

### Low or Soft Brake Pedal Diagnosis

Before beginning the following procedure check to make sure pedal free play is approximately 1/2" and air gap from booster pushrod to master cylinder piston is approximately .015"

- 1) Remove both brake lines from master cylinder. Install plugs in both ports of the master cylinder. Take care not to damage brass seats in master cylinder. Plugs with tapered seats can be purchased at your local parts store.
- 2) Once plugs are installed go into vehicle and press the brake pedal down for 30 seconds using moderate force. The brake pedal should be at the top of its travel and not move at all.
- 3) If brake pedal seems spongy or pushes back at you while being applied you most likely have air in the master cylinder. Remove the master cylinder from car and re bench bleed following instructions in your kit.
- 4) If while you are holding pressure on the brake pedal it seems to "sink" or "creep" to the floor you have a faulty master cylinder. It will need to be replaced. Bench bleed new master cylinder and re install in vehicle. Perform steps 1-4 to ensure new master is properly bleed and functioning. If so, hook lines back up to master cylinder and re bleed the rest of the brake system. If pedal feels normal proceed to test drive and pad/rotor bed in procedure.
- 5) If pedal is at the top of its travel and firm the master cylinder is functioning as designed. Re install the brake lines into master cylinder and re bleed brake system.
- 6) Clamp off all flex hoses on vehicle. You will have one flex hose at each front wheel and either one from the body to the rear axle OR one at each rear caliper. Take care not to damage lines. The use of hose clamps is recommended.
- 7) Once again go into the car and press brake pedal. It should feel the same as in step #2. No movement other than mechanical free play in pedal assembly. If this is the case you know the system is good from the master cylinder to the clamps at the flex hoses and you can skip step 8.
- 8) If the brake pedal is spongy or soft you either have an external fluid leak or air trapped in a point between the master cylinder ports and the clamps. Repair any leaks, Re bleed system and re test by following step 6-8.
- 9) If pedal feels firm remove one clamp and press the brake pedal. Take note as to how it feels. Re clamp that hose and remove one other clamp and take note as to how the pedal feels again. Work your way around the car testing only one brake circuit at a time.
- 10) Once you find the circuit that lets the pedal move the most you have found the problem circuit. Inspect the brake circuit in question for either an external fluid leak, excessive mechanical movement of caliper pistons or wheel cylinders, or air trapped in the circuit. Take this time to make sure the brake bleeders are at the top of the caliper so air can escape and all brackets are correctly aligned and in the proper locations.
- 11) Perform necessary repairs/adjustments and re bleed and re test as needed.

### Vacuum Brake Booster Testing and Diagnosis

This procedure will require the use of a hand operated vacuum pump with a vacuum gauge. If you do not own one it can often be rented or borrowed from most "big box" parts stores. (Note: 18"HG is the minimum engine vacuum at idle in gear to effectively operate a vacuum booster

- 1) Remove vacuum hose from check valve on booster. Place hose from vacuum pump onto check valve and draw booster to 20" of vacuum.
- 2) Let booster sit with vacuum applied for 5 minutes. If vacuum does not stay steady at 20" it is faulty and needs to be replaced. If vacuum does hold steady at 20" proceed to step 3.
- 3) With 20" of vacuum in booster depress brake pedal once and release it. The booster should transfer some but not the entire vacuum in reserve. Depending on how hard the pedal is depressed it is normal to see 5-10" of vacuum depleted from reserve. The most important thing is to ensure the booster does transfer vacuum but does NOT transfer the entire vacuum in its reserve. If vacuum remains at 20" OR goes to zero the booster is bad and will need to be replaced. If vacuum transfer is within the above parameter proceed to step 4.
- 4) Once again draw booster down to 20" of vacuum. Go inside car and depress brake pedal and hold down for 30 seconds. You should see the gauge drop slightly and then hold steady. Vacuum should stay steady as long as you are holding the pedal down. If vacuum drops while pedal is being held down the booster is faulty and will need to be replaced.