

- Remove the fluid from the modulator reservoir. (photo #2) Operate the pump momentarily and see if fluid is coming back into the reservoir from the solenoid ports located in the modulator reservoir. This will indicate the solenoids are stuck open and a new modulator is needed.

(do not run the pump excessively or you could over pressurize the system. The system has a high pressure check valve to relieve high pressure, but the pressure switch operation could be affected).

On most models you can remove the reservoir to get a better view of the tops of the solenoids.

- If no fluid comes from the solenoids and the pump runs, but will still not pressurize the accumulator the pump is bad.
- If the pump does not run, troubleshoot the pump electrical.
- If you discover metal particles in the bottom of the ABS reservoir while checking fluid, indicates major pump problems. Metal contamination may not flush completely out of the solenoids. The pump will need to be replaced first to find out if the modulator can be flushed. Make sure you clean out the ABS reservoir of any metallic particles before replacing the pump and flushing the system. If the modulator solenoids continue to leak, the modulator assembly must be replaced. This procedure can get very expensive very quickly. Make sure your customer knows what he/she is getting into first.

DTC 2

A very common problem in all models is Code #2. Somebody probably drove the car around with the hand brake on. Reset ECU and test drive, if code #2 is reported from the ECU. Also check the master cylinder low fluid level switch in the cap. If the fluid is low or the switch is bad, will cause code #2.

If you get a wheel sensor code after driving, check wheel speed sensor pulse rings and sensor air gaps by rotating the wheel and checking the air gaps all the way around the pulse ring. Also check for damaged wiring to the wheel sensors. We've even seen the replacement axles installed without pulse rings on them.

If you ever have a modulator that is leaking externally from its body, it is best to REPLACE IT. Some of the models have had leaks at plugs in the modulator body, but not all of these plugs can be tightened or turned. Check for any manufacturer service bulletins before turning any of these plugs.

Also, Most of these systems were designed to build 3000-5000 PSI so take precautions when working on them. At least wear some face protection. Anytime you are going to remove any accumulator lines or the pump, you must bleed the system pressure. When bleeding the system pressure on the models with the large accumulators you should get around 120cc of fluid.

Figure 7

You will need a "T" handle wrench like the one shown in *Figure 7* to bleed and measure fluid accurately.

The fluid may be foamy so let it settle to read the actual level.

Check the accumulator fluid service amount in the service manual if the car you are working has components different than this.

The later model pumps for these systems are much stronger. The pumps and accumulators are mounted to the modulator body. Accumulators are cylindrical.



The pumps build pressure much faster and operate for a shorter amount of time. The ECU monitors the ABS pump motor for long and short run times/cycles and will set a code if out of specification (15-40 seconds max depending on the model). Otherwise they operate about the same only with a lot less space and weight.