" Wall (R44, TF44 4"+ Only)

Which Replacement Housing is right for you?

Even with every option imaginable, choosing the correct housing for your application is a simple task. Refer to the **Which housing should you order for your TeraFlex HD44 Front Axle** flow chart for aid in the decision making process. After you have determined which housing (Tera30, R44 or TF44) choose your part number based on lift height, left hand or right hand drive and desired tube thickness. Use Table 1 on the next page.

Note: A 0-3" lift housing can be installed in a JK with more than 3" of lift. The same pinion angle and caster angle issues will exist as with the factory housing.

Which housing should you order for your TeraFlex Tera44 Front Axle



***Axle Shafts:** The Rubicon locker differential pinion shaft is offset to ring gear side by over 5/8". All of the other lockers (except for an Ox locker) have the differential pinion shaft centered. This is why the OEM axle shafts will not work with an aftermarket locker even if the spline count is correct, one shaft will be too long and the other shaft too short.

***Locker Ratio Split:** The locker catalogs call for a different locker for 3.92 & up gear ratio compared to the 3.73 & down ratios. Always use the 3.73 & Down locker for all ratio regardless of what the catalog says! This is because both the R44 and T44 use the JK ring and pinion set with the thick ring gear.

***Ring Gear Bolts:** The JK ring gears use 7/16" bolts. Some lockers may require you to drill out the ring gear bolt holes to 7/16".

***TF44 Housing:** This Housing uses the JK Ring and Pinion. The bearings are from the JK front Rubicon, **except** the carrier bearings are from a 1996-2006 TJ Rear D44 (Timken# 25590 Cone and 25523 Cup or use the one supplied with the ARB).

***R44 Housing:** The machining for this housing matches the OEM JK front Rubicon housing.
Revised 10.10.2012(BAC)

Table 1: Tera30 and Tera44 Part Numbers

	Part Number	Lift Size	Axle Tube Thickness	Drive
Tera30	3503000	0-3"	¼"	LH
	3503004	4"+	¼"	LH
	3503001	0-3"	¼"	RH
	3503003	4"+	¼"	RH
R44	3544000	0-3"	¼"	LH
	3544004	4"+	¼"	LH
	3544053	4"+	½"	LH
	3544001	0-3"	¼"	RH
	3544003	4"+	¼"	RH
	3544054	4"+	½"	RH
TF44	3504200	0-3"	¼"	LH
	3544204	4"+	¼"	LH
	3544253	4"+	½"	LH
	3544201	0-3"	¼"	RH
	3544203	4"+	¼"	RH
	3544254	4"+	½"	RH

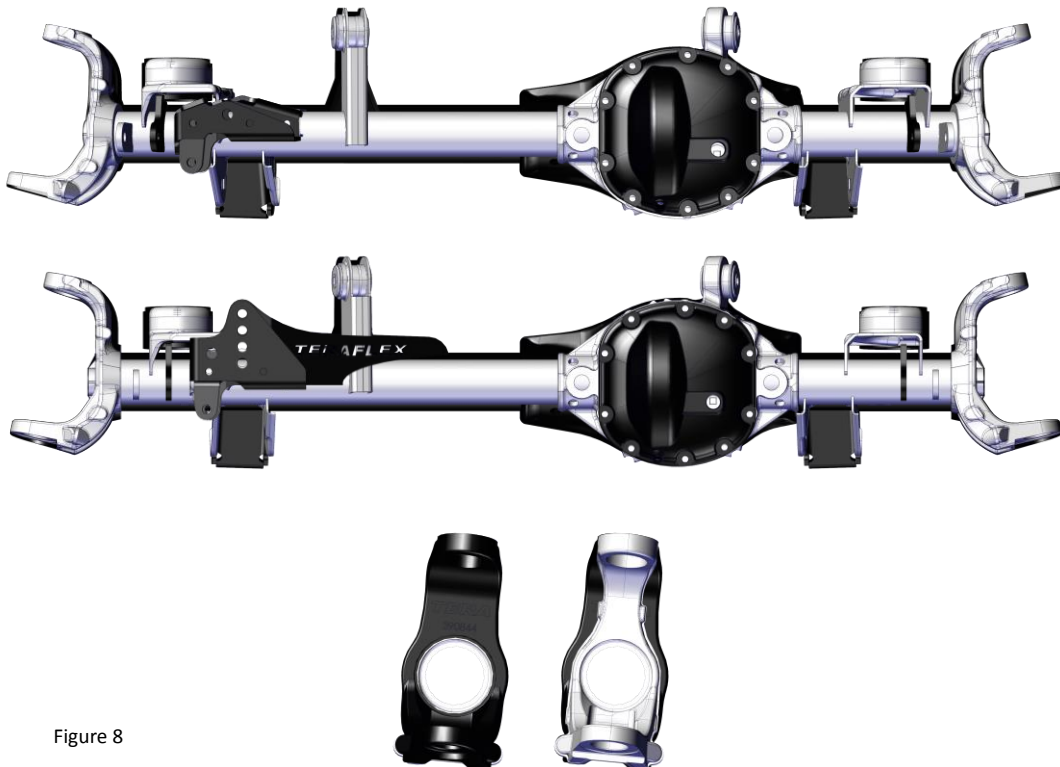


Figure 8

In Figure 8, an OEM Dana 30 housing is overlaid on a Tera30 housing showing the larger axle tubing, more robust center section and forged inner knuckles. The ¼" bracketry matches the factory geometry and the 4"+ lift housing track bar bracket has multiple holes matching factory geometry allowing track bar angle adjustment following installation of a drag link flip kit.

Preparing the Replacement Housing for Installation

When preparing a Tera30 or Tera44 housing for installation into a JK, the factory service manual should be used as a reference for procedure. The ring and pinion setup procedure is the same as a factory axle.

TeraFlex replacement housings do not come with ball joints. It is the responsibility of the installer to either swap the ball joints from the factory housing or install new ball joints.

We recommend installing new ball joints into the replacement housing, unless the ball joints in the factory housing were recently replaced. OEM ball joints have proven to be insufficient with larger tires and off-road use. We recommend installing a set of our JK HD ball joints.

The TeraFlex JK HD ball joints feature hardened 4140 chrome-moly studs. The upper ball joint has two sintered metal bearings to handle the rotational load and maintain correct camber through the most severe terrain. The lower ball joint carries 100% of the vehicle load. The factory ball joint uses a nylon insert for the wear and load bearing surface that leads to early failure in heavy use applications. To accommodate larger tires and heavy offroad use, TeraFlex's HD ball joints use a tool steel wear plate between the 4140 chromoly stud and threaded adjustable wear cup. A knurled ball joint option is available for a "loose" fit ball joint situation. The TeraFlex HD ball joints are compatible with all JK Dana 30 and Dana 44 front axles.

Note: 2013+ factory style axle shafts may require clearancing. Refer to the documentation included with the ball joint kit or at www.teraflex.com. Scan the QR code for a direct link to the technical service bulletin.



Tera30

Any aftermarket locker/traction device designed for a Dana 30 will work in the Tera30 housing. The standard Dana 30 carrier breaks are for 3.55 and down or 3.73 and up ratios. All factory length JK Dana 30 axle shafts will work with this replacement housing. The Tera30 is compatible with JK "Super 30" kits with 30 spline axle shafts.

Scan the QR Codes and follow along with Dennis Wood as he outlines the features and benefits of a TeraFlex Heavy Duty Replacement housing!



Tera30

R44

If you have selected an R44 housing, as noted in the chart on the previous page, there are several locker options that will work with the R44 Rubicon specific **direct replacement** housing.

- **ARB (RD157*)**—Requires aftermarket 35 spline shafts
- **OX (D44-JKR-35)**—Requires aftermarket 35 spline shafts
- **OX (D44-JKR-30)**—Reuse factory or aftermarket 30 spline shafts
- **Factory Locker (68017176AA)**—Reuse factory or aftermarket 30 spline shafts



Tera44

**The design of the RD157 case REQUIRES a differential case spreader for installation. It is not possible to drop in the carrier and shims as you normally would on any other locker installation. The ring gear side bearing journal extends past the bearing and shims after they are installed. To install the locker, load the bearings on the locker, only placing shims on the ring gear side of the carrier. With the case spread, install the carrier and then slide in the shims for the opposing side. Release pressure on the case spreader and check for proper carrier bearing preload to ensure ring and pinion reliability and longevity.*

If the ARB RD157 or OX D44-JKR-35 is installed in the R44 Replacement Housing, TeraFlex's Locker Sensor and Airline Plug kit (**4350550**) is required. This kit will allow an ARB air line without any drilling and tapping. A ¼" NPT plug is also provided to plug the hole entirely when an OX locker is used.

Installing aftermarket 35 spline shafts will require a larger inner axle seal. The preinstalled seals will need to be replaced with TeraFlex part number **360044**. This seal is sold individually. The seal can also be purchased from many auto parts warehouses using part number **SKF15518**.

TF44

The TF44 uses the JK Dana 44 Rubicon front gear set and is compatible with any standard Dana 44 locker/traction device. All JK Dana 44 Rubicon front axle gear sets are "thick cut" so the different ratios will work with the OEM Rubicon locker. If you choose to install a carrier not listed, the carrier **MUST** accept **3.73 and down** ratios. Note that some carriers/lockers may require you to drill out the ring gear bolt holes for the larger 7/16" ring gear bolts used in a JK gear set. The ring gear is hub centric and indexes off the carrier rather than the bolts. Enlarging the bolt holes in the carrier will not be a problem.

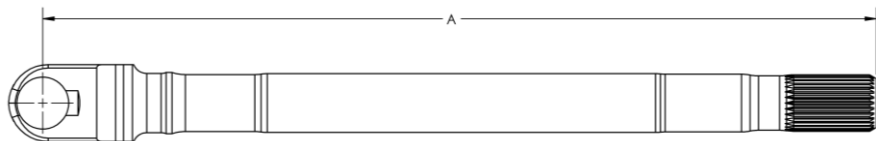
Because standard Dana 44 carriers use different carrier bearings than the JK Rubicon locker, TeraFlex has assembled a master install kit for the TF44 replacement housings. TeraFlex part number **359745** includes all the necessary bearings, shims, and associated parts to set up a ring and pinion in a TF44. This is not included in with the TF44 housing but can be purchased separately.

If you choose to collect your own pinion and carrier bearings, refer to Table 2.

Position	Bearing/Cone Part Number	Race/Cup Part Number	Quantity
Pinion-Inner	M80248	M802011	1
Pinion-Outer	HM88649	HM88610	1
Carrier	25590	25523	2

Shim kits can be purchased separately as well. We recommend Motive Gear part number **1113** for pinion shims (JK Rubicon Front Dana 44) and **1115** for carrier shims when installing a standard Dana 44 carrier in the TF44 housing.

The inner axle shaft length for the TF44 is different than the R44. The cross pin in the factory Rubicon Tru-Lok® differential is offset to the right side, while the standard Dana 44 carrier's pin is centered. There is only about a 5/8" difference in the shaft lengths, but it is enough that a TF44 will not accept a Rubicon inner shaft. TeraFlex sells a set of inner shafts that use the factory 1350 size Rubicon u-joint. Other shafts are also available through various manufacturers. Table 3 outlines some shafts we have found to work with the TF44



Measurements for Inner Axle shafts	A Dimension - Length (inches)	
	Side	
	Left	19.11
	Right	34.19
Manufacturer	Manufacturer Part Number	Description
TeraFlex	3441934	30 Spline Inner axle shaft pair*
RCV Performance	CVJ44-JK-NSC	30 Spline Axle shaft assemblies
RCV Performance	Custom	35 Spline Axle shaft assemblies
Dutchman Motorsports	Custom	30 Spline Inner axle shafts**

*Require 2007-20012 Rubicon or 2013+ Stub shafts with the larger 1350 sized u-joint (will not work with JK Dana 30 stub shafts that use 5-760x or equivalent u-joint)

**Require 2007-2012 JK Dana 30 stub shafts that use 5-760x or equivalent u-joint

replacement housing. It is possible to order a custom shaft from Dutchman Motorsports with the lengths provided in the table. This list is not exhaustive and there may be other axle shaft options available.

If your intent is to immediately run 35 spline axle shafts, we recommend a TF44 Replacement Housing. The TF44 housing is compatible with a wider range of lockers should you ever choose to use a different locker. There is no additional cost between a 35 spline TF44 and a 35 spline R44 because aftermarket axle shafts are required in both cases.

As with the R44, there are several locker options available for those upgrading to 35 spline shafts. Because the shafts are a larger diameter, it will be necessary to install a larger inner axle seal. The preinstalled seals will need to be replaced with TeraFlex part number **360044**. This seal is sold individually. The seal can also be purchased from many auto parts warehouses using part number **SKF15518**.

Installing the Replacement Housing

As with any Jeep modification, it is important to verify function before driving the vehicle. After installing the axle, cycle the suspension to check for housing and component contact. All clearances should be checked at all the extremes the suspension will experience during full articulation and compression. Cycle the suspension with the axle fully installed but without the springs and bump stops. Do not final tighten the track bar and control arm bolts at this time. The tires should be installed to verify fender clearance. The clearances need to be checked at the positions outlined below.

1. **Full Compression**—raise the axle assembly slowly until there is component contact, ie:
 - the axle housing, control arms, track bar or drag link contact either the frame or the engine
 - the tires contact the fenders or other parts of the body
 - the track bar, bolt or frame bracket hits the diff cover or axle housing
2. **Full Droop**—lower the axle assembly slowly until any of the following occurs:
 - the brake lines or ABS wiring are taut
 - the driveshaft contacts the transmission cross member or exhaust on 2012 and newer (good to check on 2011 and older JKs)
 - driveshaft binding at pinion or transfer case
 - shocks at full extension
3. **Articulated Left and Right**—raise one side to full compression, droop the other side and vice versa (be sure to cycle the steering right and left at both extremes):
 - the tire contacts the fender/body, frame or bumper, the shock bottoms out, or the axle housing, track bar or drag link interfere with the frame

Record key measurements at each extreme. You will need to tune your bump stops, and limit straps (not required, but recommended) to prevent damage at the extremes of your suspension's range of travel.

When the axle is in the full compression position, measure the distance between the spring pad on the axle and the metal bump stop cup on the frame. Perform the same measurement when the axle is articulated as described in step three. This measurement will most likely be different. Choose the largest of the three measurements. This is the amount the front bump stops need to be extended. Don't forget to take tire clearance into account.

When the axle is drooped, it is important that the brake lines and ABS wiring are not over extended. If the driveshaft contacts either the transmission cross member or exhaust, it is important to limit the down travel with either a limiting strap or installing a shorter shock. TeraFlex recommends installing a limiting strap to prevent damage to the shock from topping out. The stamped spring perches feature a limit strap mounting point.

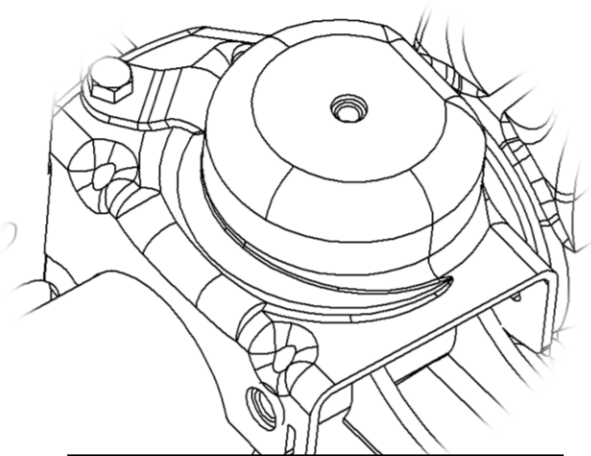
After clearances are verified, install the required bump stop extensions, limit straps and springs. With the Jeep on the ground at ride height torque the track bar and control arm bolts. The track bar and lower control arm bolts should be torqued to 125 ft-lbs (169 N-m) while the front upper control arm bolts should be torqued to 75 ft-lbs (102 N-m). Be sure to route the brake lines and ABS wiring so they will not be damaged as the suspension cycles and springs compress. Adjust the steering stop bolts to bottom out the same time the steering gear reaches the end of its travel, or before either tire contacts the frame, control arm or bumper (whichever happens first).

Fill the differential with quality 80W-90 gear oil.

Align the vehicle and double check the torque on all bolts before test driving. Re-torque all bolts after 100 miles and check torque every 3000 miles thereafter.

Basic Front Axle Installation Checklist:

- Upper and lower control arms
- Track bar
- Sway bar links
 - Torque to 75 ft-lbs
- Tie rod
 - Torque to 63 ft-lbs
- Drag link
 - Torque pitman arm side to 77 ft-lbs
 - Torque axle side to 63 ft-lbs
- Shocks
 - Torque pin to 20 ft-lbs
 - Torque bolt to 56 ft-lbs
- Wheel speed sensors
- Tires and wheels
 - Torque lug nuts to 92-132 ft-lbs
- Cycle suspension to check clearances and measure for bump stops and limit straps
- Bump stops/extensions and limit straps
- Springs and spring retainers
- Torque control arm bolts on the ground
 - Lower control arms to 125 ft-lbs
 - Upper control arms to 75 ft-lbs
- Torque track bar bolts on the ground to 125 ft-lbs
- Set steering stops
- Fill with 80W-90 oil
- Wheel alignment



Stamped spring perches feature threaded inserts for easy limit strap, bump stop extension and coil spring retainer installation

Initial Break-In and Maintenance

Break In

New gear sets and bearings need time to break in. Proper gear break in procedures should be followed to help ensure years of quiet, trouble free operation.

Do not go over 60 mph for the first 100 miles or so. After the first 20 miles, stop and let the differential cool before driving again. This cycle should be repeated a few times. Avoid towing or heavy use for the first 500 miles. When towing a heavy load for the first time, the same 20 mile drive/cool cycle should be followed. Change the oil after 500 miles to remove any metal particles from the initial break in. This is an excellent time to inspect the gear set to catch any potential problems early on.

Maintenance

Wash the axle with a mild car wash detergent to maintain the powder coat finish.

Maintenance parts are available from TeraFlex, any TeraFlex dealers or many major auto parts warehouses. Table 4 contains the list of standard maintenance parts used in TeraFlex Tera30 and Tera44 axle housings.

Table 4: TeraFlex Heavy Duty Axle Housing Maintenance Parts			
Part Description	TeraFlex Part Number	Mopar Part Number	Parts Warehouse Reference Number
Inner Seal (Factory Size Shafts)	12074	5014852AB	-
Inner Seal (35 Spline Shafts)	360044	-	SKF15518
Pinion Seal	13692	68004072AA	722109
Upper Control Arm Bushings	12842	52060138	K200187