

# EATON

## Detroit Locker Automatic Locking Differential Rear axle installation instructions

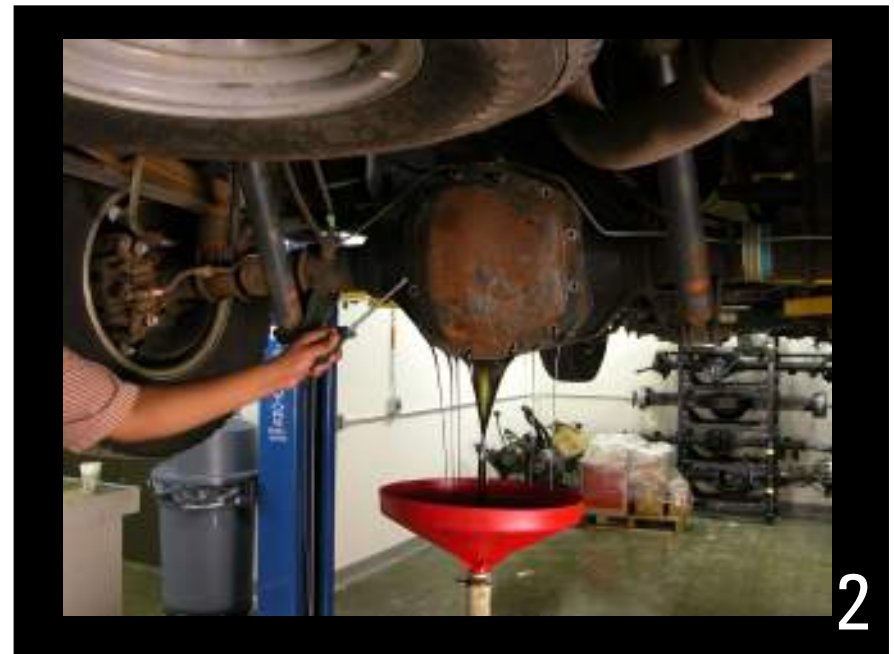


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Prior to installation, be sure to have all of the proper installation components necessary for the job.



Before removing the cover plate, leave the top two bolts in place. This will prevent access oil to splash. Use a rubber hammer to loosen covering from housing.



Measure the backlash from three equal places around the ring gear. Record measurements (if reusing ring and pinon set).



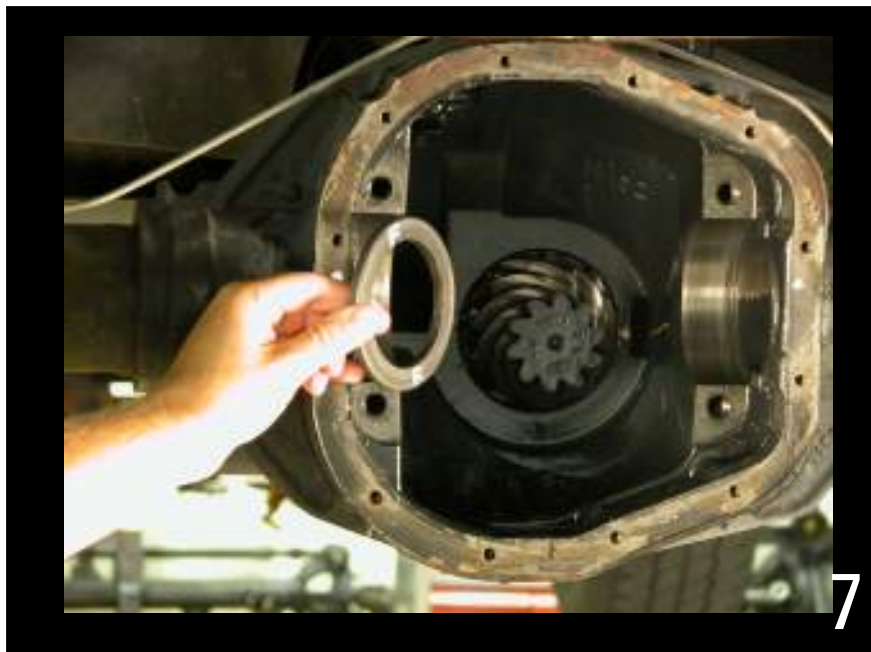
When removing axle shafts, do not allow the full weight of the axle to drag or rest on the axle seals. Inspect axle seals for wear.



Remove bearing caps on differential - Mark the caps so that you know which side they belong on - and which side is up. Also make note of the shims installed between the bearing and the carrier for reinstallation.



Remove the old differential from housing. Be advised that additional help may be required, some domestic differentials can exceed 40lbs.



Mark shims "F" for flange side and "P" for plain side.



Remove ring gear bolts  
\*Bolts may have left handed threads.



9

On units equipped with ABS, mark the tone gear so when you reinstall it the proper side is up.



10

Remove ring gear with punch and mallet, tapping evenly around diameter to slowly remove it from differential housing.



11

Wash the differential case, ring gear, ring gear bolts and other parts with nonflammable solvent.



12

Install new bearing cones on flange side and plain side of Detroit Locker case use press. Make sure bearings are seated properly.



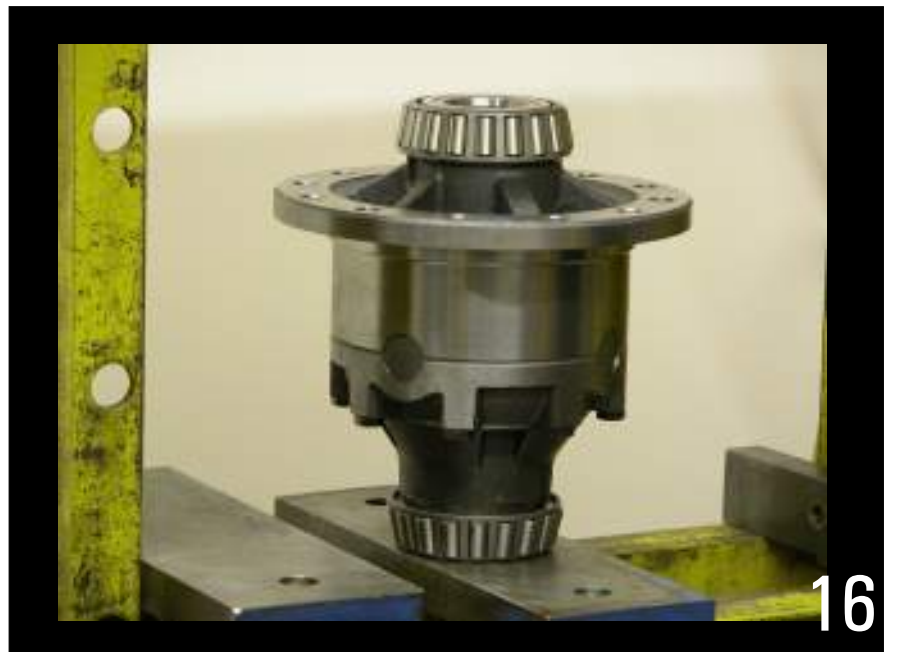
Measure the original differential case from precision (base) plate to ring gear flange. Please note that set up bearings (or equivalent) must be used to obtain an accurate measurement.



And from precision plate to top bearing shoulder.



Measure the new Eaton differential case from precision (base) plate to the top of the bearing shoulder.



Here you can see both bearings installed correctly.



17

\*Helpful hint\* The rings gear should have a press fit on to the differential. To help with ring gear mounting, you may place the ring gear and tone (ABS) ring in a conventional oven. Heat to 250 degrees (should take about 15 minutes). Let cool before installing all of the ring gear bolts.



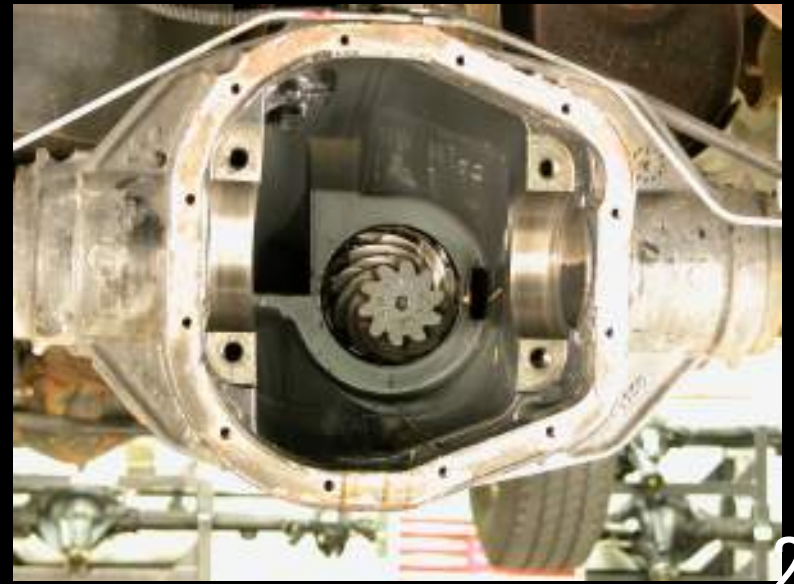
18

Install ring gear and tone gear - making sure the mark on the tone gear lines up with mark made earlier.



19

After letting ring gear cool for about 30 minutes, use Loctite to install ring gear bolts - then use torque wrench to secure ring gear to differential.



20

Before installing differential assembly back into housing, make sure both are clean and free of contaminates.



21

Measure existing shims. These will be the shims you use for the initial install. The shim pack you ultimately use will vary with each axle housing and carrier assembly.



22

Use grease to hold shims in place.



23

The grease holds the shim in position. Now you're ready to install differential assembly.



24

Install differential assembly. It is a snug fit so some force is required. Here we're using a brass hammer. It's a good idea to have two people lift the assembly into position.



25

Reinstall bearing caps.



26

Note the marks you made on the housing and bearing caps to ensure caps are installed on the correct side.



27

Put bolts in with impact wrench to make sure differential is seated properly in journals.



28

Check backlash. If it is different from that previously measured (picture 3) differential shims will need to be changed in order to re-establish the original backlash measurement. The differential must fit snug into the housing. A total of .006" (.003" per side) of bearing preload is required for proper bearing seating.





29

Depending on the brand, new ring and pinion sets have a backlash specification starting anywhere from .005" to .012" and should not exceed more than .003" variance (around the ring gear.)



30

For new ring and pinion installation, lightly coat both the front and back of four to six ring gear teeth with gear marking compound.



31

To establish the correct contact pattern, for new ring and pinion sets, rotate the pinion shaft by the drive shaft flange in both forward and reverse.



32

Check contact pattern. Most ring & pinion sets will include a chart that indicates acceptable patterns. Check chart at the end of this section of the document.



33

Remove bearing cap bolts and put Loctite on bolts.



34

Torque bolts to specifications.



35

Depending on which type of Eaton differential that is installed, a lock test may need to be performed at this time. This will ensure proper engagement before driving.



36

Use a gasket or gasket material to seal the cover plate to the housing.



37

Install differential cover.



38

Reinstall axle shafts.



39







Use Loctite to hold hub bolts in place.



40

Remove filler plug, install lubricant, put fill plug back in place. Road test vehicle.

# Tooth contact pattern chart

	<p><b>IDEAL CONTACT</b> Pattern is spread evenly over tooth's profile with concentration nearer toe than heel.</p>	
	<p><b>COMPETITION CONTACT</b> Pattern concentrated just up from the toe covering 1/3 to 1/2 of the tooth.</p>	
	<p><b>HIGH CONTACT</b> Pattern is concentrated at the crown of the drive gear tooth.</p>	<p>Move the pinion deeper in towards the differential carrier (add pinion shim).</p>
	<p><b>LOW CONTACT</b> Pattern is concentrated in the root of the drive gear tooth.</p>	<p>Move the pinion out away from the differential carrier (subtract pinion shim).</p>
	<p><b>HEEL CONTACT</b> Pattern is concentrated off the heel end of the drive gear tooth.</p>	<p>Move the ring gear closer to the pinion (decrease backlash) while maintaining minimum backlash.</p>
	<p><b>TOE CONTACT</b> Pattern is concentrated off the toe end of the drive gear tooth.</p>	<p>Move the ring gear away from the pinion (increase backlash) while maintaining minimum backlash.</p>

## TEST FOR PROPER INSTALLATION AND OPERATION

### INSTALLATION TEST

#### Step 1

With the engine turned off, raise NoSPIN equipped driving axle(s) until all wheels are out of contact with any surface. Place the transmission in gear or park so that the driveshaft is locked and does not rotate.

**NOTE:** Test for *forward disengagement*.

#### Step 2

With two people, rotate both wheels rearward, as far as possible to lock both wheels.

#### Step 3

With the left wheel securely held in the rearward direction, rotate the right wheel slowly forward. A faint indexing or clicking sound should be heard as the NoSPIN disengages on the right side.

#### Step 4

With the right wheel slowly rotating forward, the left wheel should be rotated slightly forward. This will lock both wheels.

#### Step 5

Again, rotate both wheels rearward, as far as possible to lock both wheels.

#### Step 6

With the right wheel securely held in the rearward direction, rotate the left wheel slowly forward. A faint indexing or clicking sound should be heard as the NoSPIN is disengaged on the left side.

#### Step 7

With the left wheel slowly rotating forward, the right wheel should be rotated slightly forward. This will lock both wheels.

Repeat steps 2-7 except, test for *reverse disengagement*. If the above steps are completed successfully and rotating wheels disengage easily by hand, rotate freely and evenly, lock both wheels when required, and produce a faint indexing or clicking sound, then the NoSPIN is properly installed and is functioning correctly.

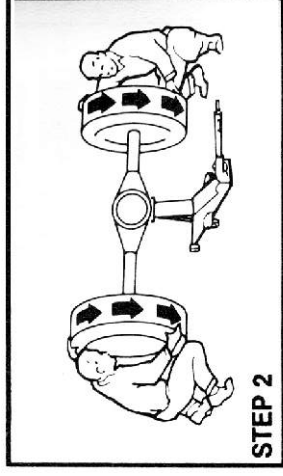
**IF EITHER WHEEL DOES NOT ROTATE FREELY IN EITHER DIRECTION** or does not lock both wheels as required, recheck the installation of the NoSPIN in the axle. Also check hand and foot brakes for possible drag caused by improper adjustment. Be sure that all thrust washers have been removed from the standard differential support case.

To check normal NoSPIN operation, drive the vehicle on a flat surface with good traction, in a right or left circle in forward and reverse to be sure that the outside wheel is free to overrun (i.e. that the outside tire does not scuff). A clicking or indexing sound may be heard. The sound of gear re-engagement may also be heard upon completion of the turn. This is normal.

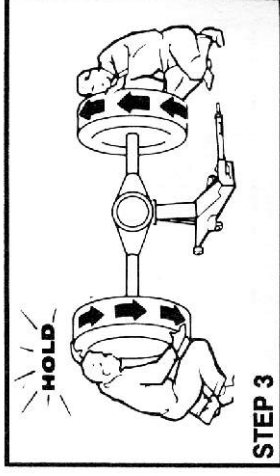
### OPERATION TEST

Check to see that both wheels of each NoSPIN differential equipped axle are driving. Make this test under load, so that engine torque is applied through the NoSPIN differential with the wheels on the ground. One way to achieve this load is to drive up against a solid obstruction (on loose dirt or gravel, if possible) and attempt to spin both wheels together. Perform this test in forward and reverse. (Exercise caution when performing this test to avoid damage to vehicle or obstruction.)

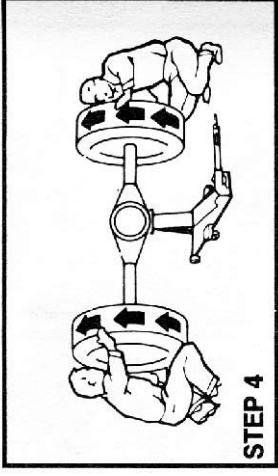
**CAUTION: DO NOT OPERATE THE VEHICLE IF BOTH WHEELS OF A NoSPIN/DETROIT LOCKER EQUIPPED AXLE ARE NOT DRIVING. POWER TO ONLY ONE WHEEL CAN CAUSE SERIOUS STEERING PROBLEMS AND LOSS OF VEHICLE CONTROL AND RESULT IN A MISHAP WHICH CAN CAUSE PROPERTY DAMAGE, INJURY, EVEN DEATH.**



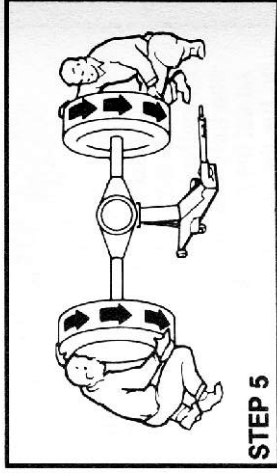
STEP 2



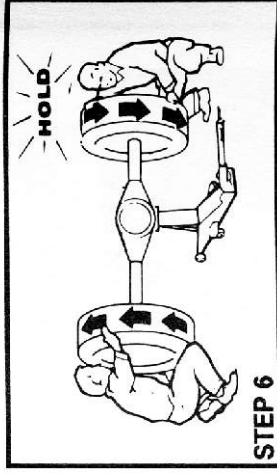
STEP 3



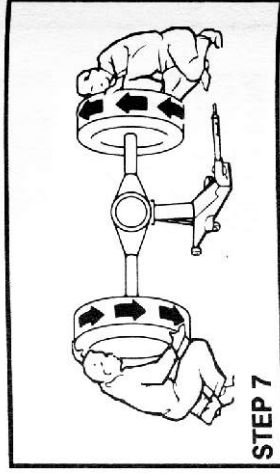
STEP 4



STEP 5



STEP 6



STEP 7