

TR6 DUAL MASTER CYLINDER INSTALLATION INSTRUCTIONS

Braking needs vary from one vehicle to another due to tire size, suspension settings, weight and other factors. Good Parts makes no recommendation as to the suitability of a particular component combination for your specific vehicle.

WARNING: Optimum braking is achieved with the correct balance of front to rear bias. Too much braking power in the front reduces overall braking because the rear is contributing less. Too much rear braking is very dangerous because rear wheel lock-up can cause the car to spin out of control.

TEST YOUR BRAKES in a safe place where there is no danger to (or from) other people or vehicles **BEFORE** driving on the street.

- 1) Remove the clevis pin from the brake pedal and the original master cylinder, booster and aluminum spacer from the firewall.
- 2) Remove the brake lines from the master cylinder to the pressure differential switch.
- 3) Apply the foam tape to the surface of the firewall in a complete circle around the actuating rod hole and inside of the four bolt holes as a seal.
- 4) Bolt the new master cylinder assembly in place using the new bolts, flat washers and nylon stop nuts supplied.
- 5) Adjust the length of the actuating rod to achieve the desired pedal height but maintain at least $\frac{3}{8}$ " thread engagement into the clevis and the rod end. The clevis end is already threaded in $\frac{3}{8}$ " and the jam nut is tightened so you should be able to leave that end alone and make your adjustment at the rod end.
- 6) Install the new clevis pin through the clevis and brake pedal and install and bend open the new split pin.
- 7) Tighten the jam nut on the actuating rod with the rod end in the center of its swivel range.
- 8) Install your choice of large or small reservoirs onto the master cylinders. Note Wilwood's recommendation to warm the neck of the reservoir with a hair dryer before installing to avoid cracking. Check that the master cylinder reservoir cap will clear the bonnet **BEFORE** dropping the bonnet. On our test vehicle there was about $\frac{3}{8}$ " clearance with the large reservoirs but cars may vary a little. The master cylinders came with hose and fittings for remote mounting the reservoirs so those parts are included.
- 9) Install the brake lines from the master cylinders to the pressure differential switch. The master cylinder toward the engine is for the front brakes and connects to the front fitting on the pressure differential switch using the line with the larger threaded fitting.

10) Fill the reservoirs with high temperature DOT 3, 4 or 5.1 brake fluid. DOT 5 fluid is not recommended for any racing application due to the possibility of boiling of collected moisture in the system. Also, DOT 5 fluid is highly compressible due to aeration and foaming under normal braking conditions, providing a spongy brake feel. DOT 5 fluid is best suited for a show car where its anti-corrosion and paint friendly characteristics are important.

11) Follow Wilwood's instructions for bleeding. If the system was not opened below the pressure differential switch, most of the air can be removed by bleeding at the master cylinder and at the connections to the differential switch. It may be necessary to bleed at the wheels also.

LEVERAGE ADJUSTMENT

The three holes in the lever allow adjustment of mechanical advantage to change the required pedal pressure. If the rod end is bolted in the lowest hole more pedal pressure will be required. If the highest hole is used less pedal pressure will be required to do the same amount of braking. To change the position of the rod end, remove the jam nut from the end of the bolt then thread the bolt out of the lever. Move the rod end to the desired hole, thread the bolt back in with the head away from the engine and torque to 10 ft/lb. Thread on the jam nut and torque to 15 ft/lb.

BIAS ADJUSTMENT

Front to rear bias adjustment is done by turning the 3/8-24 threaded rod that goes through the main lever and the two master cylinder clevises. There is a ball and socket affixed to the center of the rod that serves to transfer the force from the main lever to the rod. To adjust bias loosen the lock nuts on the threaded rod and turn the threaded rod. The rod is threaded through both master cylinder clevises so as it is turned, the ball in the center of the rod moves closer to one master cylinder clevis and further away from the other. The master cylinder that it is closer to gets more mechanical force. Since we have connected the master cylinder closest to the engine to the front brakes, moving the rod toward the engine by turning counter clockwise when looking at the engine end will increase the front braking and reduce the rear braking. Tighten the lock nuts after adjusting. Two lock nuts are supplied. One is sufficient but two may be used. Using two will limit the swivel of the yokes and balance rod assembly so make sure it is level when you tighten the second lock nut.

Do not be alarmed if the balance bar becomes "cocked" when pressure is applied. This is normal and has no effect on bias. One system, front or rear, may require movement of more fluid before building up pressure than the other. Even the manual adjustment of rear drum brakes will effect the cocking of the balance bar. The important thing is that the balance bar is not allowed to cock so far that it binds. After the systems are fully bled and properly adjusted, if the balance bar is cocked too far under full braking, you may induce some initial cocking of the balance bar in the opposite direction. You can do this by threading one master cylinder push rod further into its clevis and the other one out the same amount. Do not thread a push rod completely in against as this will cause binding. If they are already threaded in far as possible you can just thread the one out without threading the other one in but then you may have to adjust the length of the main push rod to correct pedal height. More details on this are in Wilwood's instructions copied here on page 3.

WARNING • DO NOT DRIVE ON UNTESTED BRAKES
BRAKES MUST BE TESTED AFTER INSTALLATION OR MAINTENANCE
MINIMUM TEST PROCEDURE

- Make sure pedal is firm: Hold firm pressure on pedal for several minutes, it should remain in position without sinking. If pedal sinks toward floor, check system for fluid leaks. **DO NOT** drive vehicle if pedal does not stay firm or can be pushed to the floor with normal pressure.
- At very low speed (2-5 mph) apply brakes hard several times while turning steering from full left to full right, repeat several times. Remove the wheels and check that components are not touching, rubbing, or leaking.
- Carefully examine all brake components, brake lines, and fittings for leaks and interference.
- Make sure there is no interference with wheels or suspension components.
- Drive vehicle at low speed (15-20 mph) making moderate and hard stops. Brakes should feel normal and positive. Again check for leaks and interference.
- Always test vehicle in a safe place where there is no danger to (or from) other people or vehicles.
- Always wear seat belts and make use of all safety equipment.

BALANCE BAR ADJUSTMENT

The balance bar is an adjustable lever (usually a threaded rod), that pivots on a spherical bearing and uses two separate master cylinders for the front and rear brakes. Most balance bars are part of a pedal assembly that also provides a mounting for the master cylinders. When the balance bar is centered, it pushes equally on both master cylinders creating equal pressure, given that the master cylinders are the same size bore. When adjusted as far as possible toward one master cylinder it will push approximately twice as hard on that cylinder as the other, Figure 2.

Thread the master cylinder pushrods through their respective clevises to obtain the desired position. Threading one pushrod into its respective clevis means threading the other one out the same amount. Sometimes this will lead to a "cocked" balance bar when the pedal is in the relaxed position, see Figure 2, "no pedal effort". This is perfectly acceptable as long as each master cylinder pushrod is completely free of pressure when the pedal is relaxed.

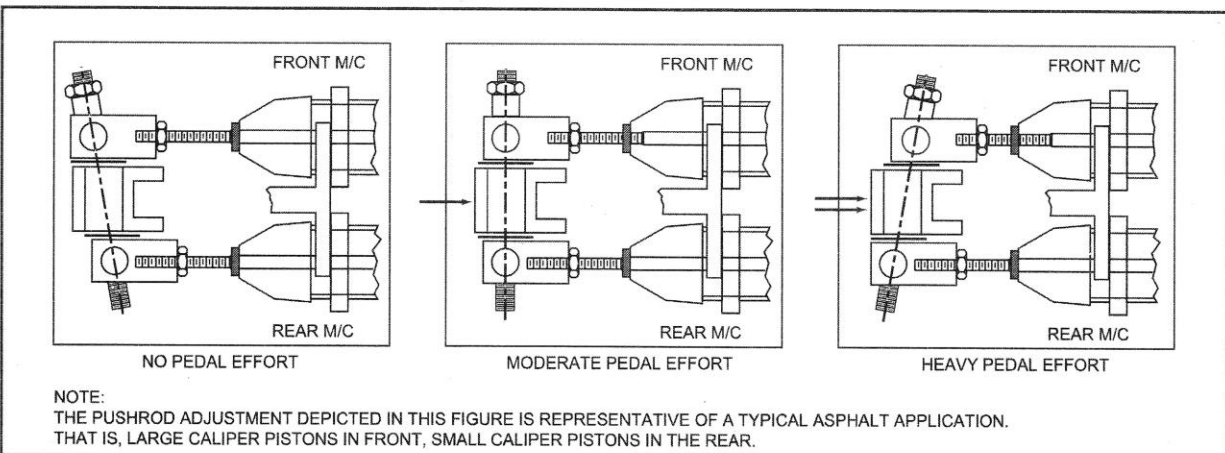


Figure 2. Balance bar lever adjustment

Notes:

To obtain maximum performance from your brake system you should utilize Wilwoods quick check gauge, P/N 260-0966. This gauge allows for quick brake line pressure checks from 0 - 1,500 psi for assisting brake bias set-up.

A flexible hose or cable connecting the balance bar (threaded rod) to an accessible knob or crank (similar to a drill auger) is a popular way of adjusting brake bias to accommodate changes in track conditions and vehicle handling.

It is important that the operation of the balance bar functions without interference by over adjustment. This can occur when a clevis jams against the side of the pedal or the lever (bolt) hits the pedal bore during any point of pedal travel, Figure 3.

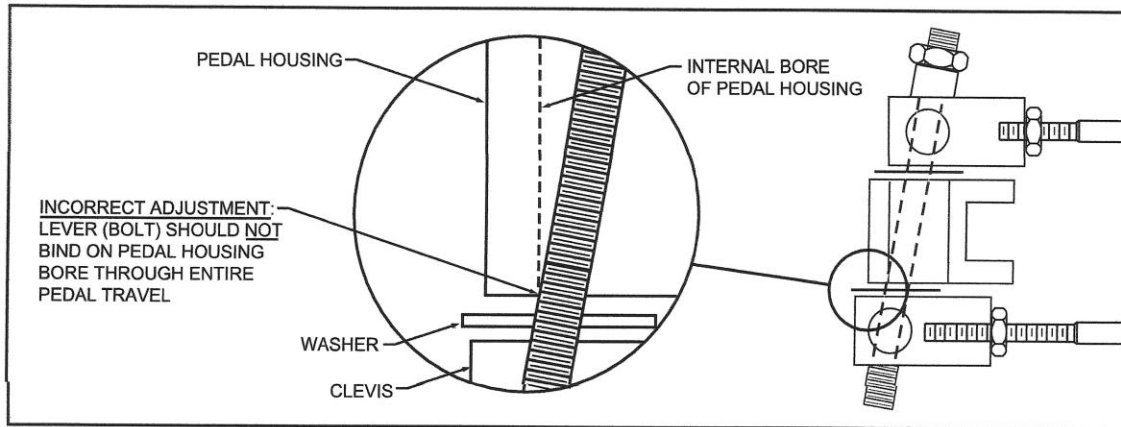


Figure 3. Balance bar lever interference

Lever movement should be unimpeded throughout pedal travel. In the neutral position, clevis's should have between .20" - .25" total clearance between the side of the pedal. The large washers between the pedal and clevis should remain loose. Make sure that the master cylinder pushrods remain true in relationship to the cylinder during entire pedal travel; pushrods should not be pushing master cylinder pistons at an angle. See Figure 4. NOTE: In its non-depressed position, the pedal and balance bar should allow the pushrod of the master cylinders to fully return. This can be checked by feeling pushrods for very *slight* movement, not loose movement. Master cylinder pistons should be against the retaining snap ring (under boot).

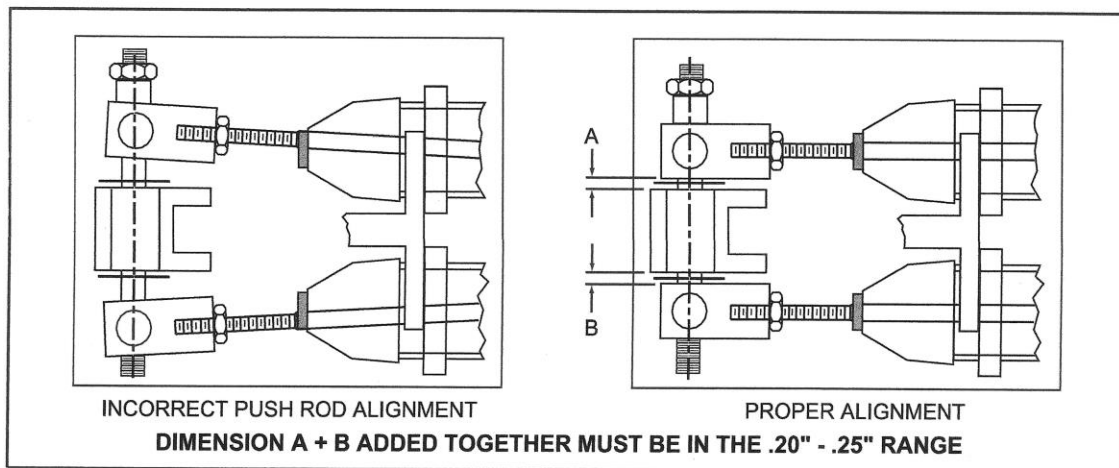


Figure 4. Example of pushrod alignment

Brake balancing can also be affected by changes made in the following:

1. Master cylinder size.
2. Caliper piston size.
3. Use of a proportioning valve.

A full understanding of the entire brake system is important to maximize brake system performance. Use of a balance bar pedal assembly can enhance a brake system with the proper installation and adjustment.

Should you have further questions, consult your authorized Wilwood dealer, or Wilwood Engineering.

REMOTE BIAS CONTROL

If you are installing the optional remote bias control, you will remove the lock nuts and connect the cable to the threaded rod on the engine side. Turning the control knob clockwise will increase rear braking so choose the correct decal for the knob to indicate this. Mounting location for the control knob and routing of the cable is optional. The cable may be cut to length. It is recommended to braze the end to avoid fraying.

PARTS LIST

- | | |
|--|--|
| 1 - Instructions | 4 - Washer, $\frac{5}{16}$ " USS Flat |
| 1 - Dual master cylinder assembly | 4 - Nut, Nylon Locking, $\frac{5}{16}$ - 24, Grade 8 |
| 1 - Front brake line | 1 - 10" length foam weather strip |
| 1 - Rear brake line | 2 - Reservoir kit |
| 4 - Bolt, Hex Head, $\frac{5}{16}$ - 24 x 1" Grade 8 | |



Good Parts Inc.
Richard Good
4316 New Holland Rd.
Mohnton, PA 19540
(610)777-4457
goodparts@verizon.net