

## Manual Brake Conversion Kit, 1994-95 (MMBAK-13)



**IMPORTANT:** The Maximum Motorsports Manual Brake Conversion Kit is NOT intended for use with a stock, unmodified braking system. Upgrading to stainless steel brake hoses and more aggressive pads is *highly* recommended.

Thank you for purchasing the Maximum Motorsports Manual Brake Conversion Kit. The MM kit will help eliminate the problems associated with power-assisted brakes. You will find many features that set our Manual Brake Conversion Kit apart from the rest.

We include a new brake pedal arm. The MM kit only moderately increases the brake pedal effort because we improved the pedal arm geometry from that of power-assisted brakes to a better mechanical leverage ratio for non-assisted brakes.

The MM kit has a unique pedal pad assembly. The MM Brake Pedal Pad bolts to the MM Brake Pedal Arm in any one of six possible positions. This allows you to customize the brake pedal's position to suit your needs. The MM Brake Pedal Pad has two possible fore and aft positions, and three possible vertical positions. This lets you fine-tune the mechanical leverage ratio to suit your preferences. This also allows changing the position of the MM Brake Pedal Pad, relative to the throttle pedal, to aid in heel-and-toeing.

The MM kit includes a new, stronger, adjustable length pushrod that attaches to the pedal arm with a spherical rod end. This attachment method eliminates the sloppy fit of the stock pushrod, further improving the pedal feel.

The MM kit includes a new adjustable brake light switch and mounting bracket.

The MM kit includes a CNC machined aluminum adapter block that bolts to the firewall in place of the vacuum booster. This adapter is designed to mount a stock Ford master cylinder. By using readily available 1979-95 Ford master cylinders, you are assured of always being able to find one easily, whether at home or at the track.

The MM kit weighs half as much as the OE components it replaces/ eliminates, thereby reducing front-end weight and improving the front-to-rear weight balance.

### Technical Notes

The pedal effort of non-assisted brakes may seem quite high at first when compared to power-assisted brakes. If, after installation, the pedal effort and/or travel are not to your liking you have several options to tune your car's braking performance. Options for modifying braking performance include: adjusting the MM Brake Pedal Pad, installing stainless steel brake hoses, installing upgraded brake pads, changing the bore size of the master cylinder, and installing a big brake kit. Keep in mind that some adjustments/modifications will have trade-offs. See the table below for more information.

Modification	Pedal Effort	Pedal Travel
Pedal pad - move away from pivot	Decrease	Increase
Pedal pad - move towards pivot	Increase	Decrease
Stainless steel brake hoses	-	Decrease
High performance brake pads	Decrease	-
Master cylinder - smaller bore	Decrease	Increase
Master cylinder - larger bore	Increase	Decrease
Big brake kit (Brembo/StopTech)	Decrease	Varies

For most applications we recommend the 1994-95 Cobra master cylinder, with its 15/16" bore. Other Ford master cylinders (from 1979-1995) can be used if a different bore size is desired.

NOTE: The brake hard lines under the hood will need to be rerouted, as the brake master cylinder will be positioned about 6.5" closer to the firewall after installing this kit. MM offers brake line adapter kits to help complete the installation. When using the 1994-95 Cobra master cylinder on non-Cobra vehicles the MMBAK-7.1 Brake Line Adapter Kit is required. See the table on the following page to assist you in choosing the correct brake line adapter kit for your application.

Car Model	Master Cylinder Bore	OE Application	Brake Line Adapter Kit
1994-95	15/16"	1994-95 Cobra	MMBAK-7.1
GT or Cobra	1"	1993 Cobra	MMBAK-5.1
	1-1/16"	1994-95 GT	MMBAK-5.1

Contact a MM sales representative to discuss your specific application needs.

#### Required Tools

- Ratchet
- Assorted Sockets (Metric and Standard)
- Long (wobble) Extension
- Torque Wrench
- Drill and 5/16" Drill Bit
- Assorted Wrenches
- 12mm Flare Nut Wrench
- Hook Tool or Pliers

*Read all instructions before beginning work. Following instructions in the proper sequence will ensure the best and easiest installation.*

#### Preparation

1. Disconnect the negative terminal of the car's battery.

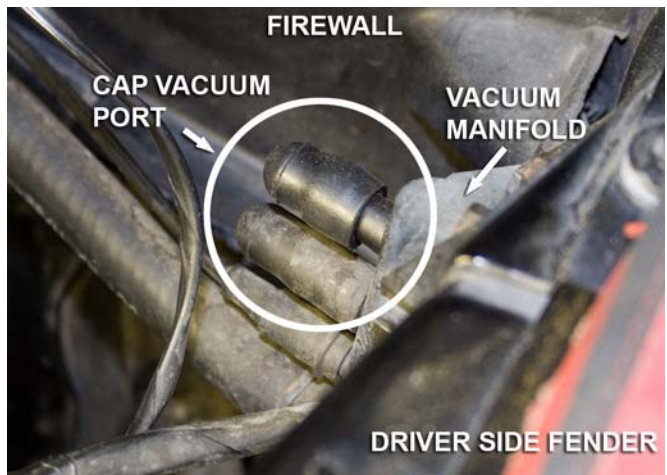
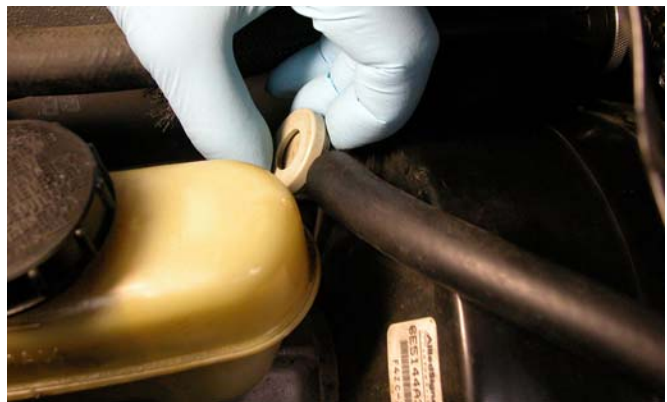
NOTE: For ease of product installation, we highly recommend removing the driver seat. The front of the seat is secured by two (2) nuts and the rear is bolted to the floor pan with two (2) bolts. Do not place any weight on the seat once it is out of the car, because the seat rails could be damaged.

NOTE: The two front seat studs can be backed out of the floor by double nutting them.

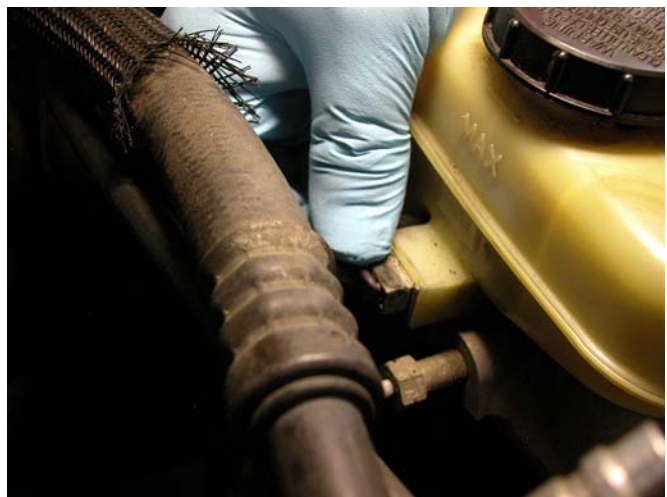
2. Measure the height from the firewall to the center of the stock pedal pad and record for future reference.



3. Disconnect the brake booster vacuum line from the vacuum manifold and seal the open port with the provided rubber cap.

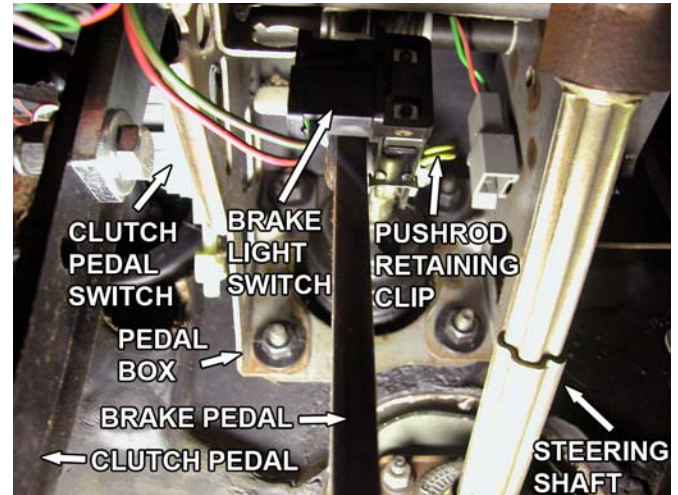


4. With the engine off, apply the brake pedal several times to deplete any vacuum left in the brake booster.
5. Remove the master cylinder from the car by disconnecting: the brake hard lines using a flare nut wrench, fluid level sensor, and two (2) bolts connecting the master cylinder to the brake booster. Take note of which port each brake hard line attaches to, for reinstallation in Step 39.





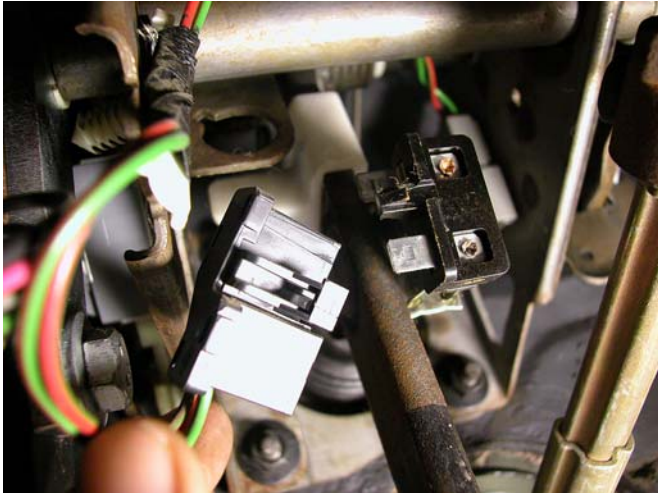
7. Remove the retaining clip from the stock brake pedal arm pushrod mounting stud with a hook tool or pliers.



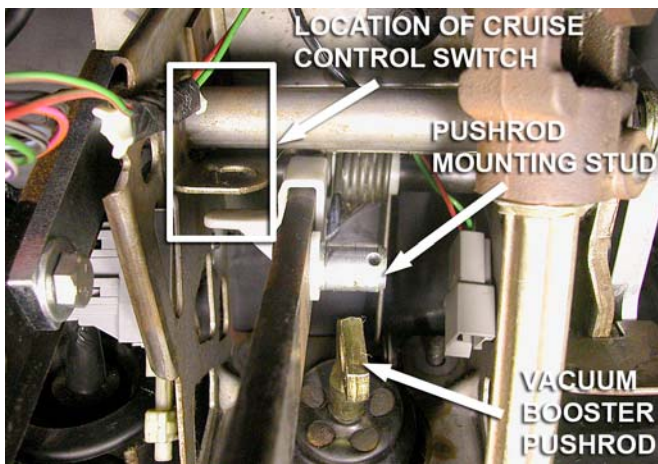
6. Cover any exposed brake lines or ports to avoid getting contaminants in the brake system.

NOTE: Clean up any spilled brake fluid as soon as possible to prevent damage caused by the fluid.

- Disconnect the brake light switch electrical connections, and remove it from the pushrod mounting stud on the brake pedal arm.

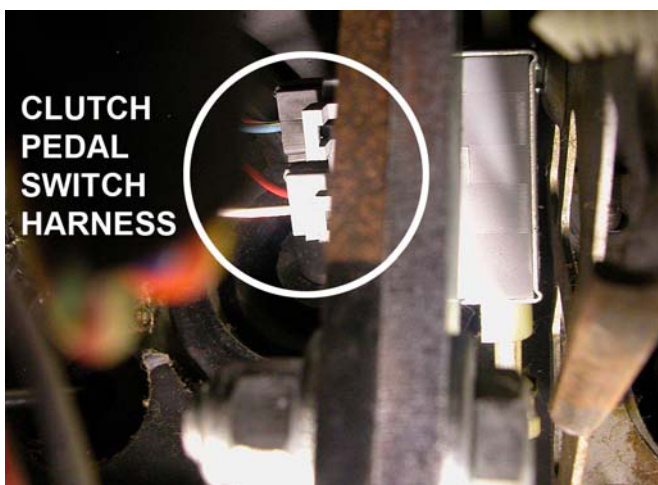


- Disconnect the vacuum booster pushrod from the stock brake pedal.



- If your car is equipped with cruise control, remove the vacuum hose from the cruise control vacuum switch. The vacuum switch is located to the left of the pedal arm (see above photo).

- Disconnect the clutch pedal position switch.

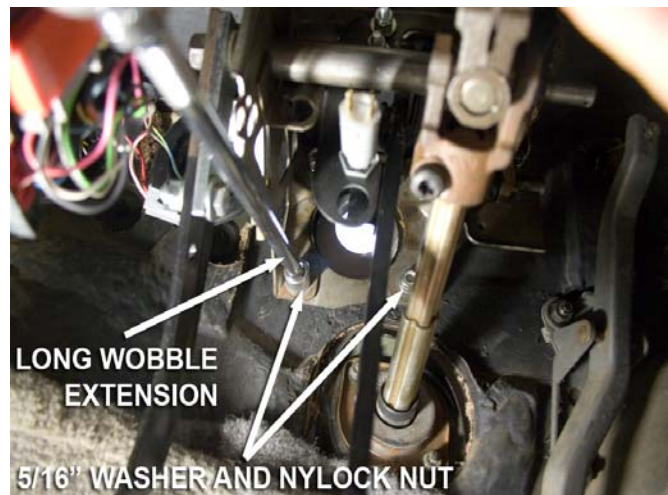


- Disconnect the clutch cable from the clutch quadrant.

NOTE: The OE clutch quadrant is spring loaded; use caution when disconnecting the cable.

NOTE: If a firewall adjuster is present, turn it clockwise until the tension is removed from the clutch cable. If an adjustable cable is present, remove the clutch fork cover from the transmission and loosen the jam nuts on the backside of the clutch fork until the tension is removed from the cable.

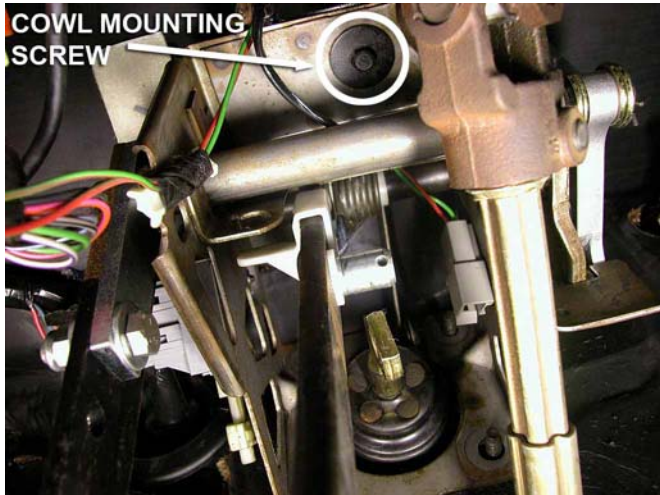
- Disconnect any electrical harnesses attached to the pedal box.
- Remove the four (4) nuts from the brake booster studs protruding through the firewall, which secure the pedal box to the firewall. This will remove the primary support holding up the brake booster; be careful that it does not fall under its own weight. *Tech Tip:* Due to limited access, it can be helpful to use a socket with a long wobble extension.



- Remove the brake booster from the car by rotating it towards the engine (counterclockwise) and pulling up and out. You may need to remove the clutch cable to create enough room to pull the booster out.



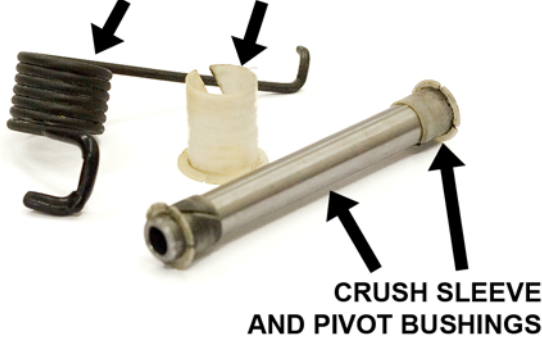
16. Remove the upper mounting screw securing the pedal box to the cowl. Support the pedal box, as it may fall once the screw is removed.



17. Remove the pedal box by rotating counterclockwise about the steering column. Be careful not to snag any electrical components as you remove the pedal box.

18. Place the pedal box on a workbench and remove the OE brake pedal from the pedal box. Save the pivot bolt and nut, crush sleeve, pivot bushings, torsion spring, and torsion spring bushing, as you will need to reuse these items with the MM Brake Pedal Arm.

**TORSION SPRING AND BUSHING**



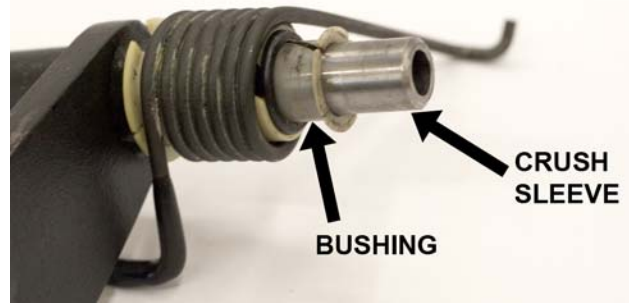
**CRUSH SLEEVE AND PIVOT BUSHINGS**

Brake Pedal Arm Installation

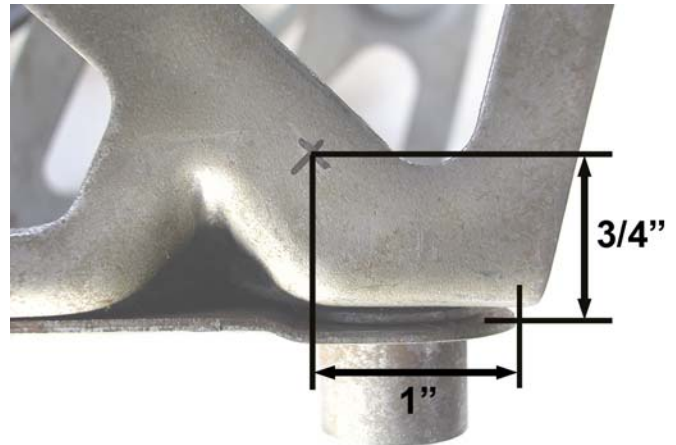
19. Transfer the OE crush sleeve and pivot bushings into the pivot tube of the MM Brake Pedal Arm.

20. Place the torsion spring bushing on the short end of the MM Brake Pedal Arm pivot tube, with the flange against the MM Brake Pedal Arm. Place the torsion spring on the bushing, with the short leg supporting the bottom of the MM Brake Pedal Arm.

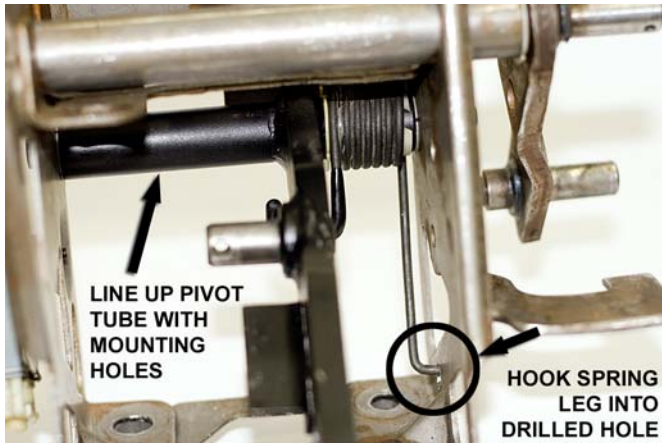
**INSTALL CRUSH SLEEVE AND PIVOT BUSHING IN MM BRAKE PEDAL ARM**



21. The pedal box requires a slight modification to relocate the OE torsion spring mounting hole from the tab in the middle of the pedal box to the passenger side face of the pedal box. To do so, drill a 5/16" hole in the passenger side face of the pedal box 1" down from the top of the firewall plate and 3/4" above it. When viewing the pedal box from the passenger side, the newly drilled hole should be on the same axis as the original OE spring mounting hole.



22. Install the MM Brake Pedal Arm in the pedal box by first hooking the long leg of the torsion spring in the hole drilled in the previous step. Line up the original pivot mounting holes with the MM Brake Pedal Arm pivot tube, and slide the OE pivot bolt through and secure with the OE nut.

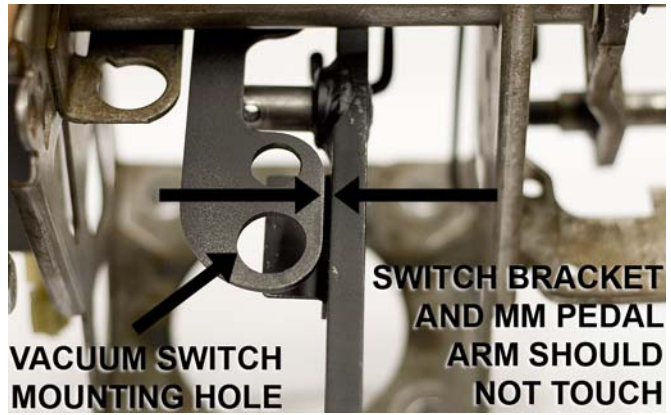


23. Torque the pivot bolt to **19 ft-lbs.**

Switch Bracket Installation

24. Install the MM Switch Bracket onto the pedal box. Position the MM Switch Bracket so that the two 3/8" holes are above the oval holes in the pedal box cross member. Bolt the MM Switch Bracket to the cross member. Place a 1/4" G8 washer on each of the two (2) supplied 1/4-20 x 7/8" G5 hex bolts. Insert the bolts into the holes in the MM Switch Bracket and the pedal box crossmember. Secure each bolt with a 1/4" G8 washer and a 1/4" G5 Nylock nut. Do not tighten the nuts completely just yet.

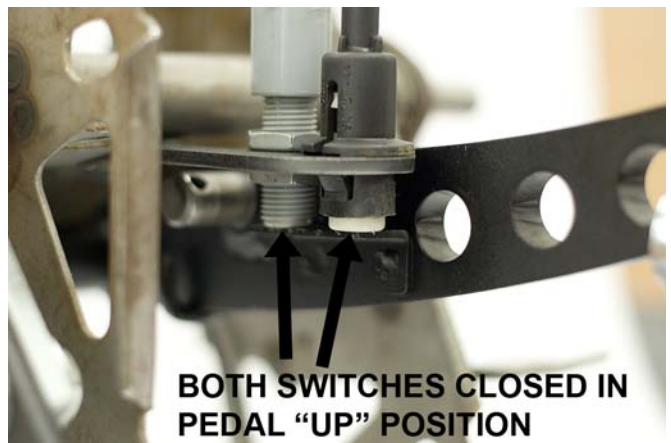
**MOUNT SWITCH BRACKET TO THESE HOLES IN THE CROSS MEMBER**



25. Install the brake light switch and the cruise control vacuum switch (if applicable) in their respective holes in the MM Switch Bracket (larger hole is for the vacuum switch).



26. Position the MM Switch Bracket so that the brake light switch and cruise control vacuum switch are both touching the stop on the MM Brake Pedal Arm. The cruise control vacuum switch should be fully depressed when the brake pedal is not in use. The MM Switch Bracket should not touch the MM Brake Pedal Arm. Test fit the MM Brake Pushrod Assembly to ensure that the spherical rod end is not in contact with the MM Switch Bracket. Do not worry about fine tuning the height of the brake light switch, as it will be done in Step 46.



- Once the MM Switch Bracket is properly positioned, torque the 1/4" mounting bolts to **10 ft-lbs**.

### Firewall Adapter Block Mounting

- Re-install the pedal box under the dash in its original position, using the upper cowl mounting screw to hold the assembly in place. Snug the upper mounting screw, but do not fully torque it yet, in case the pedal box position needs to be adjusted in the next step.



- Mount the MM Master Cylinder Adapter Block onto the firewall with the long leg pointing down and the four (4) studs pointing towards the firewall. Insert the studs through the holes originally used to mount the brake booster. The studs should pass through the mounting holes in the pedal box on the interior side of the firewall.

NOTE: For additional protection from water leakage, apply automotive grade silicone to the firewall side of the MM Master Cylinder Adapter Block before installing. Keep in mind, that this will make the block harder to remove in the future.

NOTE: The MM Master Cylinder Adapter Block studs will only fit when it is oriented properly. If it doesn't fit on the first attempt, rotate the MM Master Cylinder Adapter Block in 90° increments until the studs pass through the firewall.



NOTE: The color of the MM Master Cylinder Adapter Block shown in these instructions is only for clarity. Actual color will vary.

- Place a 5/16" AN washer over each stud on the interior side of the firewall.
- Place a 5/16" Nylock nut on each stud and torque to **19 ft-lbs**.



- Torque the upper cowl mounting bolt to **18 ft-lbs**.

### Master Cylinder Installation

- Fully thread the MM Brake Pushrod onto the 1/2" spherical rod end as a preliminary starting point for the final adjustment in Step 40.



- Slide the spherical rod end of the MM Brake Pushrod Assembly over the mounting stud on the MM Brake Pedal Arm while making sure that the other end passes through the firewall and MM Master Cylinder Adapter Block.
- Push the supplied hairpin clip into the hole exposed on the end of the mounting stud. Make sure you push it on far enough that it snaps securely over the mounting stud.
- Mount the master cylinder onto the MM Master Cylinder Adapter Block. Guide the MM Brake Pushrod Assembly into the receiver cup of the master cylinder as you slide the master cylinder onto the MM Master Cylinder Adapter Block.

NOTE: When installing a new master cylinder it is important to bench-bleed the master cylinder first. Consult the factory shop manual for the proper procedure.



37. Place a 3/8" AN washer over each of the master cylinder mounting studs.
38. Place a 3/8" Nylock nut on each stud and torque to **33 ft-lbs.**
39. Install brake hard lines from the master cylinder to the OE proportioning valve. Be sure to connect the front port of the master cylinder to the front port of the proportioning valve and the rear port of the master cylinder to the rear port of the proportioning valve. Recall Step 5 for reference.
40. Place one hand on the pushrod where it meets the master cylinder. With the other hand, move the brake pedal slightly downward. Adjust the pushrod length until there is the minimum free play possible in the pushrod. If the pushrod moves the m/c the instant you move the pedal, there is no free play in the pushrod and it needs to be shortened. Shorten the pushrod in 1/2 turn increments until there is a minimum amount of free play.

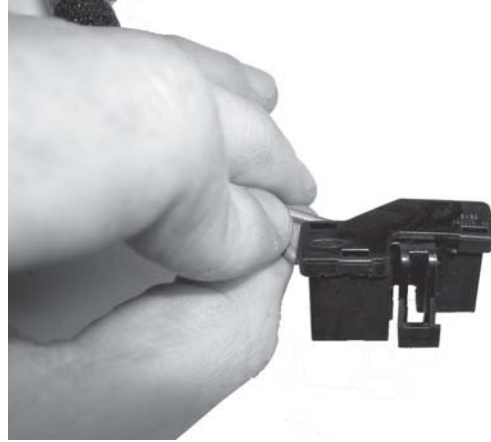
NOTE: If the pushrod is too short and does not contact the master cylinder, a slight rattle will occur each time the pedal is depressed. If the pushrod is too long, the brakes may begin to drag or not release while driving.

NOTE: The at-rest height of the MM Pedal Arm is fixed and cannot be adjusted. It is held in position by the OE torsion spring installed in Step 21 and NOT by the MM Brake Pushrod Assembly. Any adjustments in pedal pad location should be made using the various mounting holes on the MM Brake Pedal Pad.

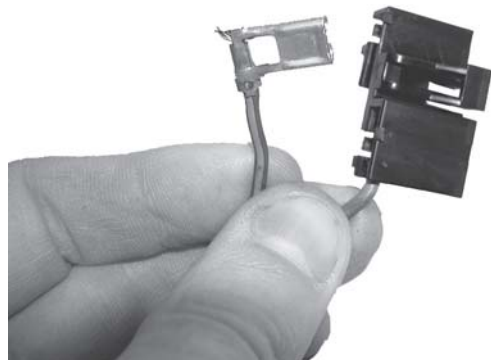
41. Snug the 1/2" jam nut on the spherical rod end against the MM Brake Pushrod Assembly to prevent the length from changing.

### Connecting the Brake Light Switch

42. The OE brake light switch electrical connector must be modified to work with the provided brake light switch. Remove the top of the electrical connector to expose the individual wires.



43. Remove the wires by depressing the small tab that holds each wire inside the connector.



44. Connect the brake light switch wires directly to the contacts on the back of the provided brake light switch (polarity does not matter).



45. Reconnect the negative battery terminal.
46. Adjust the brake light switch position so that the amount of pedal travel to activate the brake lights is no more than one inch. After you adjust the switch to your liking, tighten the sheet metal nuts on the switch housing so the switch will not move. If the car has cruise control, you will need to orient the top mounting nut on the brake light switch to provide adequate space for the cruise control vacuum switch.

NOTE: Have a friend stand behind the vehicle to indicate when the brake lights are activated as the pedal is depressed.

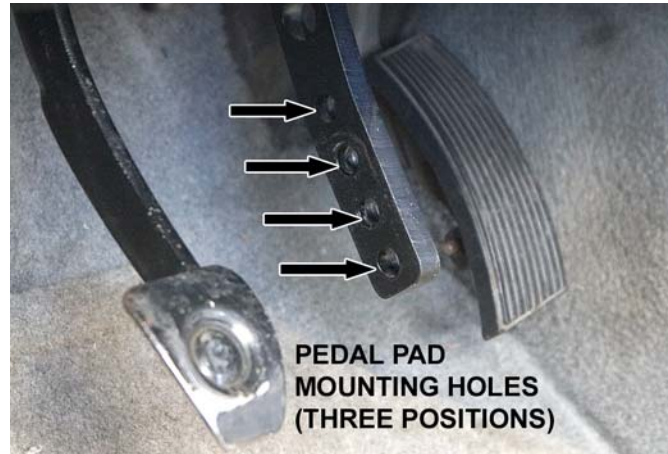
#### Remaining OE Components

47. Re-install/connect the remaining components under the dash that were disconnected/removed during the pedal box removal; clutch cable, clutch pedal position switch, and cruise control vacuum switch (if applicable).

#### Brake Pedal Pad Mounting

The MM Brake Pedal Pad's vertical height on the MM Brake Pedal Arm can be adjusted, which in turn changes the pedal ratio. We recommend starting with the MM Brake Pedal Pad mounted in the middle pair of holes on the MM Brake Pedal Arm. If, after road testing the car, you find the pedal effort and pedal travel not to your liking, the pedal ratio can be adjusted by mounting the MM Brake Pedal Pad in one of the other sets of holes on the MM Brake Pedal Arm. Mounting the MM Brake Pedal Pad in the upper-most pair of holes results in a MM Brake Pedal Arm length that is approximately 3/4" shorter; this means you will have less pedal travel and a higher pedal effort. Using the lowest pair of holes results in a MM Brake Pedal Arm length that is approximately 3/4" longer; this means you will have more pedal travel and a lower pedal effort.

48. Place a 3/8" AN washer over each of the two (2) supplied 3/8-16 x 1-1/4" bolts.
49. Position the MM Brake Pedal Pad at the desired location on the MM Brake Pedal Arm and slide the two (2) 3/8" bolts through the appropriate mounting holes.



50. Place a 3/8" AN washer over each bolt.
51. Thread a 3/8" Nylock nut onto each bolt and tighten until they are snug. The nuts will be torqued properly in Step 53.



## Driver Adjustments

The OE brake pedal placement is considered by many drivers to be too "high" relative to the gas pedal. This makes heel/toe downshifting difficult. The adjustability of the MM Brake Pedal Pad allows it to be moved closer to the elevation of the gas pedal. The MM Brake Pedal Pad "height" can be adjusted by switching between the two sets of mounting holes on the MM Brake Pedal Pad.

52. Have the driver sit in the driver's seat and determine if the MM Brake Pedal Pad position is suitable. Adjust the MM Brake Pedal Pad height as necessary.

NOTE: It may be helpful to use the measurement made in Step 2 to set the initial position of the pedal before placing the driver in the vehicle.

53. Torque the 3/8" bolts fastening the MM Brake Pedal Pad to the MM Brake Pedal Arm to **33 ft-lbs**.



## Finishing the Installation

54. Bleed the brake system per the factory shop manual. Verify that there are no leaks coming from the fittings at the master cylinder.
55. Carefully test-drive the car. The pedal effort of non-assisted brakes may seem quite high at first when compared to power-assisted brakes. After driving the car it will become apparent that while the pedal effort is higher than with power-assisted brakes, the effort is not unduly high. If, after test-driving, you wish to change the pedal effort and pedal travel, refer to the *Brake Pedal Pad Mounting* section. For additional adjustment to the braking system, refer to the *Technical Notes* section at the beginning of these instructions.

### This kit includes:

- 1 Master Cylinder Adapter Block
- 1 Brake Pedal Arm
- 1 Brake Pedal Pad
- 1 Brake Pushrod Assembly
- 1 Brake Light Switch Bracket
- 1 Brake Light Switch
- 4 5/16 - 18 G5 Nylock Nut
- 4 5/16 SAE G8 Washer
- 2 3/8-16 x 1-1/4" Bolt
- 6 3/8 AN Washer
- 4 3/8 - 16 Nylock Nut
- 2 1/4"-20 x 7/8" G5 Bolt
- 4 1/4 SAE G8 Washer
- 2 1/4 - 20 Nylock Nut
- 1 Vacuum Cap
- 1 Hairpin Clip