



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