

Taming The Wild

Steering box rebuild

Text and photos © Jerry Rotert 2005

Ok so you've replaced the a-arm bushings, ball joints, tie rod ends, control rod bushings, shocks, re-aligned the front end, adjusted the steering box and for some reason the thing is still all over the road. It weaves back and forth between the ditches and has about a foot of play in the steering wheel. When you hit the brakes it's like playing the slots, you never know what's coming up.

So what's the deal?

Most likely you have a worn steering box, not to fret ... it's not that hard to rebuild that box and bring the wild thang under control. Normally new bronze bushings, seals and gaskets are all that's needed to bring it back up to shape.

A word about gear box lube. The original GM gear box lube is no longer made. Check with your Corvair vendor or local parts store for the latest recommendations on the proper type of lube to use.

The first step is to remove the box. I'm not going to go into detail on that here because there are several versions of the corvair gearbox so refer to the shop manual for your model. You do have a shop manual don't you?

A shop manual is critical for working on any car old or new and you will need it to do the adjustments after the box is rebuilt.

Now that you have the gearbox removed lets follow the pictorial and see if we can't get it done..



1. Remove the gearbox according to your shop manual. Don't have one? Get it! It's a must have.



2. The adjusting screw is turned all the way in. That's not a good sign. Someone likely tried to mask worn steering components by adjusting here.



3. Use a puller and remove the pitman arm. I almost always have to apply some heat from a small propane torch to get them off.



4. Scrape off the excess grease then use sand paper or emery paper to clean the shafts. This will aid in disassembly.



5. Remove the jam nut and the 3 screws that hold the cover. Now turn the adjusting screw all the way in and it will push the cover right off.



6. Remove the pitman shaft being careful not to lose the special shim on the adjusting screw.



7. Next we will have to break loose the spanner nut. I don't have a tool for this so I'll just use a large punch.



8. Remove the nut which will expose the worm shaft and bearing. Don't lose or damage the bearings because they are usually reusable.



9. The worm gear and nut should pull out easily. That's why we cleaned and sanded the shafts. Now is a good time to clean out the old grease.



10. Use a socket to drive out the bushing and seal. Note the socket is turned around backwards. This keeps the socket from being damaged.



11. You will have to use a puller to remove the bushing from the cover. A pilot bearing puller works well here. Replace all the bushings .



12. Clean out some of the grease then check the bearing races for pitting, scratches or discoloration. Replace if any problems are found.



13. Check the bearings also. Check each ball carefully and replace if necessary. The balls can be replaced (as a set) but you'll still need the shells.



14. Do Not disassemble this unless absolutely necessary. If it turns smoothly end to end leave it alone. Also don't let spin to the end on its own.



15. This is what you don't want to find. The gears are galled and must be replaced. This is usually caused by over tightening the adjusting screw.



16. By contrast here is a near perfect gear set supplied by California Corvair Parts Inc. Its getting very hard to find them in this good of condition.



17. Start disassembly by removing the ball guides. Pry them straight up evenly with a screwdriver to prevent bending the tabs.



18. Shake, twist and turn all 48 balls out of the worm nut into a suitable container. Clean and inspect all components.



19. Notice the tabs on the end of the ball guides. If the worm nut is allowed to run all the way to the end (when assembled) it could bend these tabs.



20. Insert the new worm nut on shaft. Now count out 36 balls in groups of 4 and insert one in each hole. Repeat until all 36 balls are inserted.



21. Smear some grease in all 4 of the guides then place 6 balls in each of 2 of the guides. Now place the guide halves together.



22. Install both ball guides. If they don't seem to want to go in make sure they are centered in the holes and tap *gently* with a hammer.



23. Install and secure ball guide clamp. Lubricate well with a good gearbox lube. Make sure you get it in the threads and work it into the nut assembly.



24. Drive in the new bushings and seals using the sockets you drove them out with. Lubricate the bushings and seals with gearbox lube.



25. The manual says adjusting screw clearance should be no more than .002. This one will have to use a thicker shim (corvair.com part #CX3810).



26. Pack everything with lube (not shown here for clarity), you can't get too much. Then slide bearing on shaft and insert it all into the housing.



27. Install other bearing and screw cap on. In the following steps you will need to turn the shaft with a torque wrench. Gently push a socket onto the splines to torque the shaft.



28. Install pitman shaft being careful to center gears. Install adjusting nut and shim then install bearing cap by turning screw counter clockwise and backing it into the cap just as it was removed.



29. Center worm shaft by counting turns from end to end then turn back exactly half that number. Turn lash adjusting screw in until it just gets snug, then back off 2 or 3 turns for now.



30. While turning worm shaft with a slow steady pressure slowly tighten the large worm bearing adjusting nut until you get 3 1/2 to 4 1/4 inch pounds torque. Now lock down the large jam nut.



31. Now tighten pitman adjusting screw while torquing thru center for an additional 8-10 in. lbs. For example if you had 4 in. lbs. in step 30 you would need to adjust the screw until you have $8 + 4 = 12$ min. or $10 + 4 = 14$ max. Always make final adjustment in the clockwise direction. Tighten the small jam nut.



32. Now all that's left is to install the box. Be sure the box is centered (remember counting the turns?), the wheels are straight ahead and the steering wheel is centered before installing the pitman arm.