Hydroboost Conversion on my ’77 Cortez.

Background

From the day I picked it up in Indiana, my ’77 Cortez has never had decent brakes. Over time, the only component that had not been rebuilt or replaced was the dual-diaphragm vacuum brake booster unit and the brakes still left much to be desired. Since I was faced with the prospect of sending it and a couple of hundred dollars across the country to be rebuilt, I decided to try converting the Cortez to Hydroboost brakes. I was first exposed to Hydroboost brake systems when I purchased a used ’95 2500 Suburban. With its disc/drum brakes and a hydroboost, I felt it had some of the best brakes of any vehicle I had ever driven.

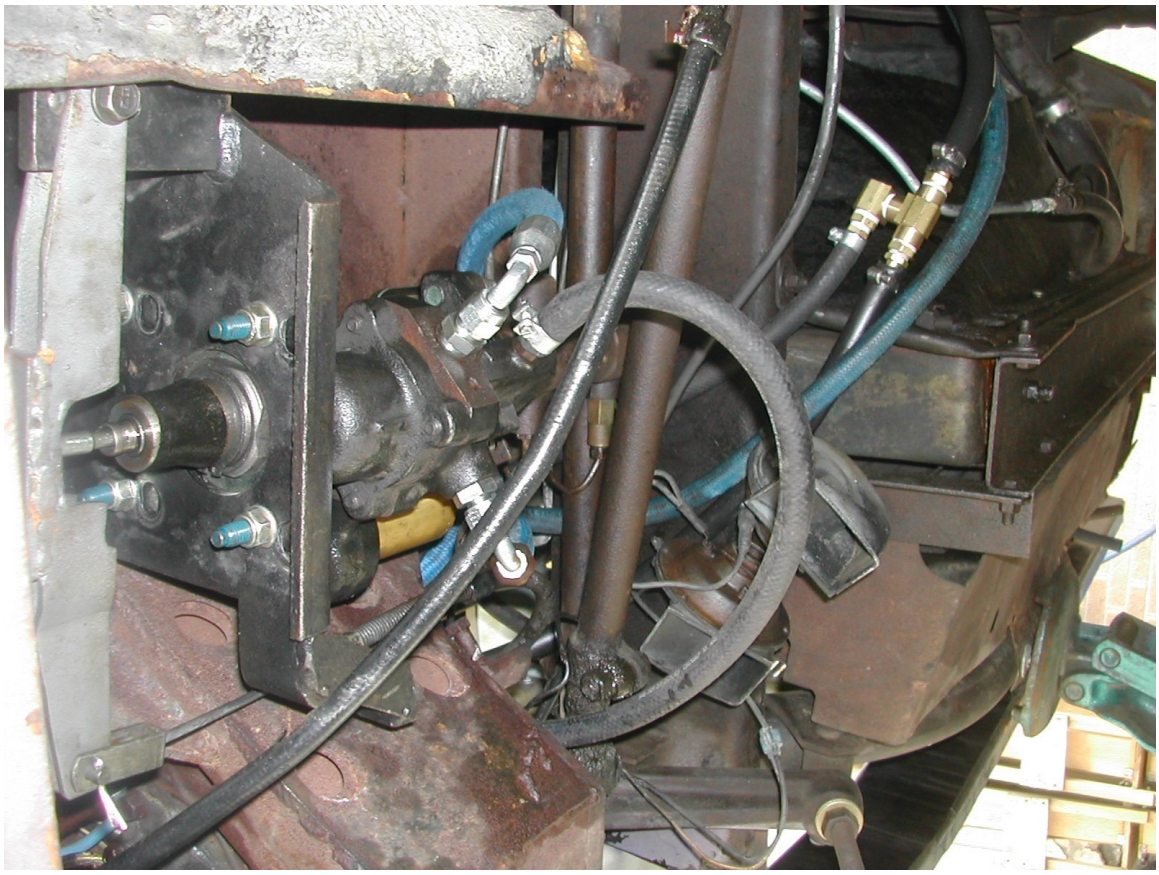
The Process

The first step for me was to acquire a junk hydroboost unit to see if the project was even feasible. After working with the sample, I decided to go ahead with the project. I read everything I could find about hydroboost conversions and purchased a complete hydroboost assembly from a ’99 Chevy C3500 at the local junkyard. I did some rough measurements and it looked as though I could use the entire boost and master cylinder assembly. I removed the whole booster and master cylinder from the Cortez. Note: you must remove one end of the drag link and swing it out of the way to be able to remove and install the brake unit. I made two measurements. First - the distance from the back of the bracket to the side of the step well and second – the distance from the cable mounting bracket to the pin in the cable clevis. I removed the old parts from the bracket and carefully measured, marked, and drilled the bracket to accept the hydroboost assembly. Note: the hydroboost is typically mounted with the fittings facing up. Because it would fit the bracket better with the fittings facing down, that is how I drilled the bracket. I contacted a major vendor of hydroboost conversions and he advised me there was no problem with using it in the inverted position.

The one thing I noticed is that the face of the casting has a gap cast init on the original bottom so any leakage from the hydroboost or the master cylinder can simply drain out. I cut a narrow groove on what is now the bottom side to retain a drain. I bolted the hydroboost to the bracket. Next I used the measurement I took under the coach between the bracket and the step well and used it to shorten the input rod on the hydroboost - making it 3/8in shorter than the measured distance. Double check before you cut. If it ends up too short, you will have to order a replacement input piston and rod assembly. I then tried a test fit of the assembly and found the new master cylinder was about ½ inch longer that the original and hit against the torsion bar so it was back to the bench with the whole unit. I pulled the new master cylinder off the hydroboost and the old one off the vacuum booster.

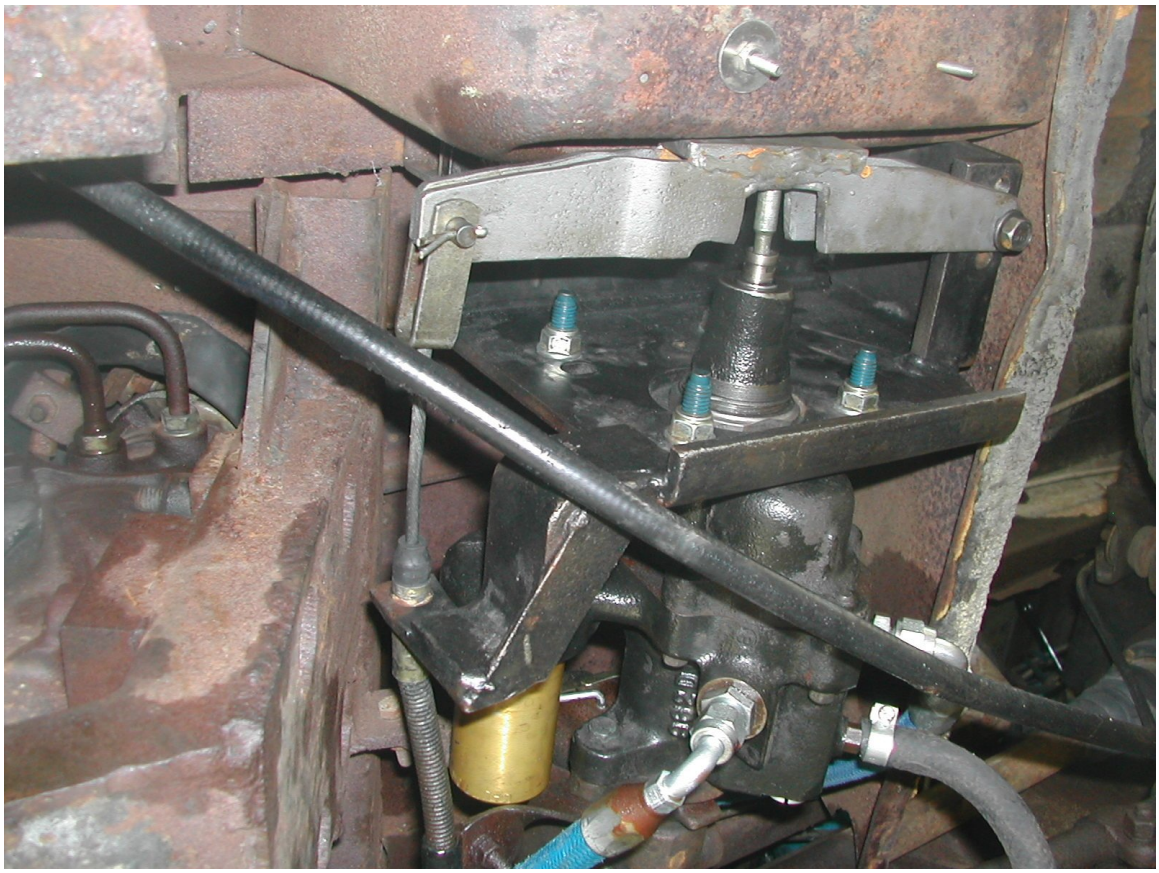
Good news and bad news. Good news - the old master cylinder bolts up to the hydroboost perfectly. Bad news – the actuating rod on the hydroboost is approximately 1.5 inches shorter than the one on the vacuum unit. I had to stop and create a spacer out of a ½ inch diameter bolt. I adjusted the length of the spacer to where the hydroboost depressed the

M/C piston about .050 in., which was similar to the distance observed when I removed the new M/C from the hydroboost.

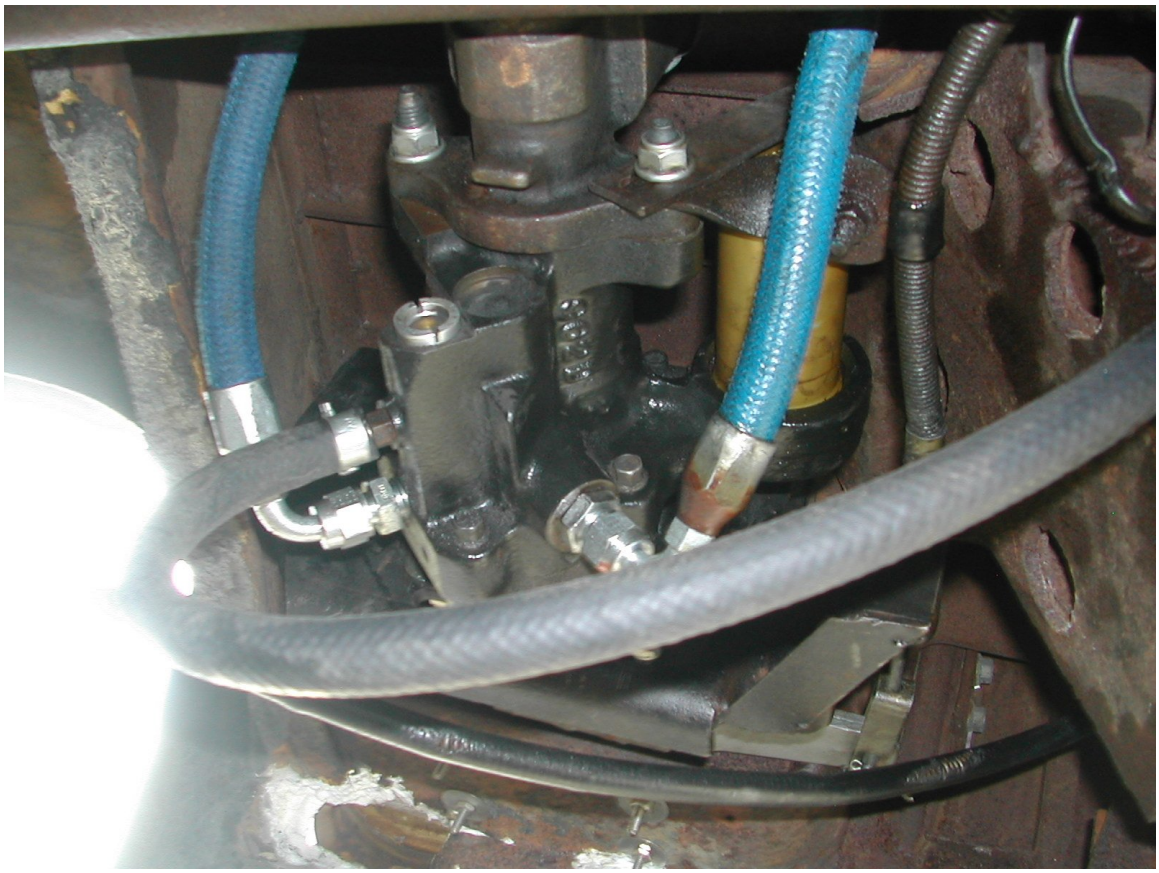


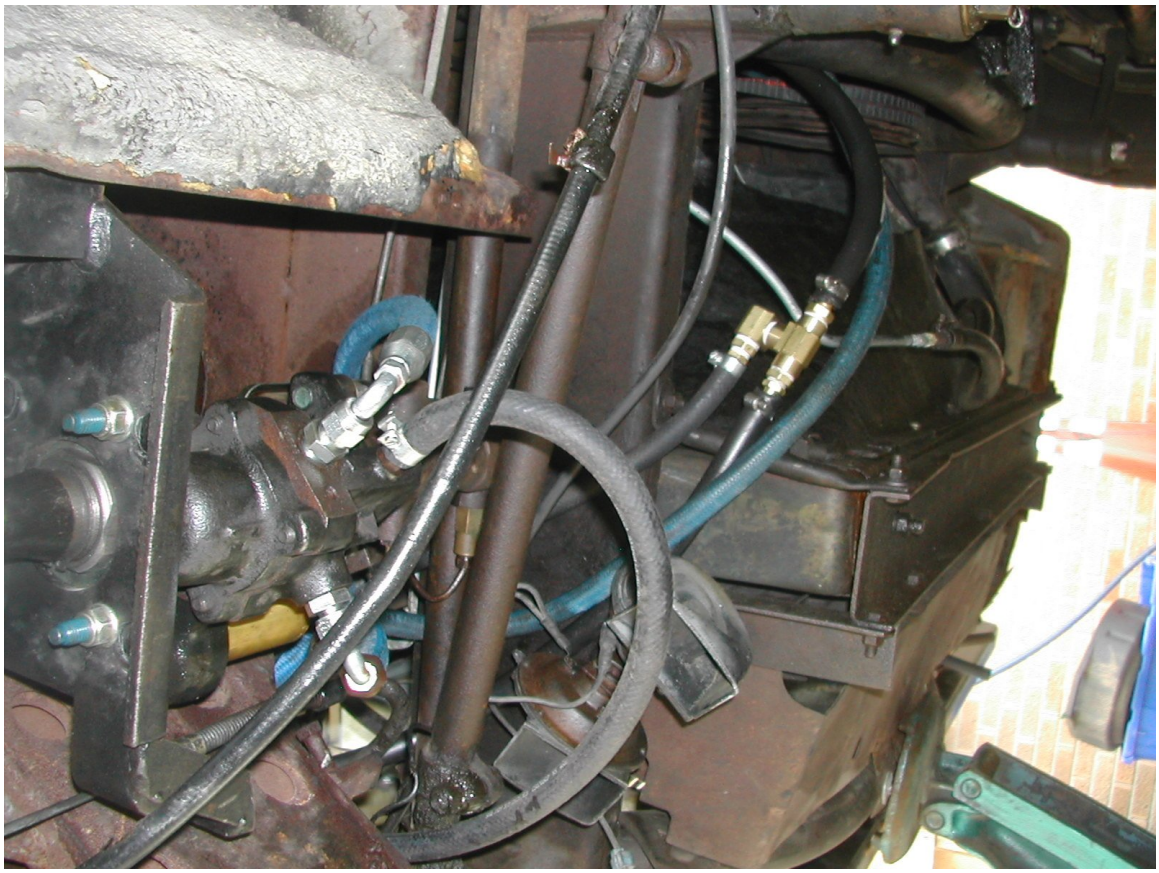
Another test fit came out OK so I turned my attention to the actuating levers. The hydroboost has an extension on the input side that does not exist on the vacuum unit. Since the levers will be pushing against a rod now, I cut a piece of 3/8in plate about 2 ½ inches long and wide enough to fit between the assembled levers. I drilled a clearance hole in the center to go over the actuating rod. The rod will change angular position as the levers move in and out so I elongated the hole slightly to accept that movement without binding. I cut a second piece about 4 inches long and as wide as the assembled levers. I took the arms and held them roughly parallel to the bracket and with the end in line with the old pivot pin hole. I then located the cut piece with the hole over the straightened hydroboost input rod and flush with the adjusting arms. I clamped it in place and welded the corners to the levers. I then took the longer, wider piece, centered it over the piece now inside the two arms and welded it securely to both arms. This plate serves as a bearing point for the input arm and also strengthens the arms to compensate for the sections we will remove from them shortly. Next, I held the lever assembly on the bracket. The hydroboost actuating rod was in its hole and the hole where the cable attaches was held the measured distance from the bracket where the cable would be fully extended. I then marked a new pivot hole on the side of the bracket (roughly an inch away from the original). With the bracket still comfortably in the vise, I drilled a new hole. With the lever in place and the pivot pin through the hole, I eyeballed the necessary

cutout on the lever so it would clear the extension on the hydroboost when the lever was fully depressed. I removed the necessary pieces with an air cutoff tool. I have found it much easier to install the assembly with the lever removed so I bolted the new system in place and reconnected the brake lines. I fitted the lever in place and attached the clutch cable.



It is now time for the plumbing. I had purchased 4 feet of Aeroquip #6 power steering hose, 2 90 degree #6 AN fittings and adapters to convert the hydroboost from 16mm and 18 mm O-ring fittings to #6AN. I chose Aeroquip because the existing pressure line from the pump to the steering gear was that brand. I disconnected the pressure line from the steering gear and removed the fitting from the hose. I cut a couple of inched off the hose and installed one of the new 90-degree fittings on it. I routed the hose and attached the fitting to the inlet of the hydroboost (the side with one fitting). I installed the original fitting on the new piece of hose. I attached it to the gear and routed the hose to the bypass fitting on the hydroboost. I cut it to length and installed the other 90 and attached it to the hydroboost. I put a Tee made from some brass fittings and placed it conveniently in the existing return line. I used a piece of bulk return hose to connect the hydroboost return fitting to the Tee. I repeated the process of filling the pump and starting the engine briefly a few times until the system was full and the bubbles somewhat cleared. I then used a pressure bleeder to completely bleed the brake system. I got everything out of the way and carefully backed up the Cortez. I pressed the brake pedal and shook myself because it stopped suddenly and completely. The next day I found I had to add a bit more fluid because all of the tiny air bubbles had migrated out.





The Results

With a full reservoir, I headed around the neighborhood for some testing. About a block away and doing about 25 mph, I pushed the pedal fairly hard and, for the first time since I have owned it, the rear wheels locked up. I've put a few dozen miles on the system including some at freeway speeds and the system seems smooth, consistent, and strong. I have to save up a few dollars to put insurance back on the Cortez before I do any more but I'm anxious to be on the road again.

Now that the now-hydroboosted system is working correctly, Volume 2 will be converting the front to disc brakes.

Big Jim