



BRAKE BOOSTER AND MASTER INSTALLATION

- Master Cylinder Bleeding
 - Master cylinder is to be mounted in a vice or similar
 - Lines must be run from the ports to the reservoir of the cylinder and be under the level of fluid
 - Use short, slow strokes of the master cylinder until all air is expelled from the master cylinder
 - Lines should be premade in car so master cylinder is installed as soon as possible after bleeding
 - Brakes must be bled from furthest away brakes to closest
 - Bleeders must have clear line attached for bleeding
- Brake Bleeding
 - Only new fluid must be used
 - Master cylinder must be bench bleed before installation
 - Cleanliness is very important when working with brake fluid and bleeding brakes
 - Fluid level must not drop below roughly half way during bleeding
 - Calipers must be mounted so bleed nipple is at highest possible point
 - Always clean up brake fluid spills – fluid is corrosive
 - Fluid level should be roughly $\frac{3}{4}$ full when finished – overfilled reservoirs can cause leaks and dragging brakes
- Installation of Brake Booster
 - If converting from manual brakes to power brakes, pedal ratio may have to be modified
 - In general, manual brakes operate at 5-7:1 and power brakes 4-5:1
 - Generally 1-1 $\frac{1}{2}$ " lower than the factory mounting point
 - This is very important to get the correct assistance and pedal feel
 - Engine must have a minimum of 18in vacuum otherwise an electric vacuum pump may be necessary
 - Correctly adjust pedal clevis to have roughly $\frac{1}{4}$ " free play
 - Torque booster to firewall nuts to 20-25ft-lb
- Installation of Master Cylinder
 - Master cylinder should be installed as soon as possible after bench bleeding to ensure no air enters system and for easy bleeding
 - Torque master cylinder to booster nuts to 20-25ft-lb
 - Adjust booster pushrod to have .020" clearance between pushrod and master cylinder piston – supplied master cylinder insert may be required
 - No sealing tape is required on any brake fittings
 - Correct line flares must be used – double flare vs single

BRAKE SYSTEM TROUBLE SHOOTING

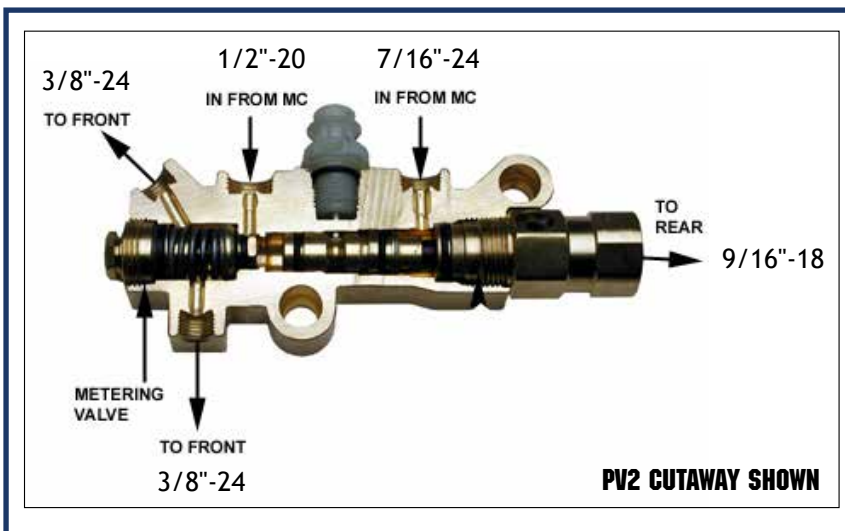
- Hard Pedal
 - Insufficient vacuum
 - Too small of booster
 - Faulty booster/vacuum valve
 - Incorrect pedal ratio
 - Too large master cylinder bore
- Soft Pedal
 - Air in system
 - Incorrectly adjusted shoes on drum brakes
 - Leaking wheel cylinder/caliper/master cylinder
 - Residual valves may be required – normally with master cylinder under floor
 - Poor condition brake lines
 - Too small master cylinder bore
 - Faulty booster
 - Warped rotors/misaligned caliper
- Too Much Pedal Play/Low Pedal
 - Incorrectly adjusted booster pushrod, brake pedal pushrod or drum brakes
 - Incorrect pedal ratio
- Dragging Brakes
 - Incorrect pedal/booster pushrod or brake adjustment
 - Faulty brake booster
 - Seized caliper/wheel cylinder
 - Overfilled master cylinder

PV2 / PV4 PROPORTIONING VALVE KIT INSTALLATION INSTRUCTIONS

(LEFT SIDE KIT USED FOR EXAMPLE, BUT INSTRUCTIONS APPLY TO ALL KITS)

INCLUDED IN THIS KIT:	
1	Proportioning Valve
2	Pre-bent lines
1	Mounting bracket
2	5/16-18 bolts
2	washers-flat
2	washers-split locking

WARNING Proper operation of your brakes is essential for your safety and the safety of others. Any brake service should be performed **ONLY** by persons experienced in the installation and proper operation of brake systems. It is the responsibility of the person installing any brake component or kit to determine the suitability of the component or kit for the particular application. **DO NOT DRIVE WITH UNTESTED BRAKES!**



INSTALL LINES AS SHOWN IN DIAGRAM:

The most common proportioning valve plumbing is shown. An alternative plumbing method is to plug off the top front line and have the bottom front line go to a "T" fitting. From the "T" fitting, the front lines are then split off to the left and right calipers.

NOTE: AFTER INSTALLATION REFER TO MASTER CYLINDER MANUFACTURER INSTRUCTIONS FOR PROPER BLEEDING

TESTING THE PROPORTIONING VALVE FOR PROPER OPERATION:

1. Use a test light by attaching a clip to a positive contact on the vehicle and touch the point of the tester to the electrical connection of the combination valve. If the light does not come on, the valve system is operation correctly and no further testing is required.
2. If the light does come on, this indicates that the pressure differential valve is stuck in the front or rear position.
3. Bleed the brake system to determine if the front or rear lines are blocked off. Set up one front wheel and one rear wheel for bleeding at the same time. Crack both bleeder screws and gently pump the pedal a few times. The blocked side will trickle fluid out when the bleeder screw is cracked and the pedal pressed. An unblocked line will squirt fluid out the bleeder.
4. The lines that are clear must be left open and the blocked lines should have the bleeder screws tight to cause pressure to build up on that side. Be sure to use the standard bleeding procedures to prevent air from entering the system.
5. Slowly press the pedal with steady pressure a number of times until the light goes out; this will center the differential valve. You may also hear a pop come from the proportioning valve. This is the metering valve returning to its equalized position. When the light goes out, close the bleeder screw.