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GETTING THE AIR OUT! STEERING SYSTEM AIR REMOVAL PROCEDURE

Bleeding the Power Steering System 101:

When steering components are replaced or the fluid in the steering system is drained for some reason, there seems to be a body of literature that recommends just refilling the system; starting the engine; and turning the steering wheel full lock to full lock a few times. After this quick procedure you can just drive away.

In many cases what actually happens is the following; milky colored fluid overflows the reservoir, there is a lot of noise when turning the steering wheel, and/or there is a distinct loss of power assist.

If all that was replaced was a return hose, most likely there will be very little air that will get trapped in the system. However, if you replaced an integral power steering gear in your passenger car or truck (or the assist cylinder in your C2/C3 Corvette) there will be a very large quantity of air inside the new part that has to be replaced by fluid. That air will need to be moved up through the power steering lines, up into the pump, and out by way of the pump reservoir.

Now you can move power steering fluid through the system by starting your engine and turning the steering wheel full lock to full lock. **HOWEVER**, what will happen is that large air bubbles along with power steering fluid will circulate into the power steering pump and will be whipped to a milky froth by the pumping vanes inside the pump. Now you actually have a mixture of hydraulic fluid with millions of tiny air bubbles. You also have a foamy compressible fluid that will expand with increasing fluid temperature. It will overflow the pump reservoir, create lots of steering noise, and will result in a distinct lack of power assist.

Once you have fluid in that condition, it is best to let it sit overnight and let the tiny bubbles combine into larger bubbles and some of them will float up into the pump reservoir. You will then need to refill the pump to replace the space taken by the air bubbles as they come to the surface and back to the atmosphere. You can then start the procedure again.

So I always recommend the following procedure:

With all the components in the power steering system connected and hose connections torqued to specification. Fill the pump reservoir with power steering fluid to the "COLD" mark on the reservoir capstick. Now jack up the front end so that both front wheels are off the ground. Rotate the steering wheel full lock to full lock with the engine OFF. (Be sure to check that the front wheels and tires aren't hitting your jack or safety stands as they move toward full lock in both directions.)

Now what happens is that the piston inside your power gear (or assist cylinder) will act as a pump as you turn the steering wheel. It will slowly move oil and large air bubbles through the system and as they reach the power steering pump, they will rise up into the reservoir and back to atmosphere. You should be able to see large air bubbles rising up through the fluid if you look into the pump reservoir. Refill the reservoir to the COLD mark on the capstick as necessary during the process.

Continue full lock to full lock rotations of the steering wheel until the level of the fluid in the reservoir remains constant and you no longer see air bubbles rising in the fluid. You most likely will have to turn the steering wheel full lock to lock a couple dozen times. Refill one last time to the COLD mark on the reservoir capstick.

Let the car down and start the engine. Now rotate the steering wheel full lock to full lock a few more times. Don't hold at full lock for more than just a few seconds.

Check for any signs of leakage from the components or connections. One last check of the fluid level and then go for a short 10 mile drive. If there is still a minor amount of noise; let the car sit overnight; check the fluid level, refill if necessary; and then go for another short drive. You should be good to go.

One last tip: I also recommend using genuine GM power steering fluid (the stuff available at GM dealers) rather than the generic fluid sold at K-Mart, Pep Boys, NAPA, etc. It is the only fluid that is specifically formulated to operate with GM power steering pumps. The GM fluid is also particularly good at reducing tendencies for the fluid to foam. The current part number for a 32 fl oz container is GM 89020661. There is approximately 20.5 fl oz of fluid in a typical C2/C3 power steering system.

I do NOT recommend using Automatic Transmission Fluid (ATF) in your power steering system. Owner's manuals in the 1960s (and stamped instructions on the top of the power steering reservoir cap) may have recommended ATF but that was before the specifically formulated power steering fluid became available.

GM is recently touting Dexron®-VI as a universal fluid for power steering systems and automatic transmissions. My contacts at Nexteer (formerly Saginaw) indicate that genuine GM power steering fluid is still best.

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