Marlin Crawler 4.70 Gear Set Install Guide

Tools Required:

- 12mm, 14mm, and 30mm sockets
- Adjustable wrench
- Ratchet and Breaker Bar
- Regular Hammer
- 3/16 Diameter Pin Punch
- Snap Ring Pliers
- 6mm Allen Wrench
- Gasket Scraper and/or Cleaner
- Access to a Press
- Flat Blade Screwdriver
- Ultra Gray Silicon Permatex #599512
- Bearing Grease or Assembly Lube

Guide Sections:

- Section 1, Parts list and Overview
- Section 2, Disassembly
- Section 3, Reassembly

21 and 23 Spline

The photo to the right shows 21 (left) and 23 (right) spline inputs side by side. Carb and EFI 4cyl Pickup and 4Runners have transmissions with a 21 splne output. V6 and Turbo trucks have transmissions with 23 spline outputs. Both input and output must be the same spline count. For a single transfer case setup choose the gear set that matches the spline count of the transmission you are using. For dual transfer case setup we recommend using stock 2.28 gears in front and 23 spline 4.70 gears in the rear case.

Why mix 21 and 23 spline in the same dual case on 4cyl trucks?

All 4cyl Toyota trucks have the 21 spline output, except for the Turbo 5sp trucks. Many people run dual transfer case setups with 21 spline inputs in both units of a dual transfer case without problems. An even stronger setup is to put a 23 spline gear set in the rear of a dual transfer case. As the motor power comes out of the transmission, the torque is more than doubled when it goes through the first reduction unit of a dual transfer case. This means that torque going to the rear input of a dual transfer case is about double that of the front. If you purchase your gears and dual adapter at the same time, get the 23 spline dual adapter and 23 spline gear set. Using 23 spline components in the rear of a dual case setup is stronger yet costs the same as 21 spline components. If you use a 23 spline gear set in the rear, you must have a dual adapter with a 23 spline coupler. If you purchased a 21 spline dual adapter, you can replace the coupler in order to use it with 23 spline gears.

Section 1: Parts List and Overview

4.70 Gear Kit Parts List

21 or 23 Spline input gear w/bearing
Low range gear
Counter shaft gear w/bearing
Transmission output seal
Rear output seal
Front output seal w/felt and retainer
Shift fork clip
Drain and fill plug gaskets (2)
Complete gasket set (5 pieces)
Marlin Crawler shift knob

During disassembly and reassembly we refer to different transfer case housing sections by number. The photo below shows each of the covers and its number.

Section 2: Disassembly of Transfer Case

As you take apart your transfer case we recommend you label each part as it is removed.

Step 1: Remove 30mm rear nut and flange.

Step 2: Remove 7 bolts and cover #4.

Step 3: Remove 4wd idler shaft bearing outer snap ring.

Step 4: Remove 10 bolts and cover #3.

Step 5: Pull out and remove 2 oil transfer tubes.

Step 6: Remove front drive idler gear.

Step 7: Remove speedo drive gear, lock ball and oil pump gear. Do not loose ball!

Step 8: Remove 63/28N rear main shaft bearing.

Step 9: Shift into 2wd high. Remove 2wd/4wd shift fork roll pin with 3/16" pin punch.

Step 10: Remove 2wd/4wd shift fork and shift collar.

Step 11: Remove front output hub.

Step 12: Remove front output gear.

Step 13: Remove (2) 4wd output gear cage bearings.

Step 14: Remove thrust washer and it's lock ball.

Step 15: Remove front output 30mm nut and flange. Remove 4 bolts. Remove cover #5.

Step 16: Remove front output snap ring.

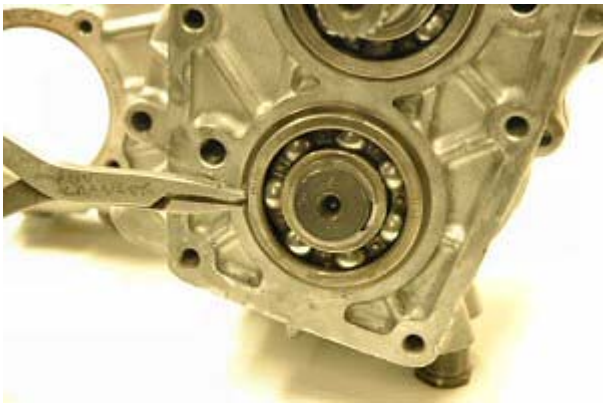
Step 17: Remove front drive output gear.

Step 18: Remove 4 bolts, remove shifter base (top shift) or block off-plate (forward shift) depending on model.

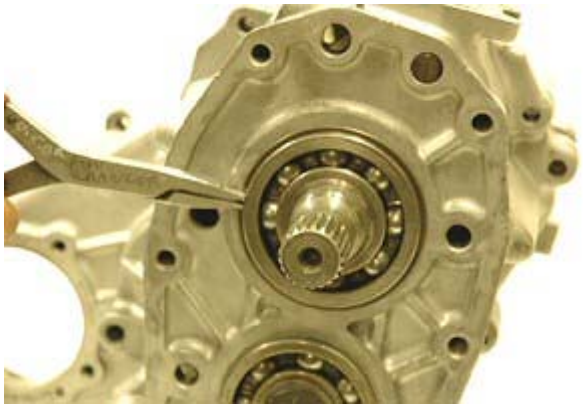
Step 19: Remove 4wd light switch (19mm 1989-1995 or 22mm 1979-1983)

Step 20: Remove detent plug, ball and spring from both sides of upper case. Rotate case on side, then spring and ball will fall out.

Step 21: Remove remaining 4 bolts holding cover #1. Two bolts are located on the front side, two are on the rear side.



Step 22: Remove idler shaft bearing snap ring.



Step 23: Remove input shaft bearing snap ring.

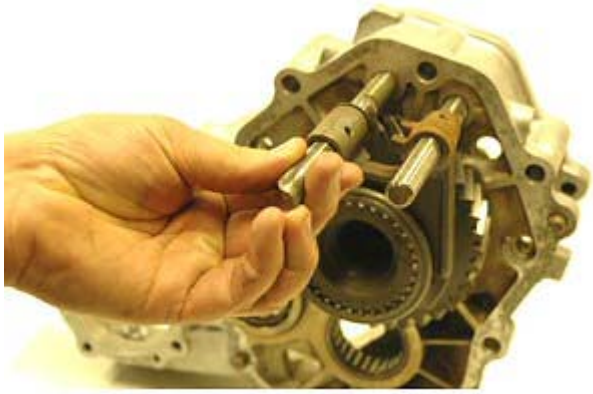
Step 24: Drive out roll pins from both shift rails. Pins will fall to bottom of case.

Step 25: Slide cover #1 forward and remove. Retrieve two shift fork roll pins from bottom of housing.

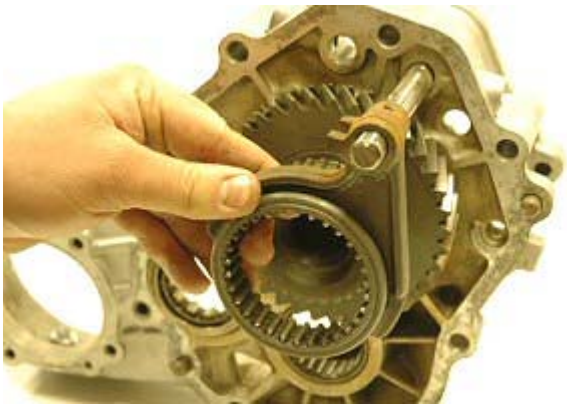
Step 26: Remove input gear.

Step 27: Remove counter shaft gear.

Step 28: Remove pocket bearing from main shaft.



Step 29: Remove 2wd/4wd shift fork.

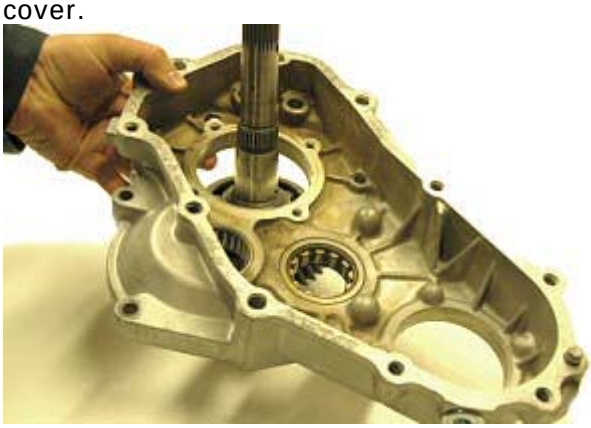


Step 30: Remove hi/lo shift fork and shift collar.

Step 31: Rotate case 90 degrees right, tap case lightly to remove shift fork interlock pin.

Step 32: Remove 4 bolts and main shaft bearing cover.

Step 33: Remove main shaft bearing snap ring.



Step 34: Slide cover #2 off of main shaft.

Step 35: Remove snap ring from main shaft.

Step 36: Remove 6208N main shaft bearing using press or gear puller.

Step 37: Remove thrush washer and lock ball.

Step 38: Remove low speed gear from main shaft.

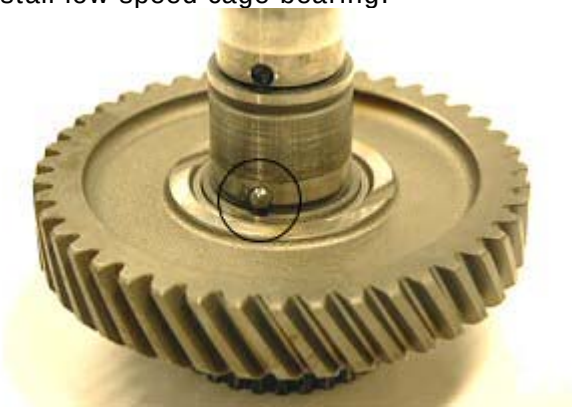
Step 39: Remove main shaft cage bearing.

Step 40: Remove snap rings from input and counter shaft gears above. The remaining parts will not be used during reassembly.

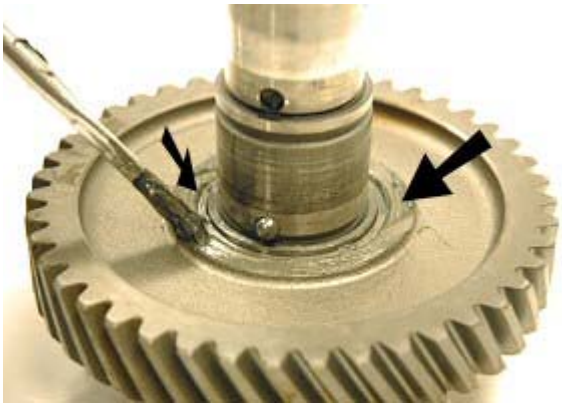
Section 3: Reassembly of Transfer Case

Step 41: Apply grease main shaft race way. Install low speed cage bearing.

Step 42: Install new 4.70 low speed gear onto main shaft.



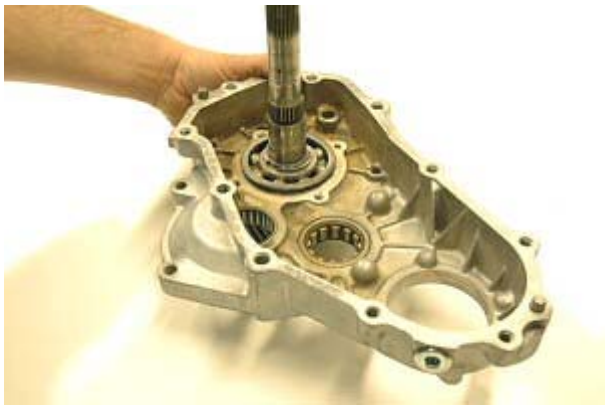
Step 43: Apply grease to the ball hole and insert ball.



Step 44: Apply grease to face of low speed gear as shown above. < >

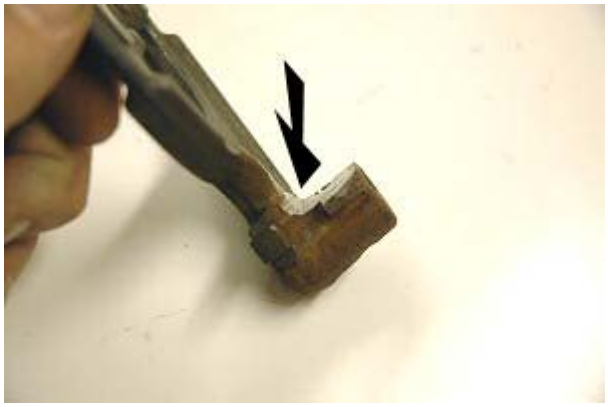
Step 45: Slide thrust washer over main shaft until seated onto face of low speed gear. Line up notch in washer with ball.

Step 46: Slide 6308N bearing onto main shaft. Press bearing until it contacts thrust washer. Install snap ring onto shaft.



Step 47: Slide cover #2 onto main shaft.

Step 48: Install bearing retainer and 4 bolts. Torque to 10 ft/lbs.



Step 49: Using a grinder or file, remove inside radius on shift forks(s).

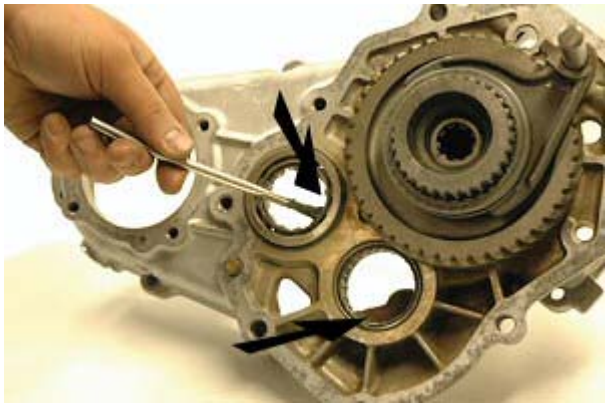
Step 50: Top shift case only. Using a grinder, clearance shift block as shown above.

Step 51: On 79-83 models only, replace C-Clip on 2wd/4wd shift fork with new clip provided in kit. Clip is not used on newer cases

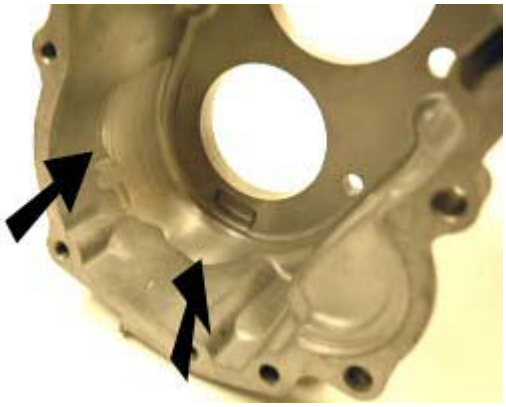
Step 52: Insert roll pin into low range shift fork. Shaft can go in two ways, install as shown above.

Step 53: Install shift rod, high/low fork and clutch sleeve.

Step 54: Grease pocket bearing inside and out. Insert bearing into main shaft.

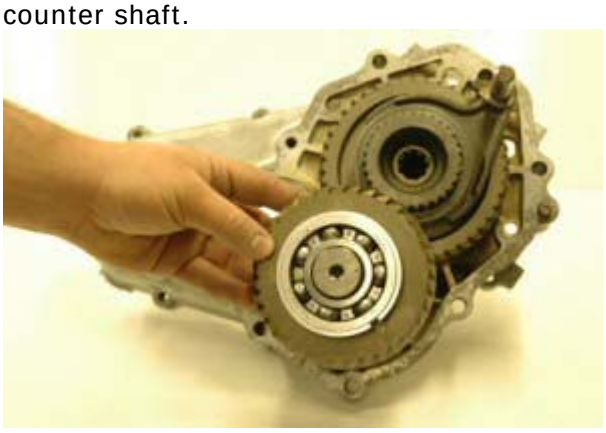


Step 55: Grease both idler and counter shaft bearings as shown.



Step 56: Using end mill or hand grinder clearance case as required to accept new 4.70 counter shaft.

Step 57: Place counter shaft and bearing in clearanced housing. Rotate counter shaft to check for proper clearance. Gear should not contact housing when spun.

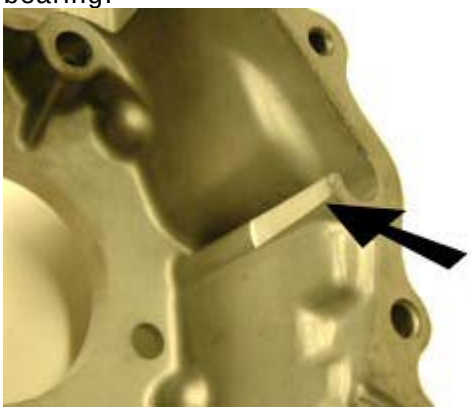


Step 58: Remove counter shaft from cover #1 number and install into cover #2 as shown above.

Step 59: Install input gear in main shaft pocket bearing.

Step 60: Remove snap ring from counter shaft bearing.

Step 61: Also remove snap ring from input gear bearing.



Step 62: Sometimes it is necessary to clearance cover #1 near the input gear as shown. Test fit to see if this is necessary. Clearance up to 1/8" as needed.

Step 63: 79-83 cases only. Install roll pin into shift block. Note position of shift block fingers and shift rod. Assemble as shown above.

Step 64: Place new gasket onto cover #2.

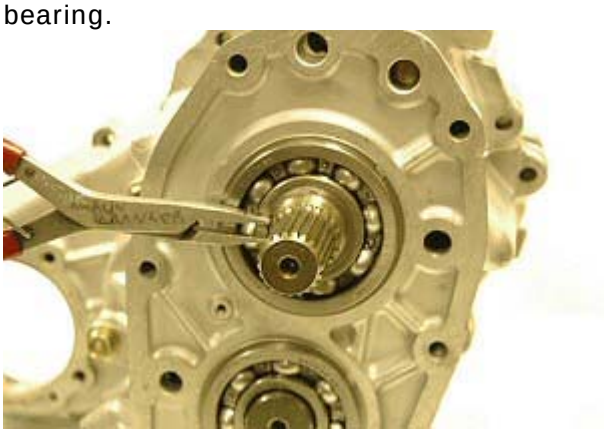
Step 65: Slide cover #1 onto cover #2. Carefully tap cover #1 with hammer until cover #1 seats on cover #2.

Step 66: Loosely install two bolts on front of cover #1. Do not tighten yet.

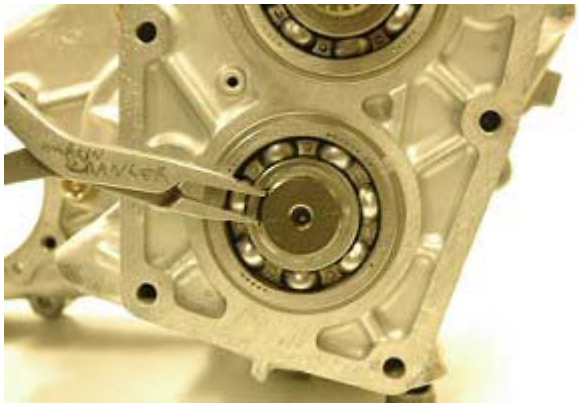
Step 67: Loosely install two bolts on back of cover #1. Do not tighten yet.

Step 68: Install snap ring onto input gear bearing.

Step 69: Install snap ring onto counter shaft bearing.



Step 70: Install inner snap ring onto input gear bearing.



Step 71: Install inner snap ring onto countershaft gear bearing. Push shift rod forward.

Step 72: Insert interlock pin into either detent spring hole. (Skip this step if installing a twin stick) Turn the case on it's side and tap if needed to get pin into place.

Step 73: Make sure the interlock pin is all the way into position. Here is can be seen and is not yet in position. Push the pin in until it can no longer be seen.

Step 74: On 85-88 EFI models only, place pin just far enough into shift block so that you can pick up the block.

Step 75: Use the pin to place shift block into transfer case. Slide shift rail into shift block.

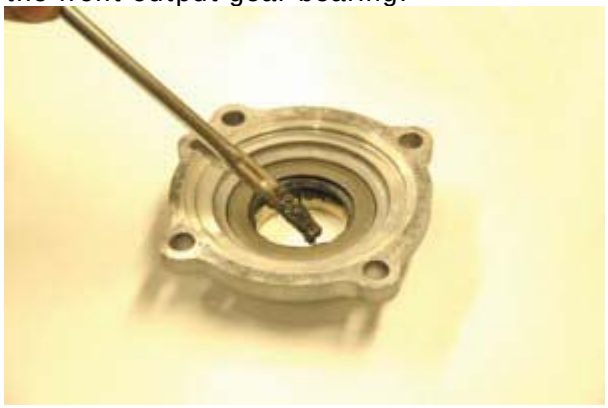
Step 75: Note position of detent notches on 2wd/4wd shift rail.

Step 77: Using a pin punch, drive pin into place.

Step 78: Slide front output gear with bearing into cover #2.

Step 79: Install snap ring around the outside of the front output gear bearing.

Step 80: Light press front output seal felt and retainer into cover #5.



Step 81: Turn over cover #5 and grease inside of rubber seal surface.

Step 82: Place this gasket onto face of cover #2.

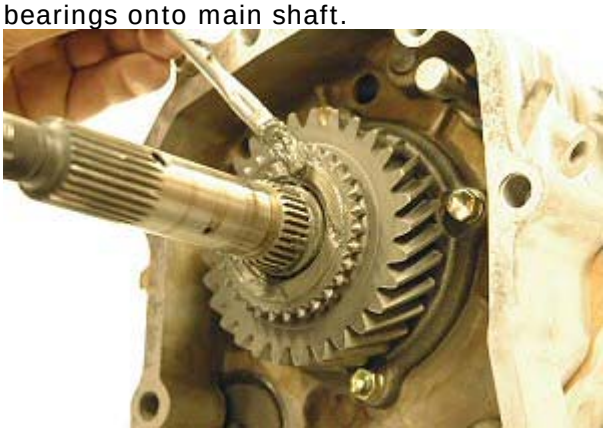
Step 83: Install cover #5 using 4 bolts. Torque to 10 ft/lbs.

Step 84: Apply grease to ball hole on main shaft and place ball in hole.

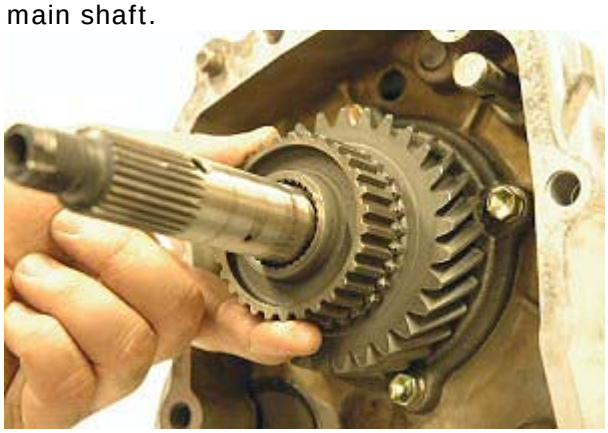
Step 85: Slide thrust washer onto main shaft and over ball. Apply grease to face of thrush washer.

Step 86: Apply grease to inside and outside of both both front drive cage bearings. Slide bearings onto main shaft.

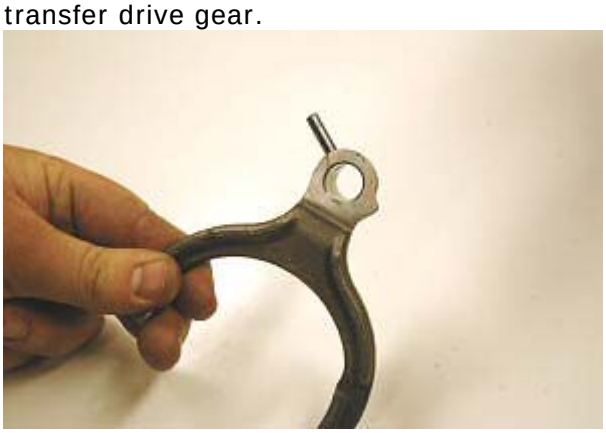
Step 87: Install front transfer drive gear onto main shaft.



Step 88: Apply grease to face of front transfer drive gear.



Step 89: Slide clutch hub onto main shaft.



Step 90: Push roll pin into hi/lo shift fork just far enough so it will not fall out.

Step 91: Install clutch sleeve and shift fork onto 2wd/4wd shift rail.

Step 92: Using a 3/16" pin punch, drive roll pin into shift fork so that it is flush with the fork.

Step 93: Install original front drive idler gear.

Step 94: Install output shaft rear bearing.

Step 95: Slide oil pump drive gear onto main shaft as shown.

Step 96: Apply grease to ball hole and place ball into hole.

Step 97: Slide speedo drive gear onto main shaft.

Step 98: Install oil transfer tubes as shown.

Step 99: Place new gasket onto rear of cover #2.

Step 100: Apply grease to cage bearing in rear of cover #3.

Step 101: Install cover #3 onto the back of cover #2. Be careful to align oil transfer tubes in the cover. Install 10 bolts into cover #3. Torque to 29 ft/lbs.

Step 102: Install snap ring onto idler bearing.

Step 103: Place new gasket onto back of cover #3.

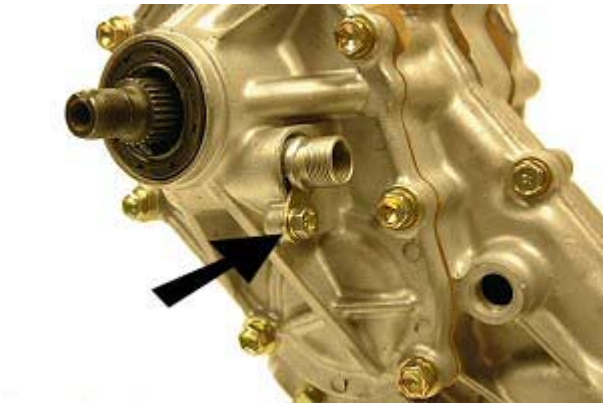
Step 104: Remove speedo lock bolts and tab. Using a screwdriver remove the speedo drive gear from cover #4.

Step 105: Remove old seal and install new seal into cover #4.

Step 106: Install cover #4 onto the back of cover #3. Install 7 bolts into cover #4. Torque to 29 ft/lbs.

Step 107: Apply grease to speedo drive gear.

Step 108: Slide speedo drive gear into cover #4.



Step 109: Install speedo gear lock bolt and tab, torque to 10 ft/lbs.

Step 110: With the case on it's side, drop in one detent ball.

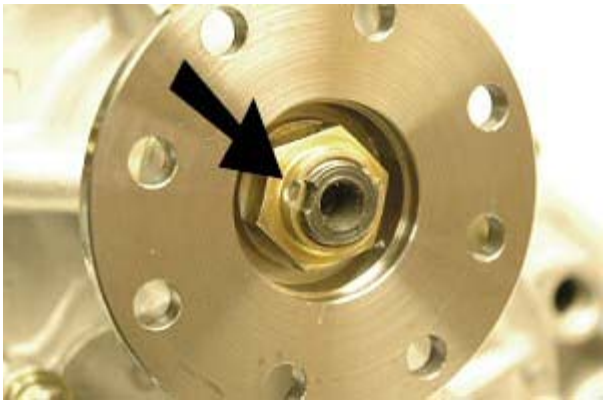
Step 111: Now drop in a detent spring after the ball.

Step 112: Apply silicon to the threads of the detent plug and install. Flip the case over onto the other side and install the ball, spring and plug the same way.

Step 113: Install 4wd shift light switch into cover #1.

Step 114: Apply silicone to the spines inside both flanges.

Step 115: Install flange. Note, the silicone will bulge out just a bit. You should see a slight bulge on each of the splines.



Step 116: Install the main shaft nuts and tighten to 90 ft/lbs. Using punch, drive the stake nut into the main shaft as shown above. Repeat for rear flange.

Step 117: Tighten 4 bolts on cover #1 that were left loose in step #66 & 67. Torque to 29 ft/lbs. Replace drain and fill plug washers with ones provided. Install transfer case into truck. Using the rear fill plug, fill transfer case with 80/90W GL5 gear oil. Do not over fill. No brake in is required for 4.70 gears, we do recommend replacing the oil after the first 1,000 miles and every 30,000 miles thereafter. Conventional or synthetic oil may be used.

Torque Specs:

8 X 1.25mm bolts with 12mm head 10 ft/lbs
10 X 1.25 mm bolts with 14mm head 29 ft/lbs
30mm front and rear flange nuts 90 ft/lbs