Before assembly make sure that your Tera Low231 kit includes:

1- Oil seal (front output)
1- 231 case assembly containing-
   Heavy-Duty Case
   4.0:1 Planetary assembly
   Input shaft bearings
   Input shaft and snap rings
   Vent fitting
1- Automatic Transmission seal extension (Automatics only)
6- studs

Stop! Read this before beginning installation.

Count the input shaft splines & input length from the factory transfer case, and compare it with the new Tera Low231 case to verify that you have the correct case application.

Some older automatics require a transmission seal extension (Part #Tl621). Please check for this part in your kit prior to installation. If it is not included in kit you can order it from your local distributor or from TeraFlex directly at (801) 288-2585.

High RPM Warning
Do not exceed 2500-3000 RPM for sustained periods of time when using the Low231 in low range.
Avoid high engine speeds when using the Low231 in low range in 4th or 5th gear with manual transmissions or with high gear automatics. This is common when driving in snow, mud, or sand. Because the gears are turning 50% faster and with the high gear ratio, it is possible for input speeds to reach 6500 RPM and cause damage to the transfer case.
We recommend using a lower gear in high-range for higher speeds rather than running the Low231 at extreme RPM's.

Break-in Procedure for the Tera Low231
One characteristic of a compound planetary unit, such as the Tera Low231, is the associated gear noise. Following installation of the Low231, you will likely hear noise caused by the gear configuration. This is to be expected of the new gear system and can be reduced by following some simple break-in or adjustment guidelines.
Run the vehicle in low-range. A good day on the trail should be sufficient for the gears to quiet down. Running the vehicle in low-range in a parking lot while accelerating and decelerating will also help quiet the gears.
The planetary gears idle in all positions except low-range. The more low-range use the gears experience, the quieter they become in all positions.
231J Overview
The model 231 transfer case is a part-time transfer case with a built-in low-range reduction gear system. It has three operating ranges, plus a neutral position. The stock transfer case provides a ratio of 2.72:1 for increased low-speed torque capability. The Tera Low231 low-range system provides a low-range reduction ratio of 4.0:1 for even more low-speed torque capability.

Operating Ranges
The 231J transfer case has three operating ranges, which are two-wheel drive high, four-wheel drive high, and four-wheel drive low. The Tera Low231 changes only the four-wheel drive low range. Two-wheel drive range is used for on-road & highway operation. The four-wheel drive ranges are for off-road operation or when the vehicle is driven on paved road surfaces covered by snow, ice or similar low traction elements. The Tera Low231 range is for added low-speed control in extreme terrain.

Shift Mechanism
Transfer case operating ranges are selected with a floor mounted shift lever. The shift lever is connected to the transfer case range lever by an adjustable linkage rod. Range positions are marked on the shift bezel cover plate. The shift mechanism is unchanged with the Tera low231. A synchronizer assembly in the transfer case allows the unit to be shifted between the two and four wheel high ranges while the vehicle is in motion. This is also known as ‘shift on the fly’. Only vehicles with a disconnect front axle have a synchronizer.

Identification
A circular ID tag is attached to the rear case of each model 231 transfer case. The ID tag provides the transfer case model number, assembly number, serial number and low range ratio. The transfer case serial number also represents the date of build. For example, a serial number of 6-13-02 would represent June 13, 2002. The Tera Low231 will fit only NP231 (231J) transfer cases. With NP241, 242, 245, 249, and NV247 modifications to the factory case can be made by arrangement with Tera Manufacturing.

Disassembly
1. Drain the fluid from the transfer case.
2. Remove the front and rear drive shafts.
3. Support the transmission with jack stands.
4. Remove the transfer case from the vehicle. (Refer to the factory manual if additional assistance is needed with this step.)
3. Remove the front yoke.
4. Remove the speedometer gear assembly from the speedometer gear housing.
5. On 84-96 XJs and all YJs, remove the three bolts that connect the tail housing to the speedometer gear housing. Pry the tail housing off, and remove the snap ring. Unbolt the speedometer gear housing from the back half of the transfer case and pry it free.
6. On 97-02 XJs and all TJs, pry the dust shield from the mainshaft. Remove the snap ring and spacer.
7. Pry the oil seal from the speedometer gear housing, and remove another snap ring. Unbolt the speedometer gear housing from the case half and pry it free.
8. Carefully remove the oil pump. Separate it from the strainer, be sure that the O-ring stays in the pump assembly.

**Note:** Remember the order in which the oil pump came off. A common mistake that is made during re-assembly is to install the oil pump on the inside of the transfer case. This is incorrect. This will break off the four mounting tabs on the pump. As the above picture shows the oil pump is installed on the outside of the case, and inside the speedometer gear housing.

9. Remove the bolts attaching the rear case to the front case. Identify the bolts and the washers used at the dowel bolt locations. These bolts are longer and must be placed back in the exact location they came from.

10. Separate the rear case from the front case using screwdrivers. Insert the screwdrivers into the slots cast in the case ends. Then gently pry upward to break the sealer bead and separate the case halves. If the two alignment dowels did not stay in the rear case you should push them in the rear case at this time.

**Caution:** Do not pry against the sealing surfaces of the retainer or rear case. The surfaces could be damaged, resulting in a leaky case.

11. Remove the mode spring (48).

12. Tap the front output shaft (23) upward with a rubber mallet to free it from the front output shaft bearing.

13. Remove the front output shaft (23), drive chain (27) and mainshaft (30) as an assembly.

14. Remove the mode fork and shift rail (47), and the synchro sleeve from the front case as an assembly.

15. Slide the range fork pin out of the slot in the sector (42), remove the range fork (41) and shift hub (13) as an assembly.

16. Remove the shift detent pin, spring, and plug (20).
Note: In step 15 if a 3/4” wrench fits the plug, you will need to acquire the new larger detent parts. The following numbers are OEM Jeep part numbers for the larger pieces.

53008217 Detent pin
53008218 Spring
53008216 Plug
4338956 O-ring

17. Unbolt the range lever from the housing.
18. Slide the shift sector from the case. (42).
19. Remove the sector shaft bushing and O-ring (43) and save them.
20. Remove the shift indicator switch (4). This may be an electric switch or a vacuum switch depending on the year and model of the Jeep. Most Cherokees do not have a switch in the front case. If you are working on a Cherokee disregard this step. Make sure the O-ring seal stays with the switch.
21. Turn the case over and remove the four bolts holding the front bearing retainer cap together.
22. Remove the front bearing retainer cap (2). Carefully pry the retainer loose with a screwdriver in the pry point cast into the retainer.

Note: In step 15 if a 3/4” wrench fits the plug, you will need to acquire the new larger detent parts. The following numbers are OEM Jeep part numbers for the larger pieces.

53008217 Detent pin
53008218 Spring
53008216 Plug
4338956 O-ring

23. Remove the front output oil seal.
24. Remove the bearing snap ring with a flat head screwdriver.
25. Tap the bearing out of the case with a plastic mallet.

Inspection/Preparation

26. Now that all of the needed parts have been removed from the factory transfer case housing, take the new Heavy-Duty Tera Low231 case housing and prepare for assembly.
27. Clean all parts that are going to be re-used thoroughly. Clean all mating surfaces with brake parts cleaner. Inspect all parts for wear. Grease all bearings, seals and O-rings prior to installation to prevent dry-start.
28. Clean the oil strainer carefully. Do not try to clean it by blowing it out with pressurized air. This will force particles deeper into the strainer, and will blow holes in it. Spray it with brake parts cleaner, wiping it occasionally to remove the particles. Repeat this process until it is free of contaminants.

Reassembly

29. Install new studs using double nuts.

Note: A simple way to install the stud is with double nuts. Thread two nuts on a stud and tighten them against each other with a wrench. Repeat procedure for each stud.
30. Using the new Tera front case half install the front output shaft bearing, make sure that it is fully seated. Install the bearing snap ring (21).
31. Install the supplied front output oil seal.
32. Starting from step #23, reverse each procedure back to step #1. On all sealing surfaces use a 1/8” bead of silicone sealant to properly seal the surface.
33. Use the torque specifications chart to tighten bolts to their proper torque rating.
34. When filling the transfer case with oil use DEXRON®III, or higher grade automatic transmission fluid. It is important that the oil level in the transfer case be kept up to the fill plug hole. If you have any transfer case leaks you should fix them before proceeding to drive the vehicle. If the transfer case is driven with inadequate oil the planetary gears will be the first to seize.
35. Drain and replace the transfer case oil after the first one thousand miles, and before three thousand miles.

<table>
<thead>
<tr>
<th>Components</th>
<th>Torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil pump screws</td>
<td>14 in. Lbs</td>
</tr>
<tr>
<td>Yoke nut</td>
<td>110 ft. Lbs</td>
</tr>
<tr>
<td>Vacuum switch</td>
<td>20 ft. Lbs</td>
</tr>
<tr>
<td>Range lever nut</td>
<td>22 ft. Lbs</td>
</tr>
<tr>
<td>Front-case to rear-case bolts</td>
<td>30 ft. Lbs</td>
</tr>
<tr>
<td>Rear retainer bolts</td>
<td>18 ft. Lbs</td>
</tr>
<tr>
<td>Extension housing bolts</td>
<td>30 ft. Lbs</td>
</tr>
<tr>
<td>Drain/fill plugs</td>
<td>35 ft. Lbs</td>
</tr>
<tr>
<td>Detent plug</td>
<td>15 ft. Lbs</td>
</tr>
<tr>
<td>Front bearing retainer bolts</td>
<td>16 ft. Lbs</td>
</tr>
</tbody>
</table>

Revised 07 Dec 2007
Exploded View of the 231J Transfer Case

1. Front input seal
2. Front bearing retainer and seal
3. Tera HD Low231 case
4. Vacuum switch and seal
5. Vent assembly
6. Input gear bearing and snap ring
7. Low-range gear snap ring
8. Input gear retainer
9. Low-range gear thrust washer
10. Input gear
11. Input gear pilot bearing
12. Planetary gear assembly
13. Range fork shift hub
14. Synchro hub snap ring
15. Shim
16. Synchro hub springs
17. Synchro hub and inserts
18. Synchro sleeve
19. Stop ring
20. Shift detent plug, spring, and pin
21. Snap ring
22. Front output shaft bearing
23. Front output shaft
24. Large snap ring
25. Shim
26. Drive sprocket
27. Drive chain
28. Output shaft rear bearing
29. Drive sprocket bearings
   (for YJ style mainshaft)
30. Tera HD Mainshaft
31. Oil seal
32. Oil pump assembly
33. Snap ring
34. Speedometer drive gear
35. Snap ring
36. Front yoke nut
37. Front yoke
38. Front output seal
39. Range fork inserts
40. Range fork
41. Sector
42. O-ring and seal
43. Range lever
44. Range lever nut and washer
45. Mode fork inserts
46. Mode fork and shift rail
47. Mode spring
48. Rear case
49. Rear housing
50. Rear output seal
51. Rear yoke
52. Rear yoke nut

Note: This diagram shows the Tera Low231 Heavy Duty Short Shaft kit, Tera Low231 4.0:1 case, and the Tera Low2WD kit. A stock setup will appear different than pictured.
MAINTENANCE INFORMATION:
It is the buyer’s responsibility to have all suspension, drivetrain, steering, and other components checked for proper tightness and torque after the first 100 miles and every 3000 miles after that.

NOTICE TO INSTALLER:
The enclosed “Warning to Driver” sticker must be installed in the vehicle in driver’s view. This sticker is to act as a constant safety reminder when operating the vehicle. It is your responsibility as the equipment installer to install the provided sticker and to forward the product instructions to the vehicle’s owner for review. If a “Warning to Driver” sticker or product installation guide were not included in the kit, FREE replacement stickers and instructions are available by request. It is the installer’s duty to ensure a safe and controllable vehicle after the modifications have been performed.

WARNING:
Neither the seller nor the manufacturer will be liable for any loss, damage, or injury directly or indirectly arising from the use of or inability to determine the use of these products. Before using, the user shall determine the suitability of the products for its intended use, and the user shall assume all responsibility and risk in connection therewith.

WARNING TO DRIVER:
This vehicle has been modified to enhance off road performance and has unique handling characteristics. Use in harsh environments can cause extreme stress on the components. Vehicle should be inspected after being off road to make sure that all the components are in working order and safe to travel on the highway. All fasteners should be checked so that they are at the correct torque specifications as the vibration and stresses from off roading may cause critical fasteners to work loose. Extra care should be taken to inspect the critical components, steering, and brake systems. During oil change components such as arms, tie rod ends, etc should be greased and checked for excessive wear. Any worn components should be replaced. When returning to the pavement always set or restore tire air pressure to the factory recommendation and connect or engage any abandoned sway bar mechanisms. Because of the higher center of gravity and larger tires, this vehicle handles and reacts differently than many passenger cars, both on and off road. You must drive it safely! Extreme care should be taken to prevent vehicle rollover or loss of control, which can result in serious injury or death. Avoid sudden sharp turns or abrupt maneuverers. Generally, braking performance and capabilities are decreased when significantly larger/heavier tires are used, especially when used in combination with transfer case low-range reduction kits. Take this into consideration while driving. Do not add, alter or fabricate any factory or aftermarket parts to increase vehicle height over the intended height of the TeraFlex product purchased. Mixing component brand is not recommended. TeraFlex Inc. will not be responsible for any altered product or any improper installation or use of our products. We will be happy to answer any questions concerning the design, function, and correct use of our products. It is ultimately the buyer’s responsibility to have all bolts/nuts checked for tightness after the first 100 miles and then every 3000 miles. Wheel alignment, steering system, suspension and drive line systems must be inspected by a qualified professional mechanic at least every 3000 miles.

TERAFLEX PRODUCT WARRANTY:
Tera Manufacturing warrants TeraFlex Suspension products to the original retail purchaser to be free of defects in material and workmanship for as long as the original purchaser owns the vehicle on which products were originally installed. Failure to complete regular maintenance (grease every 3000 miles) on TeraFlex FlexArms will void this warranty. All other conditions of the standard TeraFlex product warranty apply. All TeraLow products are covered by TeraFlex’s two (2) year warranty to be free of defects in material and workmanship for two years from date purchased.

Tera axles are covered by a 12-month warranty to be free of defects in materials and workmanship. This warranty does not cover or include product finish, improperly installed or applied products, improperly maintained products, products or components used for racing or competition or damage due to abuse or neglect, products that fail due to the use of larger tire and wheel combinations. All returns must be accompanied by an original invoice. It is the customer’s responsibility to remove the product from the vehicle. Shipping charges are the responsibility of the customer. Tera Manufacturing will pay the return freight if the product meets the terms of warranty. This warranty is for the replacement or repair of defective TeraFlex products only and does not include freight charges, labor charges for removal of or installation of TeraFlex or related products or components, costs incurred due to down time of the vehicle, or lost profits due to vehicle down time. A returned goods authorization number (RGA#) must accompany any returned products. For more information please contact a TeraFlex customer service representative.

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