

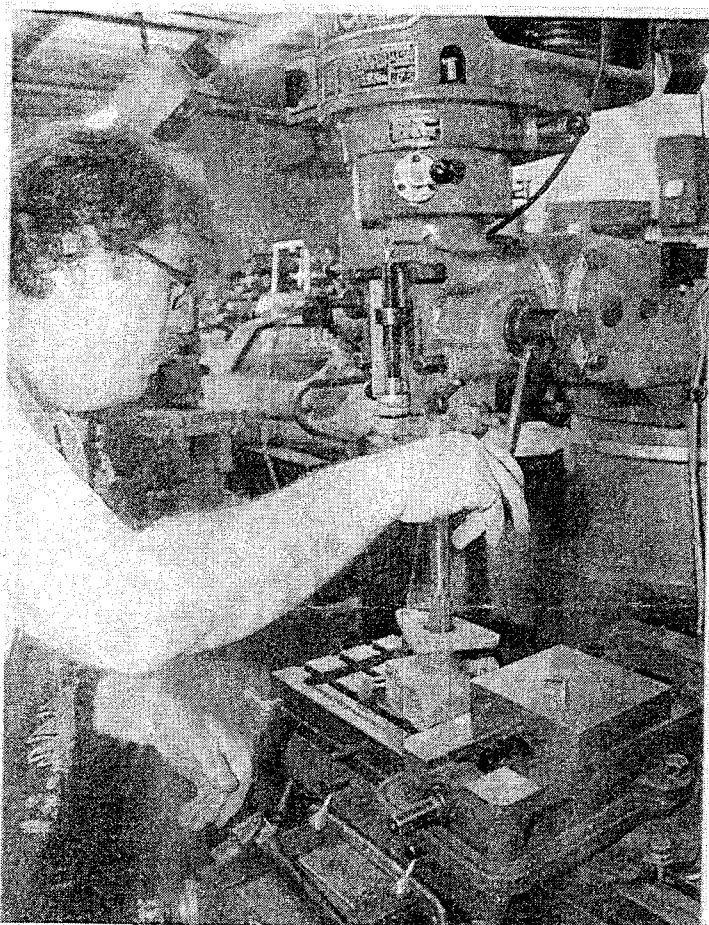
Steering Box
Rebuild Inst.

92742
6 pgs



Right Out of the Box

Classic Performance Products Has the Cure for Your Effie's Steering Box

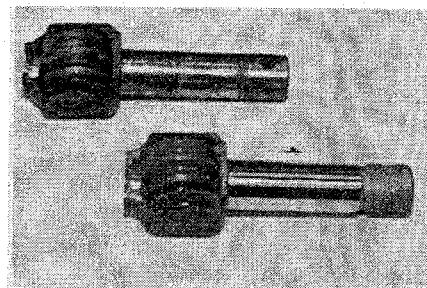


By **MATT EMERY**
Photography by **THE AUTHOR**

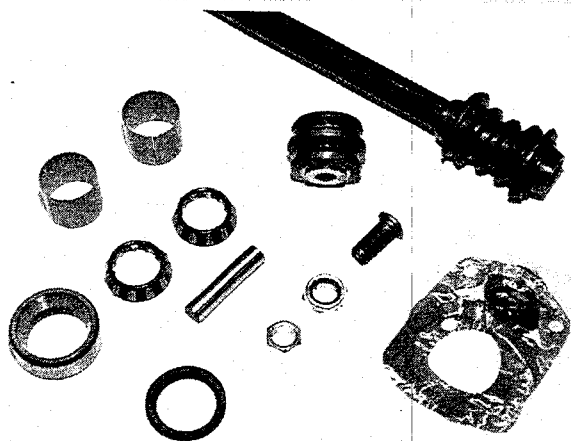
When it comes down to it, there are two main components to your truck that have to be in good working order if you and your passengers are going to be safe. One is the braking system, and the other is steering. If you can't stop when you want to or you can't go in the direction you wish your truck to go, trouble is just down the road.

Just as a properly operating braking system is the sum of its parts, the steering system also needs to work in unison if it is to give the full measure of safety and performance. And it all begins with the steering box. It should come as no surprise that after 40 years of wear, tear, and certain backyard mechanics, the average steering box is in dire need of refurbishment. Luckily, Classic Performance Products has all the new parts you will need to return the action and stability to your Ford steering box. Also included is a complete instruction sheet, and advice is but a phone call to the company away. **CT**

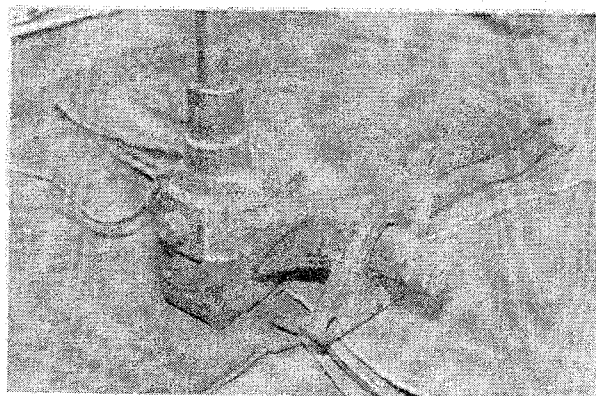
In extreme cases, the sector shaft is so bad that it is necessary to have the shaft hard-chromed and machined. If yours is in as bad shape as the above one, do not throw it away, the cores are valuable and there are not many around anymore.



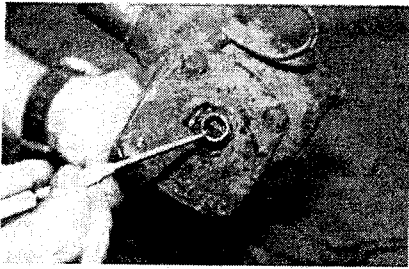
Just ship it to CP, and the technicians there can do it for you.



The Classic Performance (CP) kit comes with all that you will need to return the turn to your Effie steering box.



Here is a typical box that comes into CP. Notice the steering shaft has been cut off. It is probably better to buy a new shaft than to try to save the old one. It is almost impossible to get the parts apart if the steering box is not in the center (straight) position. Use a pair of vise grips to spin it into position.



The adjustment screw on this box is in all the way. This is usually an indication that the gears inside are not only shot, but that the previous owner may have unintentionally done it. The adjustment screw on these boxes does not work how you think it might. It does not make the action of the steering box tighter, it simply lines up the two gears inside the box so they mesh together properly. So screwing the thing to the max just may cause the gears to bind up and destroy themselves. The adjusting screw is just that: It adjusts the box.



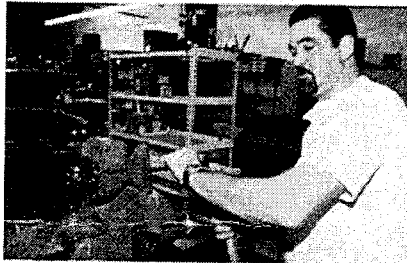
Another bad sign. The lockdown nut on the box turned out to be a lug nut. The jam nut shown on top is the one that the box should have, and it is supplied with the kit.



Some of the early boxes came with this star washer to hold the adjustment screw in place. Toss it. The problem is that the keyway in the screw allowed the fluid in the box to leak out. The CP kit includes a new non keyway screw to alleviate this problem.



While the kit includes a new screw, it does not include the washer it screws onto. So when disassembling the box, be sure to keep it safe. With the cover off, it becomes apparent that this box has been filled with grease. It should have 90-weight gear oil in it. The problem is that the grease will cling to the walls of the box, and the gears will eventually be running dry. This will cause the gears to mar each other, especially in the center, or straight, position.



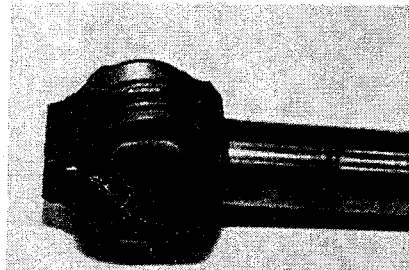
With the box secured in a vise, a hammer and brass punch are used to tap the sector shaft out. It does not take much effort to do this, so don't take a big swing with the hammer or you will flare open the end of the shaft.



With the bottom plate off, it is possible to get the worm gear assembly out. The reason for the long straw on the bottom plate is that the wire for the horn button can travel through it without letting any fluid escape from the box.



A few taps and the grease-covered worm gear assembly is out.



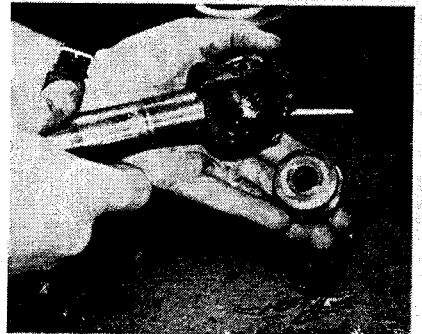
These shots show the damage caused to the gears where they mesh in the center position. As stated, if the adjustment is too tight, binding will cause the gears to rub pits and grooves into the faces of each other.



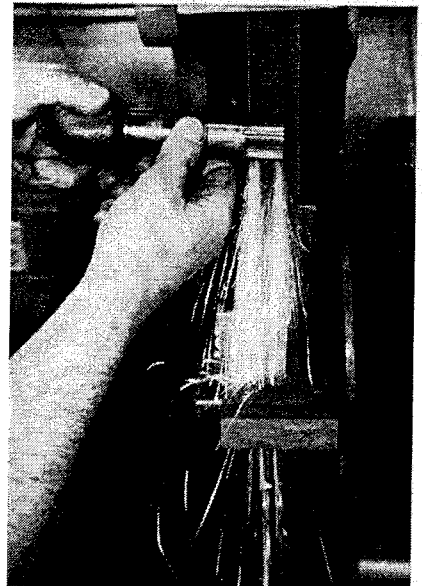
To prep the sector shaft for the new roller gear, a carbide rasp bit is used to remove the flattened end of the steel pin that holds the roller in place.



The pin is driven out of the sector shaft with a hammer and punch.



With the pin out, the roller is removed from the sector shaft. Notice the roller gear rides on needle bearings. Also, the washers will be used again.



The spline end of the shaft is lightly sanded to make sure it is slightly under-sized. This will ensure that it fits the new bushings well. Now is the time to prep the shaft, not after you have installed the new roller, because you do not want any debris in the new needle bearings. It is at this stage that the steering box and sector shaft are placed in the sandblasting cabinet and cleaned of all debris.



After a little blast of WD40, a piece of emery cloth is used to polish the shaft. This step is for shafts that are not badly damaged and just need a little care. If the shaft has deep pits or gouges, you need to have the shaft rechromed.



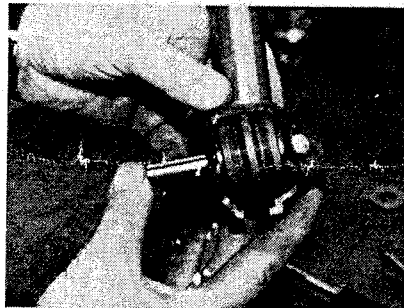
The new roller gear comes with the needle bearings already installed. They are held in place with a little cardboard tube. Do not remove the tube because the needles will fall out, and you will have little to no chance of putting them back in.



The time has come to install the new roller into the sector shaft. Set the roller in place and install the two washers and try to roll it. When installed properly, the roller will be able to roll smoothly, not too tight and not too loose. The roller is not supposed to spin freely or have any side-to-side play.



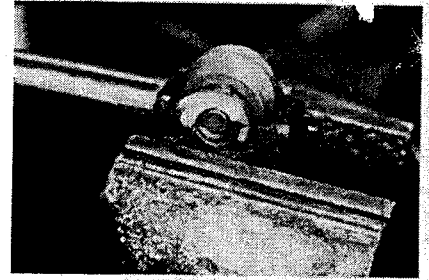
Chances are that the roller will be a little tight, and you will have to take a little off the inside of the sector shaft. Jim uses a small grinder that has been fitted with a soft wheel. Jim takes his time and removes only a little material, virtually polishing the area, and tries the roller and washers again.



With the roller in place, the new pin is installed. By slipping in the pin, it will push out the cardboard tube, and the needle bearings will stay in place.



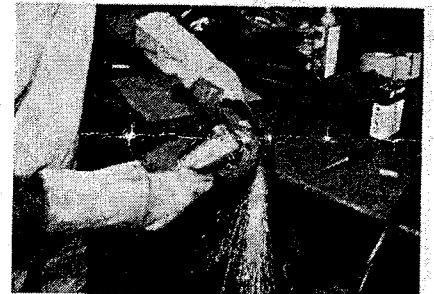
The pin is longer than necessary, and it will need to be ground down to fit. Holding the pin flush on one end, the other end is shortened using a sander.



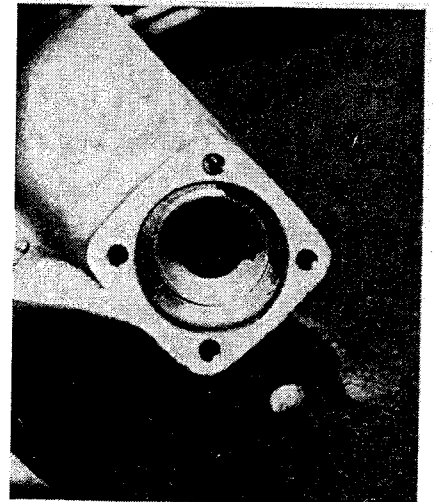
Here is how much of the pin should be left prior to the welding stage.



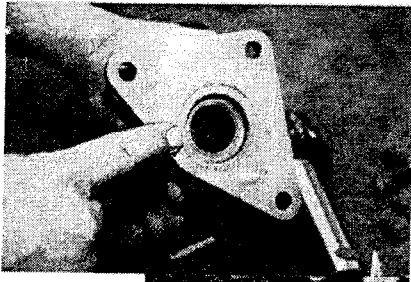
A small bead is used to hold the pin in place. Notice the sector shaft is protected with a cardboard tube during the welding process. This will keep any errant balls of weld from sticking to the shaft.



As the sector shaft needs to rotate, the welds need to be ground smooth so nothing is sticking out to catch on the inside of the housing.



While the kit comes with a new race for the bearings, if the old one is not scarred or damaged, leave it alone. Simply take a piece of emery cloth and polish it up, and it will be fine. The reason for doing this is that it is difficult to get the old one out.

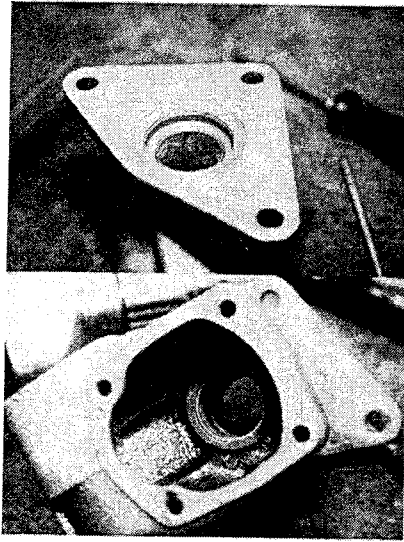


With the box clean, it is time to remove the old bushings. As this photo shows, the bushings are very thin. To get the old ones out, a screwdriver is gently tapped between the bushing and the wall of the box. And we mean gently.

The trick is to pry away the edge just enough so a punch can be used to drive out the bushings. Be careful not to gouge the box in the process.



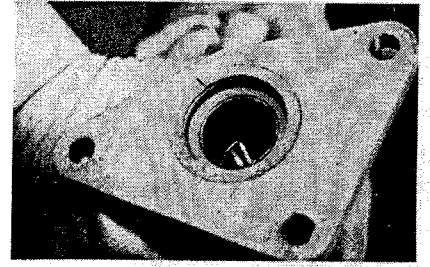
With the old bushings out, drive the new ones in. There are actually two bushings, and they are driven in from the opposite ends of the box. Care is taken to drive the bushings in straight and square.



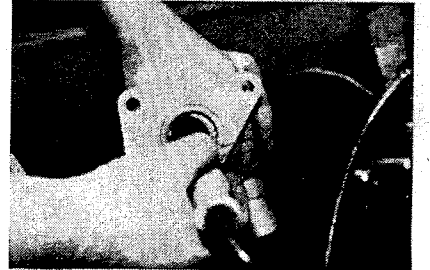
The bushings are driven in to the very edge, and there will be a small gap in the middle of them when done.



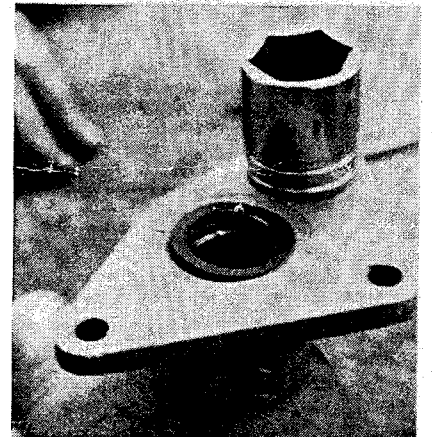
Once installed, the bushings have to be sized to the sector shaft. While CP uses a mill with an adjustable bit, this job can also be accomplished with a small hone, such as a brake cylinder hone. When using a hone, the main thing to remember is to keep the hone moving in and out during the cut; never let the hone sit in one spot because this will cause a groove to form. Also, use of WD40 as a cutting fluid is recommended. Sizing the bushings to the shaft is just like fitting the roller into the sector end, it needs to be done slowly while taking away a small amount of material at a time. The sector should fit snugly with no slop, but be aware that when the box is washed to remove all debris caused by the milling process, the sector shaft will be looser. So if the fit is close, wash out the box and fit the shaft. You may have to do this a few times to ensure too much material is not taken out, but there is no going back. If you take too much material and the sector is too loose or has up and down endplay, you have to get new bushings and try again.



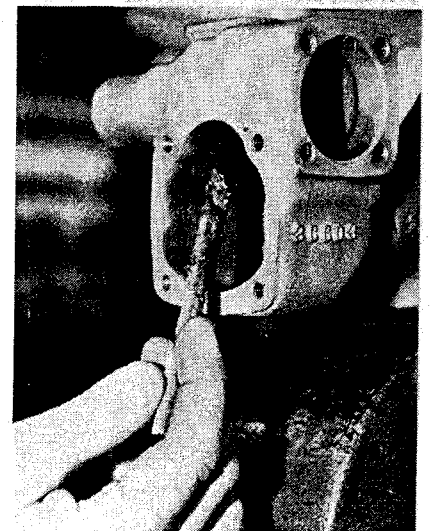
It may be difficult to see, but just the high spots needed to be taken down on these bushings, yet due to the care displayed, it took four passes to get the sector to fit like we wanted.



After the last pass, the box was cleaned thoroughly to ensure no cuttings were left behind to foul the bushings or bearings.



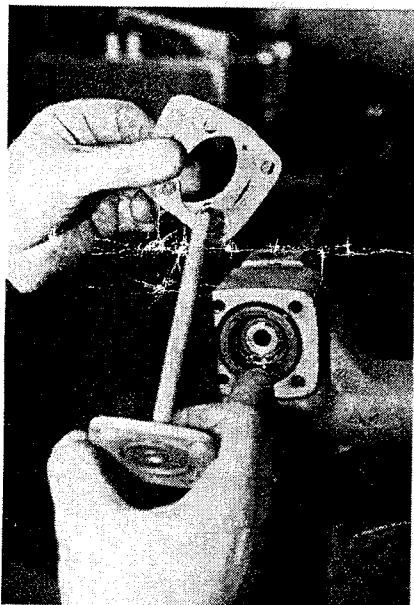
A socket is used to set the new rubber seal in place.



A dab of grease is placed on the race prior to installing the new steering shaft, bearing, and worm gear assembly.



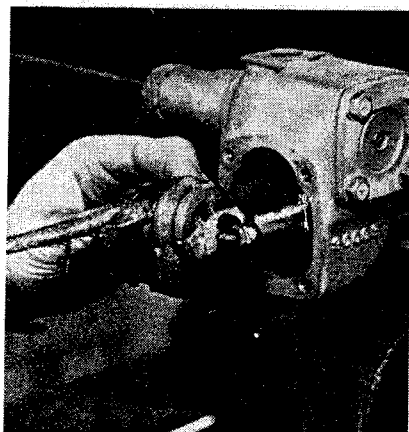
The lower bearing and race are greased and installed. CP also recommends that a few drops of 3 in 1 oil be used on the bearings.



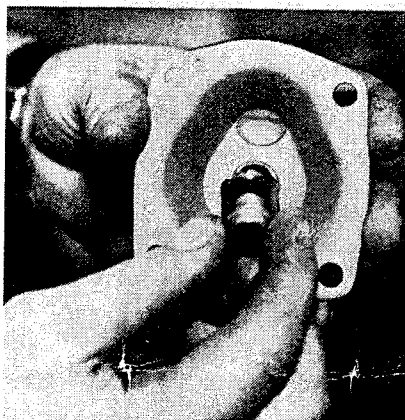
It is necessary to properly shim the worm gear assembly. CP recommends that while the kit comes with six shims, four should be tried first. The end plate is secured in place before any testing can be done.



Test it to feel the movement of the shaft and also to see if there is any end movement. The shaft should spin smoothly and have no endplay.



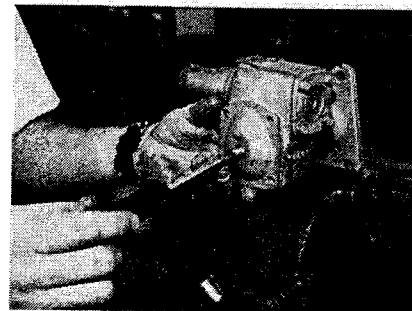
After the bushings have received a coating of grease, some more grease is placed on the sector roller.



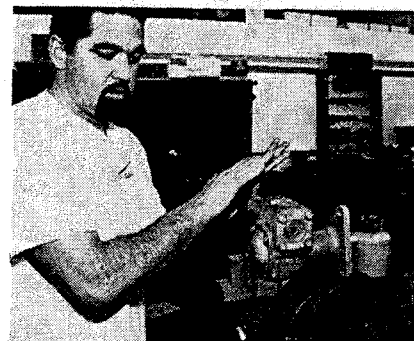
The new adjustment screw and washer are screwed into the cap.



The washer slips into the notch in the end of the sector shaft, and the assembly is slid into place.



Jim screws the adjustment screw so that it pulls the sector shaft back slightly, this way the gears will not be crammed together when he tightens the bolts down on the end plate.



It is necessary to find the center point of the box before adjustment can be done. Turn the shaft all the way to one side and place a mark, then turn it all the way to the other side and place a mark. Count the turns from stop to stop (it should be 4-1/2), then turn back 2-1/4 turns to the center. This is where the gears are at their highest and where the box should be adjusted. Spin the steering shaft and watch the end of the sector shaft. When the box is adjusted correctly, the two shafts should turn smoothly with no binding or hesitation. That means that when the steering shaft starts to turn, the sector shaft should begin to turn at the same instant. One thing to remember when adjusting the box is that it takes very little to make a big difference, so only turn the screw a quarter turn at a time, and then check the shaft play.



The last step is to fill the box with 90-weight gear oil, not grease, after the box has been installed in the truck.

SOURCE

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