

# INSTALLATION INSTRUCTIONS

## 5-LUG REAR CONVERSION KITS

M-2000-10SB, M-2000-11SB,  
M-2000-12SB, M-2000-13SB

1979-93 FORD MUSTANG

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Please take the time to read and carefully follow these instructions to insure the ease of your installation as well as the proper performance of the complete system.

Before beginning your installation, please verify you have received all the parts indicated on the packing slip. If you believe anything to be missing or incorrect, please call our Customer Service Department.

To assure your installation will go safely and smoothly, have the following items on hand to assist you:

**JACK & JACK STANDS**  
**LUG WRENCH**  
**TORQUE WRENCH**  
**SOCKET SET**  
**BRAKE CLEANER**

**WRENCH SET**  
**TUBE WRENCHES**  
**MALLET**  
**WHEEL BEARING GREASE**  
**GEAR OIL**

**This kit uses the following pads:**

**FMSI#: D-347**

**TIP: BEFORE BEGINNING INSTALLATION, SPRAY ALL FITTINGS & FASTENERS WITH PENETRATING OIL.**

### 1. Drum Brake Removal

- a) Raise the car until the tires and wheels clear the floor and support the car on jack stands. Remove the tires and wheel assemblies from the drum.
- b) Pull the brake drums off the axle shafts . If the brake drum will not come off easily, retract the shoes by inserting a narrow screwdriver through the adjusting slot in the backing plate and back off the adjusting screw.
- c) Remove the brake shoes and all the hardware.
- d) Disconnect parking brake cable from the actuator and pull through the backing plate after compressing the retaining clip.
- e) Disconnect the rigid brake line from the back of the wheel cylinder. Always use a tube wrench on brake lines so not to strip the tube nut.

### 2. Removal of the Axles & Backing Plates

- a) Remove differential cover and drain all fluid into a drain pan.
- b) Working through the open case, remove the pinion shaft lock bolt. (7mm hex)
- c) Push pinion lock shaft out of the rear end housing. **Photo 1**
- d) Push the axle shafts inward and remove the “C” locks from the ends of the axle shafts.
- e) Carefully pull the axle shafts out of the rear end being careful not to damage the axle bearings or seals.
- f) Remove the four nuts and bolts that secure the backing plates to the rear end housing and remove and discard the backing plates.

### 3. Installation of Caliper Mounting Brackets

- a) Caliper brackets are marked “Left” and “Right.” Be sure to install them on the correct sides.
- b) Install the brackets so the calipers will point towards the rear of the car. The stepped part of the bracket should step in towards the center of the car. **See Photo 2**
- c) Secure the brackets to the axles using the 3/8”-24 x 1-1/4” bolts and nuts supplied with the kit.

### 4. Installation of Axles Shafts and Rotors

- a) Install the new axles shafts, C-locks, lock pin and lock bolt in the reverse of removal.



**BE SURE TO INSTALL A NEW DIFFERENTIAL GASKET AND REFILL THE REAR END WITH THE PROPER GEAR OIL TO THE PROPER LEVEL.**

- b) Clean the rotors thoroughly with brake cleaner to remove the protective packing coating.
- c) Slide the rotors into position on the ends of the axle shafts and secure them with at least one lug nut.

### 5. Caliper Installation

- a) The calipers are marked “Left” and “Right”. Be sure to install them on the correct side.
- b) Place caliper over the rotor and secure it to the mounting brake using the 12mm bolts

supplied. Torque the bolts to 80-100 ft / lbs. The bleeder screws should be pointing up and the parking brake levers will point down. **Photo 3**

## 6. Inlet Tube and Support Clip

- a) Attach brass “banjo” fitting with special hollow bolt and two (2) copper washers. Be sure to install a copper washer on each side of the brass block. Tighten to 20-30 ft/lbs.
- b) Attach rigid caliper inlet line to brass fitting and secure to axle with sheet metal clip and screw. Use existing hole, clip and screw that secured original brake tube to axle housing. Attach brass union to line. **Photo 4**
- c) Connect original axle brake line to brass union. Be sure to use tube wrenches. You will need to hand bend original line so that it will reach caliper line neatly. Be sure not to kink the line. Use a tube bender. **Photo 4**

## 7. Parking Brake Cables

- a) Remove old parking brake cables.
- b) Install new cables (provided in kit) in the same manner as original cables. Make sure that housing “snap clips” are toward the front of the car. Route cables through floor pan gussets and assure that clips are securely seated (snapped) in floor pan holes, as in original installation.
- c) Route cable over guide grooves and then to parking brake lever (under console) as in original installation at one end and to caliper parking brake lever at the other end.
- d) Attach parking brake cables to caliper parking brake levers:
  - 1) Push cable housings through holes in cast loop of each caliper and secure with “e” rings supplied.
  - 2) Engage ends of cables into slots of caliper parking brake levers.

## 8. Master Cylinder



**NOTE: Mustangs, model years 1987 and later, are delivered with master cylinders having a smaller output capacity and metric fittings. When converting to rear discs, a larger master cylinder must be installed to prevent a “spongy” brake pedal condition. To prevent this, a larger capacity cylinder has been provided in the kit. Since this master cylinder has SAS ports, a line adapter kit has also been included. Installation is as shown in Photo #5.**

### Follow instructions for 1987 and later cars as follows:

- 1) Remove three brake lines from the existing master cylinder. Note that one line is on the bottom of the unit.
- 2) Remove the mater cylinder from the booster, save lock nuts, discard original master cylinder. Make sure that no brake fluid is allowed to contact paint.
- 3) Remove two existing brake lines from distribution block, discard lines. Use a six point tube wrench.
- 4) Connect adapter TEE (provided) to third brake tube. This is the tube which was originally connected to the bottom of the master cylinder. Do not tighten fittings at this point.



**NOTE: Master cylinder must be bench bled prior to installation.**

- 5) Install new master cylinder on booster and secure with original lock nuts. (Installation is tight but will fit).
- 6) Install “short elbow tube” from adapter TEE (female nut) to larger port of the new master cylinder (male nut).
- 7) Install line from distribution block to adapter TEE.
- 8) Install line from distribution block to smaller port of the master cylinder.
- 9) Securely tighten all fittings before filling and bleeding hydraulic system.



**BE SURE TO CHECK FOR LEAKS AT ALL CONNECTIONS WITH THE PEDAL APPLIED, FOR MAXIMUM LINE PRESSURE, BEFORE DRIVING VEHICLE!**

- 10) For all model year master cylinders: After installation is complete, the pedal height and firmness may be adjusted for “best feel” by slightly shortening or lengthening the booster output push-rod (one or two turns maximum). This adjustment can be made without breaking the hydraulic lines. However, care must be taken that brakes release properly when pedal is released. A dragging or locked-up brake is the result of an over length push rod.

#### **9. Distribution Block and Proportioning Valve**

- a) Unscrew plug from front side of distribution block. **BE CAREFUL** - it is spring loaded. Inside the unit is a spring, spring seat and piston *Illustration #1*. Pull out spring and piston (use needle nose pliers). Remove U-cup and spring from piston and discard.
- b) Reassemble using only the bare piston. Screw plug back into block. **BE SURE TO LEAVE OUT SPRING AND U-CUP SEAL, BUT SEAL UNDER PLUG MUST REMAIN.**



**NOTE: BE CAREFUL THAT ALL HYDRAULIC COMPONENTS ARE KEPT CLEAN AND FREE OF DEBRIS INSIDE AND OUT. REMEMBER, DIRT IS THE ENEMY OF HYDRAULIC SYSTEMS AND WE WILL NOT BE RESPONSIBLE FOR SYSTEM FAILURES DUE TO UNCLEAN INSTALLATIONS!**

#### **10. Filling and Bleeding system**

- a) It is advisable to replace the brake fluid if the color is brown or muddy. This is due to water that has been absorbed by the fluid which will eventually corrode the brake lines and master cylinder. This absorbed moisture can also cause a vapor lock situation under extreme braking conditions. Flush system with clean brake fluid and replace with a good grade of disc brake fluid. DOT 3 or DOT 4 fluids are acceptable.
- b) The simplest and most effective way to bleed your brakes is to use the gravity bleeding approach as follows:
  - 1) With calipers installed, make sure all fittings are tight and master cylinder is topped off.
  - 2) Open one bleeder screw at a time starting at the wheel farthest from the master cylinder and working your way back around the wheel closest to the master. With bleeder screw open, observe bleeder. At first the fluid will begin to escape

with intermittent air bubbles. When the air bubbles stop and a steady flow of fluid is observed for several seconds, close the bleeder valve and move on to the next wheel.



**MAKE SURE TO KEEP A CLOSE WATCH OVER THE FLUID LEVEL INSIDE THE MASTER CYLINDER DURING THE BLEEDING PROCESS. NEVER LET THE RESERVOIR RUN DRY. ALWAYS KEEP IT AT LEAST 1/3 FULL.**

- 3) After bleeding all four wheels and topping of the master cylinder make 20-30 applications of the brake pedal. If a hard pedal is experienced, no further bleeding is required. If pedal is spongy, repeat bleeding process until a hard pedal is achieved.
- 4) With all bleeding complete, there should be approximately 3/4" to 1" of end play.
- 5) Power brake cars will experience a "drop off" of the pedal when the engine is started. This is a normal condition that signifies the booster is working.
- 6) Pedal end play can be adjusted under the dash on non power cars and between the booster and master on power brake cars.

## 11. Parking Brake Adjustment

- a) Advance pistons of calipers so that clearance between pads and rotors is 1/32-1/16". Piston should be advanced using hydraulic system instead of parking brake levers. About 40 pumps of the pedal are required to extend the pistons to the correct clearance.



**IF PISTON HAS BEEN EXTENDED TOO FAR, TURN PISTON BACK INTO CALIPER. IF DESIRED, USE SPECIAL TOOL AVAILABLE AT MOST PARTS STORES. A PAIR OF NEEDLE NOSE PLIERS WILL ALSO WORK.**

- b) Pull up parking brake handle one click.
- c) Tighten cable at level until lever on caliper just begins to leave the "stop" (both sides.)
- d) Release parking brake handle. There should be no drag.



**NOTE: 1987 AND LATER MUSTANGS INCORPORATE A SELF ADJUSTING PARKING BRAKE MECHANISM. IF THIS SYSTEM WILL NOT ALLOW ENOUGH ADJUSTMENT ON YOUR CAR FOR PROPER PARKING BRAKE OPERATION, AN ADJUSTABLE CABLE MAY BE PURCHASED DIRECTLY FROM FORD MOTORSPORT AS PART NO. M-2810-A.**

## FINAL INSPECTION

- a) Once a hard pedal is achieved, all fittings and connections must be inspected to make sure there are no leaks. Also check the level in both reservoirs of the master cylinder and top off if needed.
- b) Put wheels back on the car and turn wheel by hand to insure that the wheel spins freely and does not interfere with any brake components.
- c) When you are sure there are no interferences and the pedal is firm, torque the lug nuts and lower the car back onto the ground. Test drive the car and apply the brakes frequently to seat the pads.

**NOTE: DO NOT USE ANTI-SQUEAK ADHESIVE ON BACKS OF PADS. THIS WILL DEGRADE THE PERFORMANCE OF THE CALIPER!**

**DO NOT DRIVE IN TRAFFIC UNTIL THE BRAKES SAFELY STOP THE CAR A SAFE DISTANCE WITHOUT A SPONGY PEDAL FEEL!**

**BRAKING TESTS SHOULD ALWAYS BE DONE IN A SAFE OPEN AREA**

**NOW ENJOY TRUE PERFORMANCE BRAKING!!**

### **REPLACEMENT PARTS APPLICATION**

The calipers and brake pads used in this conversion kit are the same as those used from the factory on 1987-88 Ford Thunderbird Turbo Coupe. If you have a problem locating the correct replacement pads, have your parts store reference the FMSI #D347. If you should need replacement rotors in the future, contact your distributor.



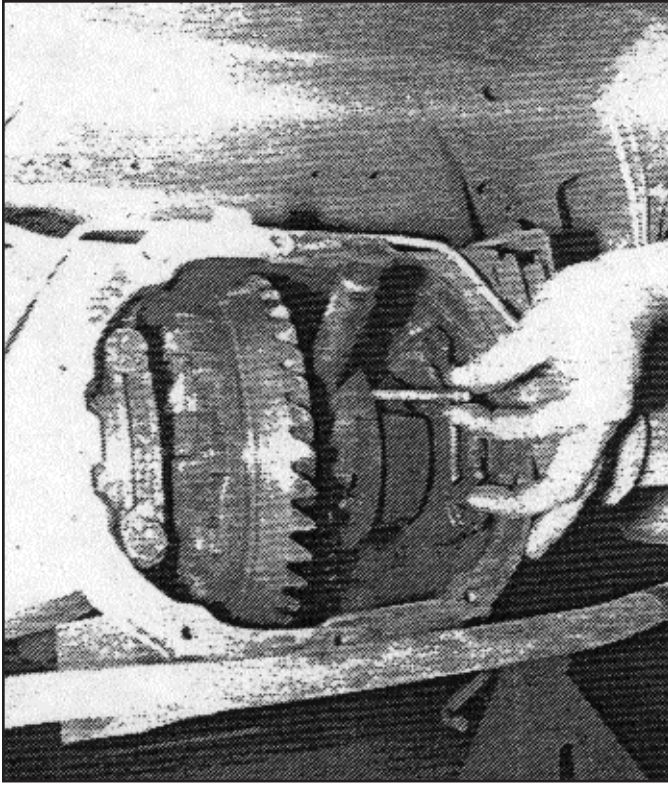


Photo #1

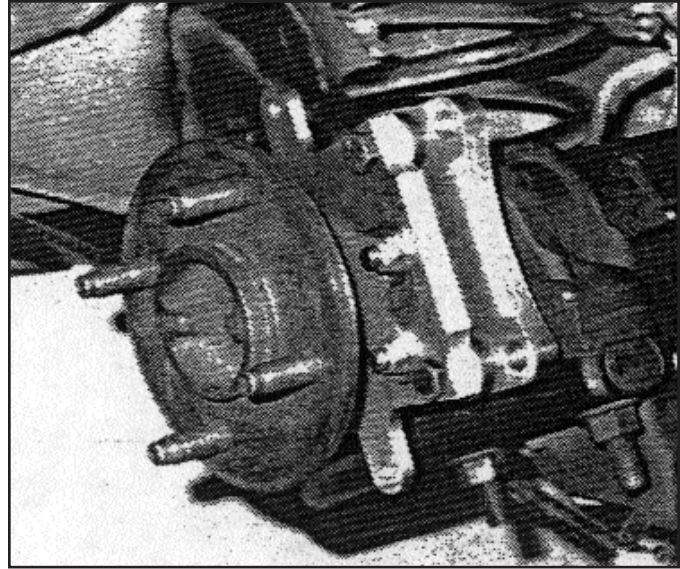


Photo #2  
Caliper mounting bracket is now a casting.

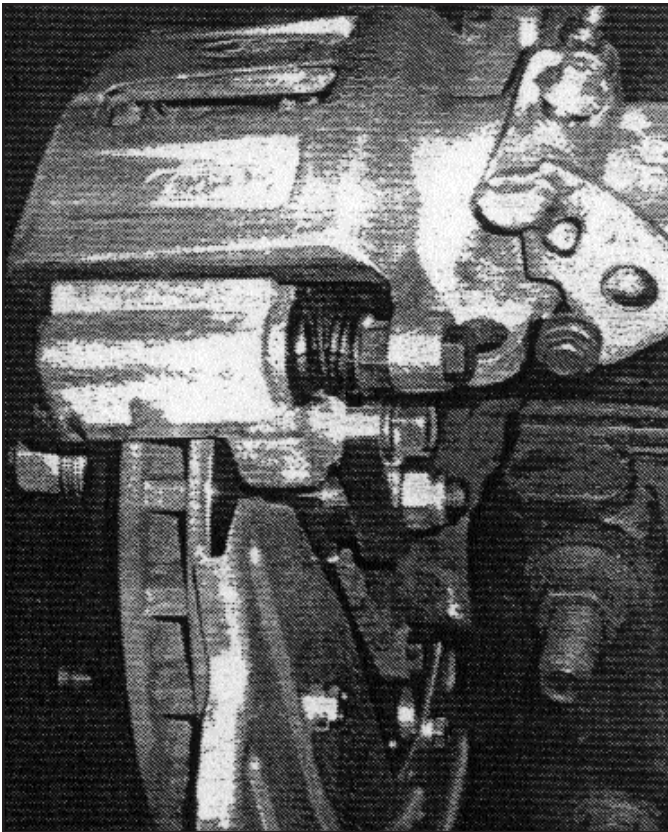


Photo #3

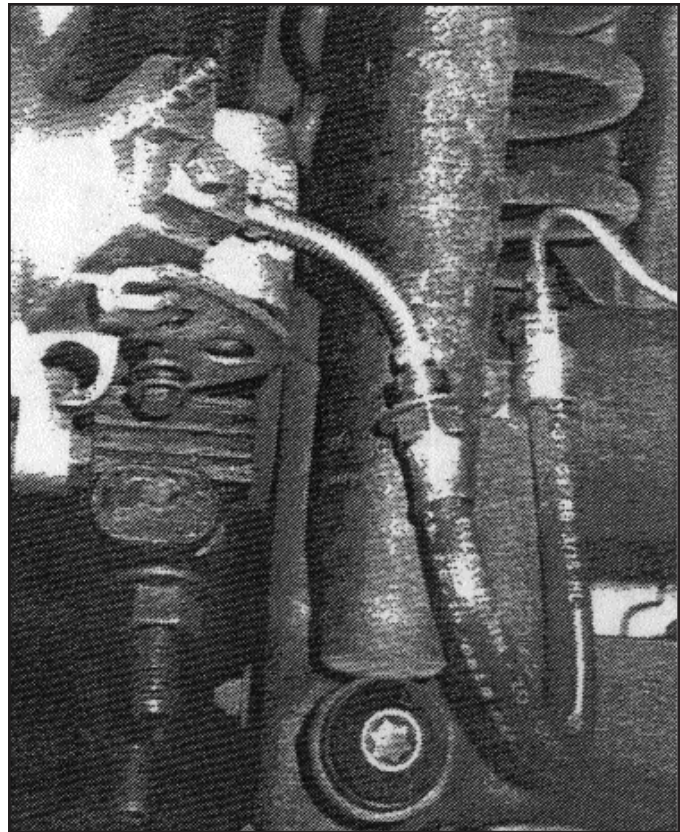


Photo #4  
Caliper inlet line is now rigid.



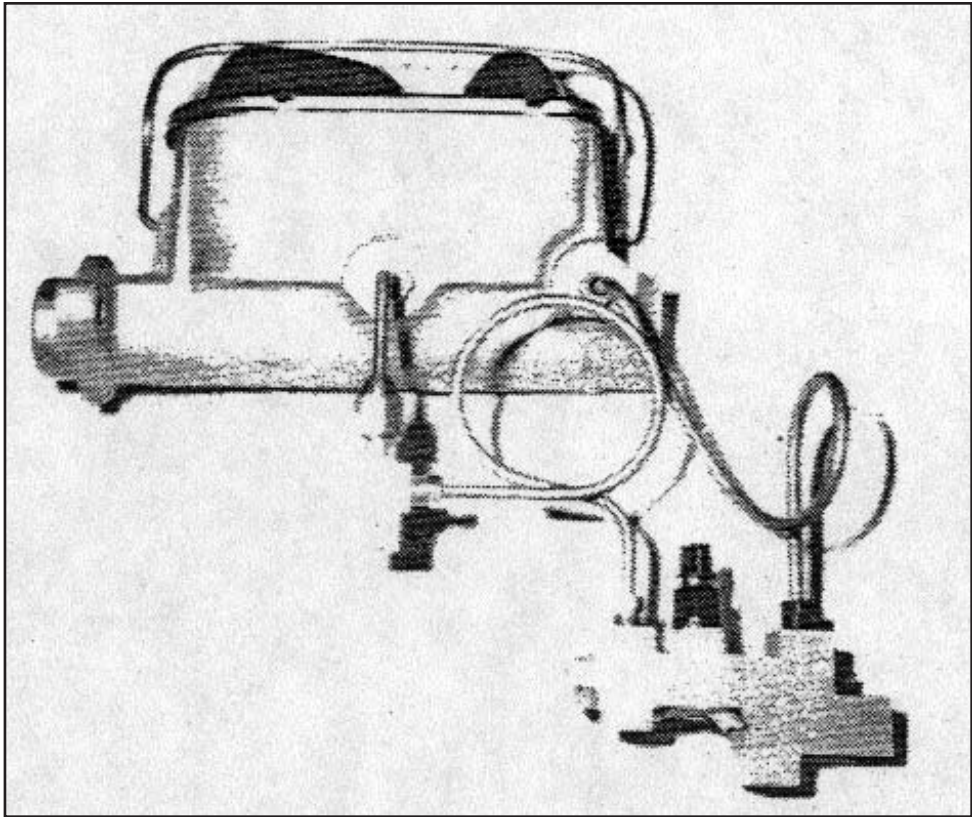


Photo #5

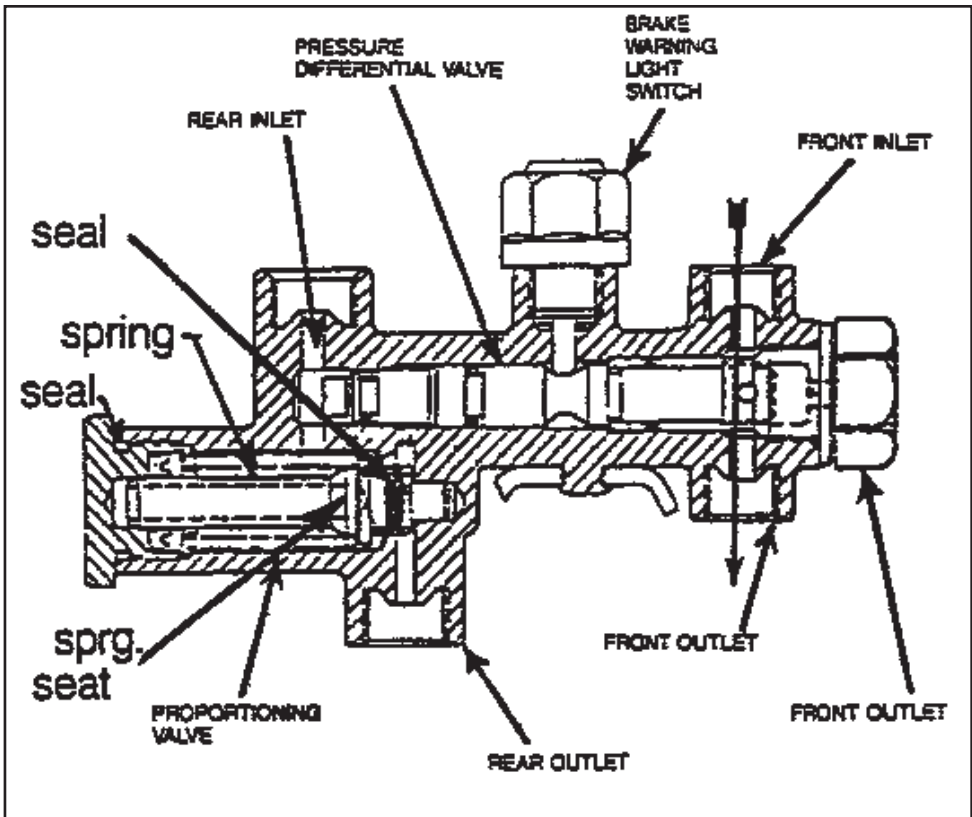


Illustration #1 - Combination Valve



# Solutions Guide

to commonly asked questions.

## Why is my brake pedal soft?

1) In most cases, Air is trapped in the lines or calipers. Try re-bleeding the system. Do not force new fluid into new brake lines. It may foam and be very difficult to bleed. **Make sure that the bleeder screws on the calipers are facing upward!**

2) If all the air is out of the system, the pushrod from the booster may need adjustment, under the dash, to make it longer. Do not extend it too long or it will not allow the fluid to return, causing brakes to drag. Your pushrod may not be adjustable. If the pushrod can be made longer, try ¼ turn adjustments at a time. In addition, the pushrod between the Booster and the Master Cylinder may need adjustment. Not all Booster to Master pushrods are adjustable.

3) You may have a bad Master Cylinder. Before you determine this, you should make sure that all the air is out of the system. When installing a new Master Cylinder, always bench bleed first. If you did not, take off the Master Cylinder and bench bleed it. (See Bench Bleeding Instructions below)

## Why does the car pull to one side?

The side that the car is pulling to is the caliper that is working. Re-bleed the opposite side and try carefully stopping again.

## Why does it feel like there is no Power Assist?

The Booster may not be getting enough vacuum to operate. On some high lift cams, the engine does not develop enough vacuum. The Booster needs at least 16" of vacuum to operate correctly at idle. If you do not have at least 16 inches of vacuum at idle, you may have to add a vacuum pump to your system.

Check for vacuum leaks. There may be leaks in the intake manifold or hoses that would cause low vacuum. The Booster may be bad. Do a vacuum test. If the Booster can retain a vacuum for three (3) minutes after the vehicle is shut off, it is not a bad Booster (refer to steps 1 & 2). All Master Cylinders must be bench bled in a vise before being installed on the vehicle.

## How do you bench bleed a Master

## Cylinder?

Secure one of the ears in a vise so that you can take a large screwdriver and push the piston in. Fill the reservoir with clean fluid. Take a dummy line or our M/C bleeding kit and hook it up to the two ports. Front line to front and rear line to rear reservoirs. Slowly stroke the master and let it return slowly. You should see many air bubbles in the fluid. Repeat this step until you do not see any more air bubbles. We recommend ten (10) slow pumping strokes after you see no more air bubbles. This will insure a good hard pedal. (See master cylinder bleeder kit instruction Sheet)

## What is the best pad for my vehicle?

Your choice of pads should be determined by how and where you drive the vehicle. If you drive in heavy stop and go traffic you would need a different pad than someone who is road racing.

## How often should brake fluid be changed? (street application only, not racing)

When brake fluid turns brown, it is time to change the fluid. The brown color indicates that the fluid has absorbed water and dirt. D.O.T. #3 & #4 fluids absorb water. Silicone brake fluid is not for track racing.

## How can I tell which reservoir is the front or rear of the Master Cylinder?

The front reservoir is usually larger than the rear. In some cases, they are the same size. As a rule, for GM cars & trucks, the rear reservoir is for the rear brakes. On Ford cars & trucks, the front reservoir is for the rear brakes. On front wheel drive vehicles, the brakes are split diagonally. Each bowl of the master cylinder services one front wheel and one rear wheel. This will be important if you are installing a distribution block, proportioning valve, or residual valve. Hint: The larger bowl will feed the disc brakes.

## **Where is the best place to install a proportioning valve?**

The best place to install a proportioning valve is after the distribution block. **Do Not install it between the Distribution Block and the Master Cylinder.** You will not be able to get a hard pedal. Anywhere after the Distribution Block and before the rear flex hose is acceptable for installation.

## **Why should the flex hoses be replaced? They look O.K. from the outside.**

Flex hoses should be replaced every time the calipers are serviced. They flex up and down, just like a shock absorber. They are also under high pressure internally. Flex hoses have a rubber liner that will collapse over time. If it does collapse, it will act as a check valve and not allow fluid to return to the Master Cylinder.

## **Will my pedal get harder by replacing the flex hoses?**

No. When the flex hoses are replaced, re-bleed the brake system. Normally what happens is that bleeding causes a harder brake pedal. A better bleeding job and taking your time will result in the same situation.

## **Are the rubber flex hoses expanding causing a soft pedal?**

Not likely. A soft pedal is usually a sign of air in the system due to poor bleeding. Flex hoses have nylon webbing that is molded into the internal rubber. It is very strong and will hold up to 3,000 P.S.I. Installing braided stainless steel hoses is not necessary; it only improves appearance.

## **How much brake pressure does it take to stop my vehicle?**

Most vehicles, power or non power brake, develop 1,200 P.S.I. When you panic stop or jump on the brakes hard, a surge of 1,400 P.S.I. can be achieved. If a factory proportioning valve installed on the vehicle, the rear brakes are only developing 600 – 700 P.S.I. Drum brakes require lower pressure because they grab more quickly. When rear disc brakes are installed, the rear brake pressure may be increased to 800 – 1,000 P.S.I. or more. A good way to check the pressures and to see if the system is working correctly, use a pressure gauge screwed into the bleeder port. A vehicle with less than 600 P.S.I. will not stop!

## **How tight should the wheel bearings be?**

The front bearings should always be torqued. Not just hand tightened. Bearings usually require 12-15 Ft./Lbs. of torque. Then you will probably need to back off a little to align the cotter pin hole. Do Not over tighten; the bearing life will be shortened. This procedure only applies to rear wheel drive vehicles with separate bearings and races. On vehicles with one piece sealed bearing assemblies or hub assemblies, refer to a service manual.

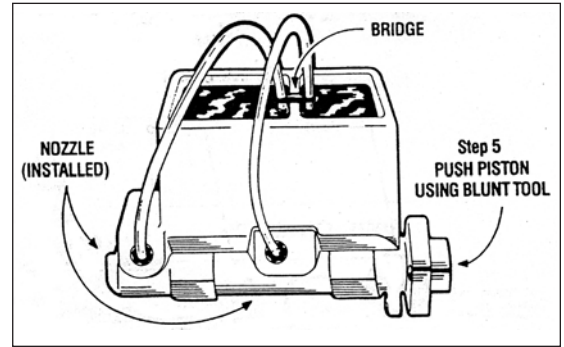
## **What type of differential fluid should I use in my rear axle?**

If you have positraction, use a Hypoid or Limited Slip additive that is designed for your particular rear end. If you do not have positraction, any type of 80 –90 weight gear lube is acceptable. Fluid should be changed often if you are trailering or any type of extreme usage. This fluid does brake down with time and usage.

# How and why do I bench bleed a master cylinder?

When installing or replacing a master cylinder, it is critical that all air is removed from the master cylinder. This can easily be done by bench bleeding the master cylinder prior to installation. Using the master cylinder bleeder kit:

- 1) Place your master cylinder in a vise by the ears (not body). Make sure it is level.
- 2) Attach a piece of clear plastic hose to the short end of one of the plastic nozzles. Do the same to the other hose and nozzle.
- 3) Clip the plastic bridge to the wall and push the ends of the hose through the holes so they are SUBMERGED in the reservoir on either side of the wall.
- 4) Press the tapered end of the nozzle FIRMLY into the cylinder port hole with a twisting motion. Repeat this procedure on the other port hole.
- 5) Fill the reservoir with CLEAN brake fluid recommended by the manufacturer.
- 6) Using full strokes, push the piston in, then release. Do this until ALL the air bubbles have disappeared from the clear plastic hose. **(CAUTION-MASTER CYLINDER WILL NOT BLEED PROPERLY UNLESS HOSES ARE SUBMERGED IN BRAKE FLUID UNTIL THE BLEEDING PROCESS IS COMPLETED.)**



Now mount master cylinder and avoid brake fluid leaking out of front and rear ports during installation.

## Bleeding steps for Dual Port Master Cylinder

If you have a master cylinder with dual port holes (4 port holes - 2 on each side), it is necessary to bleed both port sides of the master cylinder. If both sides of the master cylinder are not bled, there will be air trapped in the master cylinder and your brakes will not function properly.

To bleed dual port master cylinders:

- 1) Follow steps 1 - 6 above on the side you will be hooking the brake lines to. Plug the other side.
- 2) Once the air bubbles are no longer visible in the plastic hose, open the bleeder screws in the supplied plugs and allow the mater cylinder to gravity bleed. **DO NOT** push the master cylinder piston in while the plugs are gravity bleeding.
- 3) When clear, steady streams of fluid are coming out of both bleeders, close and tighten the bleeders. Give the master cylinder piston several strokes, making sure there are still no bubbles present in the clear plastic tubes.
- 4) Remove the tubes and plastic fittings and mount the master cylinder on the vehicle being careful not to spill brake fluid on any painted surfaces.