

Eaton

Limited Slip Differential After-market Installation

Congratulations! You have just purchase the best limited-slip differential available anywhere in the world, bar none.

This video has been designed to make the installation of your new Eaton differential a smooth and confident operation. Though some detail may vary slightly from one vehicle manufacturer to another, the vehicle used in this video will provide the proper visual aide to demonstrate basic installation operations applicable to all rear axle differential installations.

Preparation

Prior to beginning the installation process, you will need access to the following tools and equipment:

1. Vehicle service manual
2. Vehicle hoist or hydraulic jack and jack-stands
3. Air Impact gun and sockets or equivalent hand tools
4. General socket and wrench sets standard and metric
5. Shop light
6. Oil drain pan
7. Shop towels
8. Gasket scraper
9. Magnetic base dial indicator
10. Mechanics magnet
11. Large pry-bar
12. Drift punch and hammer

13. Hydraulic press
14. Bearing driver
15. Heavy leather or Shot filled rubber hammer
16. Shim driver
17. Torque wrench
18. Flexible funnel

Installation

Step 1

The rear axle wheels must be raised from the ground and the vehicle secured in a safe manner. The use of a vehicle hoist is preferable, however the installation can be accomplished at floor level. **Note: Make sure the vehicle is secured properly with safety stands and the transmission gear selector is in the neutral position.**

Step 2

Remove rear wheels.

Step 3

Remove brake drums if so equipped. If vehicle has rear disc brakes, remove brake calipers and brake rotors.

Step 4

With the use of a drain pan, remove differential cover.

Helpful hint: Leave the top cover bolt loosely engage while prying loose the cover. Fully remove once gear oil has been fully drained. Take note of the type of cover gasket used, as replacement with a similar gasket material is recommended. Scrape and clean cover. **Note: Dispose of waste oil properly.**

Step 5

This is the point at which the actual removal of your old differential begins. If you will be using the same ring and pinion gear set, ring and pinion gear backlash (the movement between the drive pinion and the differential ring gear) is a critical dimension and needs to be measured and maintained at the same setting (typically ~ .010" +/- .002). This measurement can be done with a magnetic base dial indicator). Measure and record this dimension. If you are replacing the ring and pinion gear set at this time, refer to vehicle service manual or ring & pinion manufacturer for applicable procedures.

Step 6

Remove differential pinion shaft, lock screw and remove pinion shaft. Push each axle shaft inward one at a time exposing the axle retaining C-clip. In some cases the clips will simply fall out at this point, in others the clips are kept in place with an O-ring and will need to be removed with a suitable tool. Once the clips are removed, the axle shafts can be pulled outward enough to clear the differential bearing hubs during differential removal. Take care in sliding the axle shafts in and out to prevent damage to the axle shaft bearing and seals.

Step 7

Remove both left and right differential side bearing caps. Be sure to mark or tag them (left/top and right/top) as they will need be reinstalled in their original position and location. Temporarily re-install the differential pinion shaft as shown to assist as a leverage point in removing the differential. Once the pinion shaft is in place as shown, carefully pry the differential assembly outward. Support the assembly with your hand to keep it from falling out. **Note: Do not pry on the ring gear teeth as damage and noise could result.**

Once the differential is free, remove it along with the left and right differential side bearing cups and shims, keeping track of their left and right orientation.

Step 8

Remove ring gear bolts. Note: Some ring gear bolts have left handed threads and need to be removed accordingly in the reverse direction. Once the ring gear bolts have been removed, the ring gear is still pressed on the differential housing pilot diameter and will have to be pressed off or removed using a hammer and drift punch. The punch can be used through the ring gear bolt holes or along the outer edge of the ring gear. Note: some differentials have a speed pick-up ring located between the ring gear and the differential housing flange. Take note of its orientation during removal so that it can be re-installed properly. **Note: Do not strike the speed pick-up ring as it can be easily damaged or broken.**

Step 9

Install new differential side bearings on to the bearing hubs of the differential housing. Prior to pressing the new bearings on to the differential bearing hubs, be sure to wipe clean both surfaces. **Note: Please make sure that the new bearings are fully “seated” against the housing bearing hub shoulder.**

Step 10

Prior to installing the ring gear on to the differential housing flange, be sure to wipe clean the ring gear mounting surface and the housing flange mounting surface. This is to insure that no debris is trapped between the ring gear and flange adversely affecting ring gear backlash. Once clean, align the through holes of the flange with the threaded holes of the ring gear and “start” all of the ring gear bolts in their threads.

The ring gear can either be “drawn” on to the press fit of the housing ring gear pilot diameter by equally and alternately tightening the ring gear bolts, or the ring gear can be fully “pressed on” using a hydraulic press and then fully tightening the ring gear bolts to the proper torque specification afterward. Note: some differentials have a speed pick-up ring located between the ring gear and the differential housing flange. Re-install it in the same orientation as it was removed.

Step 11

Firmly grasp the entire differential assembly that now includes the differential side bearings and ring gear. Add to this the side bearing cups and the side bearing shims (keeping left and right side shims in their proper place). All of these components must be hand pressed in place (as far as possible) in the axle housing, taking care to align side bearing cups and shims properly. The differential assembly can then be firmly seated with the use of a leather or rubber tipped heavy mallet. Once the differential assembly is fully seated, make sure the side bearing shims are fully seated as well, by using a special shim driving tool or a suitable drift punch and hammer. Install right and left differential side bearing caps and tighten bolts to the recommended torque specification.

Step 12

Using a magnetic base dial indicator re-check the ring gear to drive pinion gear backlash making sure that it is the same (within +/- .002) as when originally checked in step 5. If backlash is not the same, re-shimming will be necessary.

Note: When re-shimming to attain proper ring and pinion backlash, refer to vehicle service manual for applicable procedures.

Step 13

Temporarily remove the differential pinion shaft. Carefully re-install both left and right axle shafts pushing them inward to expose their C-clip grooves at the center of the differential. Install both C-clips one at a time pulling outward on each axle shaft causing the C-clip to fully “seat” into the counter-bore of the differential side gears. Once both C-clips are fully seated, re-install the differential pinion shaft and pinion shaft lock-screw to proper torque specification.

Step 14

Install the axle assembly differential cover with new gasket / sealer and tighten cover bolts to proper torque specification.

Step 15

Remove lubricant fill plug and install recommended volume and type of rear axle gear lubricant and limited slip differential additive. Re-install and securely tighten fill plug.

Step 16

Inspect and re-assemble all brake components. **Refer to vehicle service manual for applicable procedures regarding re-assembly and/or replacement of brake components.**

Step 17

Re-install rear wheels taking care to alternately tighten lug nuts to proper torque specification.

Step 18

Take account of all tools and components and then lower rear wheels to the ground.

Step 19

Test drive vehicle to insure proper installation.