steering box. This car lost 90% of the 90 wt. gear lube in six months. The loss was around the pitman arm shaft. Upon initial inspection the shaft fit seemed good. However, the exterior cork seal was worn, and a new one was fabricated and installed. The gear box and sha was installed in the car and then six months later, the leak.

Now! How to get the box assembly out of the car at this late date? No problem! Let me explain. Jack the front end, remove the left front wheel and the side par under the fender. Remove distributor cap and hot lead to generator (Insulate with tape, it is hot!). Now comes what I think is the secret to this operation. Remove left headlight, bucket and all. Now you have a beautiful hole to exit through. Remove all other clamps and fire wall seal and loosen under dash. Remove Pitman arm (a small gear puller is needed as it's splined on), and then remove the two "U" to the frame, note shim location. Now it's loose and a helping hand is needed. In my case youngest daughter Janet was available. With Janet standing by, I remove the ...h clamp and replace it with Janet. Now, with one arm ...ough the bucket hole and the other in the hood, I gently lift and move toward Janet. Now, some twisting action is required while moving the assembly forward aiming at the bucket hole and with more twisting action. Now the gear box is clear and Janet turns loose at the firewall and the assembly is out but not fixed. Up to now I haven't been much help but there is more. A complete disassembly of this unit is required as my plan was to have pitman arm shaft metalized and then resized, but on reinspection the fit was reconfirmed as good.

Now what? A research program was started with a shaft seal in mind. Finally, Chicago Rawhide Co. seal # 12334 fit perfectly and the expense was $1.75. Not bad so far! Now to find a machine shop with a jig bore that would take small jobs. One was located. A seal cavity was machined to a light press fit with the OD of the seal on the outboard end of the gear box shaft bushing. An insignificant (approx. .12") amount of the bushing was removed with this operation. Now a reassembly and reinstallation and all is well after two weeks.

One word of caution. Br sure the gear box locating pin is inserted and replace shimssuch that no bending of the shaft occurs when the gear box "U" bolts are tightened. The cavity machining cost was $14.00 here in California.

To those who may be interested and are not able to obtain this seal (Chicago Rawhide Co. seal # 12334), I'll be glad to send one. Drop me a line. The cost is $1.75 plus 11 cents tax plus postage or United Parcel. One can write directly to Bearing Specialty Co., 202 W. Pondera St., Lancaster, CA 93534. Ask for C.R. #12334 Oil Seal (Chicago Rawhide - Elgin, Illinois)

Hope this noteworthy technical addition is a help to those ...ing steering gear lube-loss problems.

My # 910th New Year's resolution is to keep the Airflow Newsletter up to date on the program and some photos of the finished product.

Do with this as you see fit. My best to you both. You are still doing a great job on the Newsletter. Sincerely,

John Keen Miller

JOHN-

TECHNICAL Tips

'cause we all have questions!

Removal and Repair of the Steering Gear on a 1934 DeSoto Airflow

Article and photos by Gary Frey

In evaluating the 1934 DeSoto Airflow before I purchased it, I noticed the steering was quite sloppy. As I drove down the road, the car would move from side to side (almost a complete lane width) without moving the steering wheel. I knew that there were bias tires on the car, but there should not be that much movement. The steering wheel had about 120° of free play before from side to side. The person who had the vehicle indicated that he purchased it a few months before, but did not drive it. I purchased the vehicle, took it home and parked it in the garage for about 4 months before I had time to work on it. *(I have seven other classic Chrysler vehicles that needed their yearly maintenance performed before this years cruises started).*

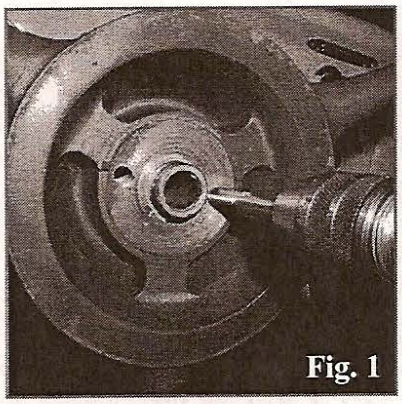
Fig. 1

I put the car up on four 6-ton jack stands to examine the steering linkage. I removed the left front tire to get a better look at the pitman arm and steering gear. I twisted the brake drum from side to side to simulate the sideward movement of the car going down the road. As the drum moved, I noticed the pitman arm pushed the steering gear shaft up and down. There was too much clearance between the steering gear shaft and bushings, which allowed the car to move from side to side when going down the road. It was obvious that the bushings or steering gear shaft or both were worn and must be fixed.

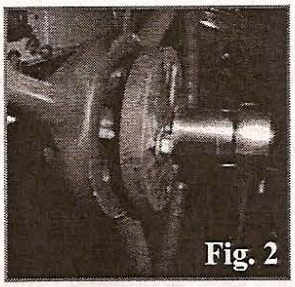
Fig. 2

To get the steering gear out of the vehicle, I did not want to tie up my 4-post hoist for several weeks while the steering gear system was being fixed, so I kept the car on the jack stands. After looking at the engine compartment, the best way to take the steering gear assembly out of the vehicle was **UP** over the radiator and out the engine compartment.

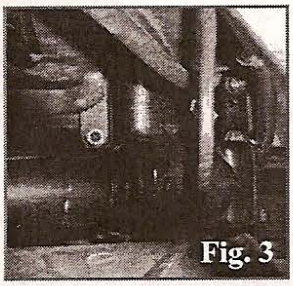
Fig. 3

1. To begin, I removed the steering wheel, unscrewed the horn ring and found there was nothing to attach a puller to. I used an impact gun and a 1-1/4" socket to remove the steering wheel attaching nut. An impact gun is best to remove the nut, since the wheels are off the ground and a normal socket wrench would keep turning the steering wheel until it was at a full stop. A socket wrench will put unnecessary stress on the steering gears, especially if the nut is on very tight.

2. I drilled two holes and tapped them for 5/16-18 bolts in the steel ring in the center of the steering wheel (Fig. 1). I was careful not to drill holes to deep, as the holes will come out into the side of the steering wheel. I placed a puller over the steering wheel, and snugged up the outside 5/16-18 mounting bolts while also turning in the center screw down on the steering shaft (Fig. 2). While holding the steering wheel, I turned the center screw and the steering wheel pulled off the shaft. (When you do this procedure be careful to save the keyway that holds the steering wheel to the steering shaft.)

3. Since the steering gear is mounted to the frame below and under the generator (Fig. 3), all of the mounting nuts and "U" clamps cannot be removed from the top of the engine compartment. Also the engine side shield (Fig. 4) covers the steering gear output shaft, preventing its removal. I removed the screws holding the engine side shield in place (Fig. 5) and removed the shield to expose the steering gear (Fig. 6).

4. Using an impact gun and a 1-7/16" socket, I removed the nut and lock washer holding the pitman arm onto the steering gear shaft. Placing a pitman arm puller over the pitman arm (Fig. 7), I turned the screw and pulled the pitman arm off the steering gear shaft. After removing the nut, lock washer, and pitman arm, the shaft seal retaining spring, shaft seal cover and shaft seal can be removed from the steering gear shaft (Fig. 8).

5. Looking down from the engine compartment (Fig. 9), all of the "U" bolt mounting nuts can be seen. Using a 24" extension and 9/16" socket, I removed all four nuts and lock washers. Once all nuts and lock washers were removed, both the front (Fig. 10) and rear "U" bolts were removed. After removing the "U" bolts, I lifted up the steering gear and removed the spacers under the rear of the steering gear at the rear "U" bolt (Fig. 11).

6. With the steering gear loose from the frame, I went to the passenger compartment and remove the bracket that holds

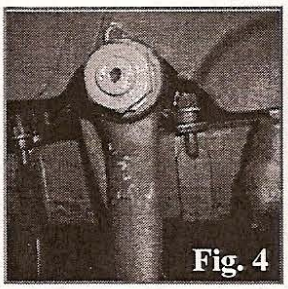
Fig. 4

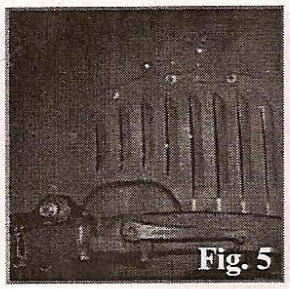
Fig. 5

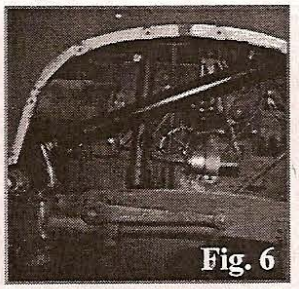
Fig. 6

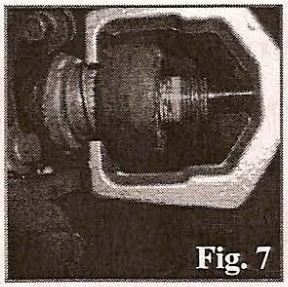
Fig. 7

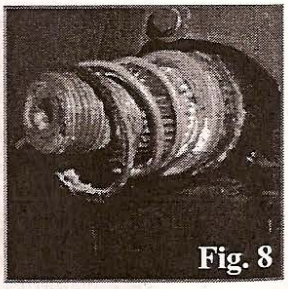
Fig. 8

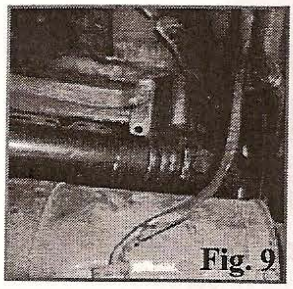
Fig. 9

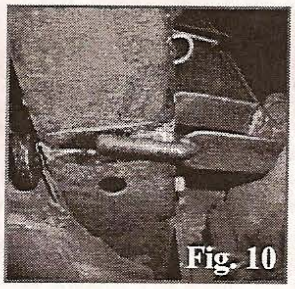
Fig. 10

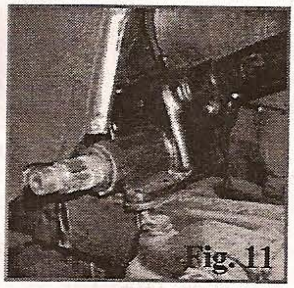
Fig. 11

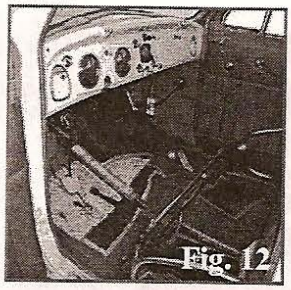
Fig. 12

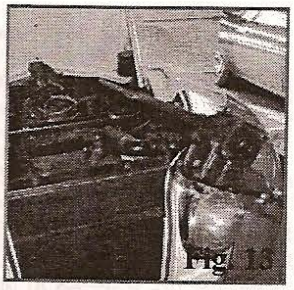
Fig. 13

the steering column to the dash and lower the steering column (Fig. 12). Standing in front of the car, I reached down through the engine compartment and grabbed the steering gear housing. Pushing it backward and pushing the steering column into the driver compartment, far enough to clear the generator, I rotated the steering gear "clockwise" pointing the steering gear shaft downward and lift the steering gear up out of the engine compartment. Pulling the steering gear forward, I rested it on the bar on top of the radiator (Fig. 13).

7. Pulling the steering column through the hole in the dash, out of the engine compartment, I placed it on a workbench. I then removed the steering column jacket retaining nut and screw (Fig. 14) and pulled the jacket off the shaft (Fig. 15). Removing the three bolts and one screw from the end plate of the steering gear (Fig. 16), I then pulled the plate off, pulling the horn wiper and horn wire out of the steering gear shaft (Fig. 17). I removed the four bolts that hold the side plate/backlash adjusting screw and removed the plate (Fig. 18).

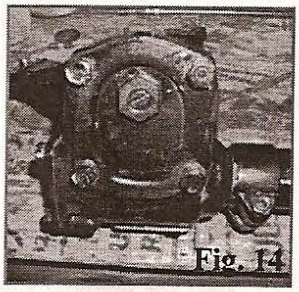
Fig. 14

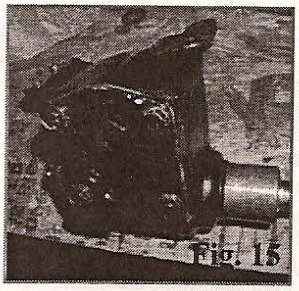
Fig. 15

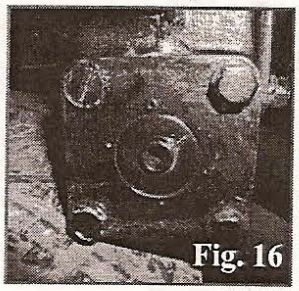
Fig. 16

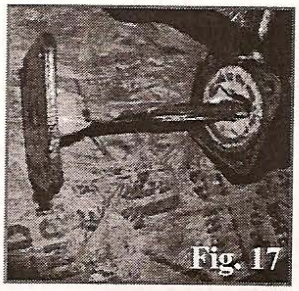
Fig. 17

8. I removed the pitman arm "shaft/sector gear" from the steering box (Fig. 19). **IMPORTANT!!!** There are several spacers of different thickness on this shaft. The bushings in the housing for this sector gear are located such that the sector gear is slightly closer to the worm gear than normal. The spacers are used to position the sector gear further inward, thus decreasing the clearance between the sector gear and the worm gear (Fig. 20). **THIS IS THE ADJUSTMENT PROCEDURE AS DEFINED BY CHRYSLER CORPORATION TO REDUCE STEERING GEAR FREE PLAY**. These spacers will be used later for this adjustment.

9. Using a hammer and block of wood, I tapped on the steering wheel end of the steering gear shaft and drove the front tapered bearing and bearing housing, located on the front of the worm gear, out of the steering box (Fig. 21). Once the bearing was out, I pulled the entire steering gear shaft out of the steering box. I was careful not to lose the rear tapered bearing located on the rear of the worm gear.

10. I removed all the grease from all the components. *When you try this procedure, take the steering housing and sector gear to a machine shop that understands how the steering system works. Usually the bushings are worn and the machine shop will remove the old bushings, machine and install new bushing material and machine the bushing bore to fit the sector shaft (make new bushings).*

11. **THIS IS THE TIME CONSUMING PART, BUT THE MOST IMPORTANT PART.** Once the new bushings were installed, I lightly lubricated all the bearings, new bushings, steering gear, and sector gear with white silicone grease. IMPORTANT!! When you do this procedure - PLACE THE "THICK spacer" on the sector gear shaft with the CHAMFER ON THE SPACER "TOWARD" THE SECTOR GEAR. NEXT - INSTALL THE NEXT THICKEST SPACER ON THE SHAFT, FOLLOWED BY THE THINNER SPACERS (Fig. 22). I then completely reassembled the steering gear and bolted on the side cover. Tightened the adjustment screw on the side cover to take up the end slack in the sector gear and when the screw was snug, tightened up the retaining nut.

12. I then grabbed the end of the steering gear sector shaft with one hand and the steering gear shaft with the other hand. Rotating the steering gear shaft back and forth, I determined how much free play was in the steering gear shaft before the sector gear shaft moved in the other hand. If there was movement, I took off the side plate, removed the sector gear and removed one or two of the spacers (depending on how much free play was felt). Reassembling the steering gear, I tightened the adjustment screw and nut and tested it again. When it felt like there was no free play, I installed the steering shaft outer housing on the steering gear.

13. Putting the steering gear back in the car, I installed all mounting brackets, installed the steering column dash-retaining bracket, and pitman arm on the shaft.

Continued on page 8

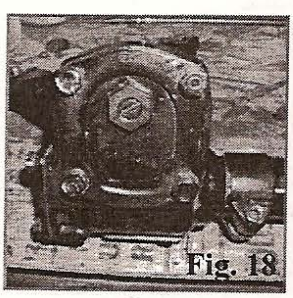
Fig. 18

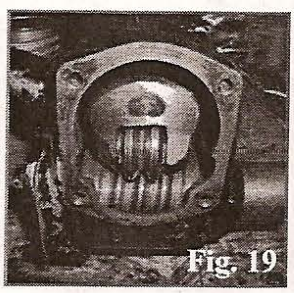
Fig. 19

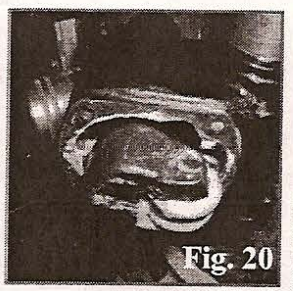
Fig. 20

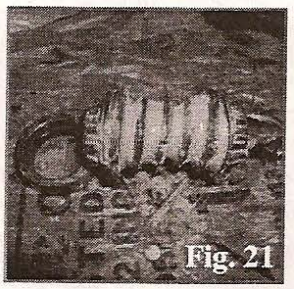
Fig. 21

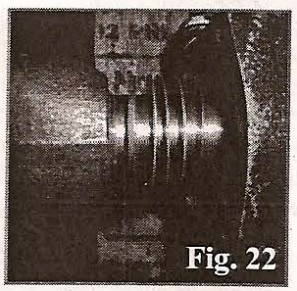
Fig. 22

Steering...Continued from page 5

I grabbed the brake drum; twisted it back and forth to see how much the steering gear shaft rotated. This action puts more force on the gears, to determine clearance, than the bench test. The amount of rotation is the clearance between the sector gear and worm on the steering shaft. If there was movement, I removed the steering gear from the vehicle, removed the side cover, pulled out the sector gear and removed one of the spacers, reassembled the unit, put it back in the car and tried it again. (I did this only one time and everything was satisfactory).

14. Once the proper clearance was set, I removed the steering gear again and placed it up on the bar on top of the radiator. I installed the end cover and horn wire, removed the side cover and filled the steering gear cavity with white lithium grease. When you do this procedure, make sure all gear teeth; spacers, bearings, etc. are covered in grease. *(In olden days...1934 etc. the steering gear heads were filled with 90-wt oil, but now the grease is better).* Once the grease was installed, I bolted the side cover on the steering gear and checked the adjustment screw to be sure all the end slack was removed. Then I tightened up the locking nut and installed all the components back into the vehicle.

Lastly, I road tested the car to check out the steering system.

When you try this procedure I truly wish you...Good Luck.

Editor's note: Our thanks to Gary Frey of Mayer, AZ, for submitting this timely article before we get our cars up to "MoPar" before the National Meet

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mechanical parts for our Airflows. He is always my first (and often best) contact.

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