

**GENERAL INSTALLATION, ASSEMBLY, AND
ADJUSTMENT INSTRUCTIONS**

FOR

**HIGH LEVERAGE 60 DEGREE MASTER CYLINDER
BALANCE BAR MOUNT**

PART NUMBER GROUP

340-4630

**DISC BRAKES SHOULD ONLY BE INSTALLED BY SOMEONE
EXPERIENCED AND COMPETENT IN THE INSTALLATION AND
MAINTENANCE OF DISC BRAKES
READ ALL WARNINGS**

WARNING

IT IS THE RESPONSIBILITY OF THE PERSON INSTALLING ANY BRAKE COMPONENT OR KIT TO DETERMINE THE SUITABILITY OF THE COMPONENT OR KIT FOR THAT PARTICULAR APPLICATION. IF YOU ARE NOT SURE HOW TO SAFELY USE THIS BRAKE COMPONENT OR KIT, YOU SHOULD NOT INSTALL OR USE IT. DO NOT ASSUME ANYTHING. IMPROPERLY INSTALLED OR MAINTAINED BRAKES ARE DANGEROUS. IF YOU ARE NOT SURE, GET HELP OR RETURN THE PRODUCT. YOU MAY OBTAIN ADDITIONAL INFORMATION AND TECHNICAL SUPPORT BY CALLING WILWOOD AT (805) 388-1188, OR VISIT OUR WEB SITE AT WWW.WILWOOD.COM. USE OF WILWOOD TECHNICAL SUPPORT DOES NOT GUARANTEE PROPER INSTALLATION. **YOU**, OR THE PERSON WHO DOES THE INSTALLATION MUST KNOW HOW TO PROPERLY USE THIS PRODUCT. IT IS NOT POSSIBLE OVER THE PHONE TO UNDERSTAND OR FORESEE ALL THE ISSUES THAT MIGHT ARISE IN YOUR INSTALLATION.

RACING EQUIPMENT AND BRAKES MUST BE MAINTAINED AND SHOULD BE CHECKED REGULARLY FOR FATIGUE, DAMAGE, AND WEAR.



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WARNING

**DO NOT OPERATE ANY VEHICLE ON UNTESTED BRAKES!
SEE MINIMUM TEST PROCEDURE WITHIN**

ALWAYS UTILIZE SAFETY RESTRAINT SYSTEMS AND ALL OTHER AVAILABLE SAFETY EQUIPMENT WHILE OPERATING THE VEHICLE

IMPORTANT • READ THE DISCLAIMER OF WARRANTY INCLUDED IN THE KIT

NOTE: Some cleaners may stain or remove the finish on brake system components. Test the cleaner on a hidden portion of the component before general use.

Photographic Tip

We suggest you take digital photos of the brake system setup before and during the disassembly procedure. This will aid in the event that something is not compatible with the new brake components and be a valuable tool to assist in the trouble-shooting process.

General Information

This master cylinder mount with balance bar assembly is ideal for DIRT Modifieds, Champ Cars, Sprint Cars, Midgets, and all applications where master cylinders must be mounted in a remote location. The assembly mounts two remote reservoir feed master cylinders on a 60 degree mounting angle to accommodate tight fit applications and easy accessibility.

The strong, but lightweight aluminum housing and balance bar assembly weighs only 1.8 pounds. It is typically mounted to the driver's left side with direct access to the adjusting knob for convenient on-track tuning of the brake bias. For other installations out of the driver's reach, the unit can also be used in conjunction with a remote bias adjuster cable.

In comparison to previous models, this unit features a redesigned pivot arm that provides smoother initial engagement and increased leverage for the driver. A positive stop detent prevents shocks and vibrations from changing the adjustment to the bar setting during competition.

Master Cylinder Orientation and Balance Bar Exploded Diagram

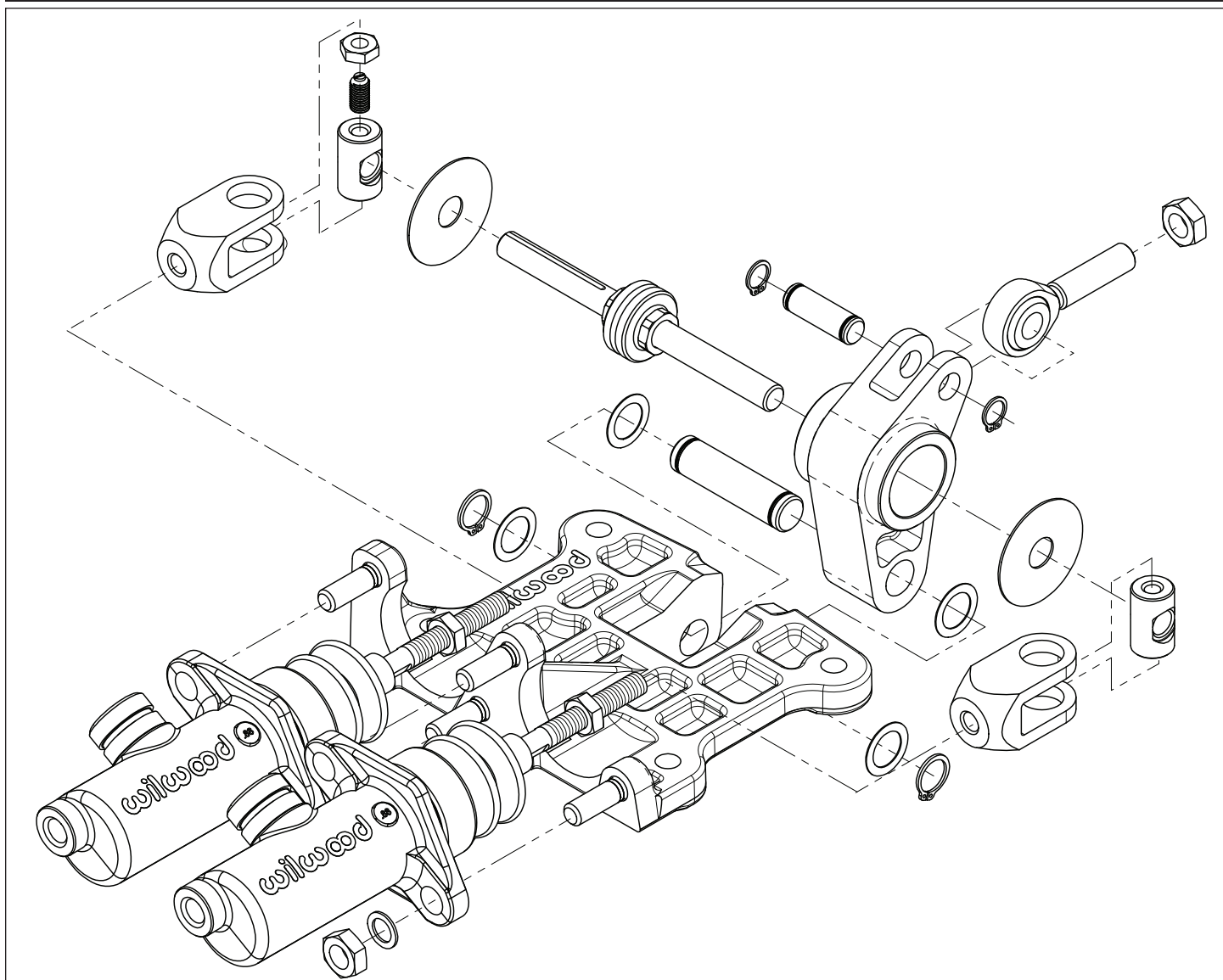


Figure 1. Typical Balance Bar / Master Cylinder Setup

General Installation, Assembly, and Adjustment Instructions

- Prior to installing the mount in the race car, or attaching the master cylinders, adjust the clevis to pivot side clearance as shown in Figure 2. The combined total clearance of A + B should be approximately 3/16". This is the equivalent of tightening the clevises to remove all play, and then backing them off 4-5 turns. This adjustment is necessary to allow free movement of the balance bar through full pedal travel with the master cylinder pushrods in a parallel position to each other.

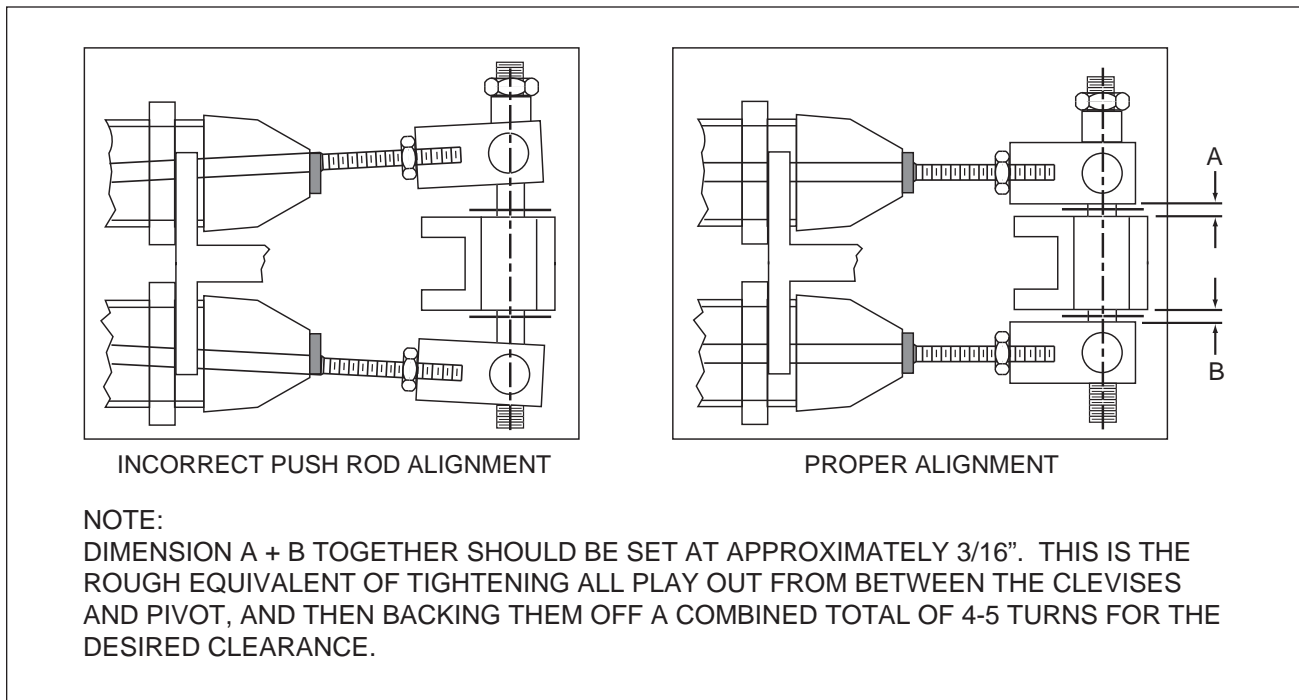


Figure 2. Push Rod Alignment

- The master cylinder mount must be securely attached to a rigid element in the chassis. There should be no movement or deflection at the mount when high pedal effort is applied. The master cylinders can be attached to the balance bar mount before or after it is installed in the car.
- **NOTE: Be sure to follow proper bench bleeding procedures when installing any new master cylinder. All air must be purged from the master cylinder bore and piston chamber prior to attaching the pressure out lines. An effective bleed of the system will be difficult, if not impossible to accomplish if the bench bleeding step is bypassed. Follow the instructions supplied with the master cylinders for bench bleeding instructions.**
- To attach the master cylinders to the balance bar mount, start by first threading the master cylinder pushrods into the clevises on the balance bar. Keep the bolt holes in the mounting flanges aligned over the studs in the aluminum base, but don't tighten them in place yet. Thread the pushrods into the clevises until the tip of the pushrod bottoms out against the clevis pivot pins. Back the pushrods out of the clevis 1/2 to 3/4 of a turn to eliminate any interference between the tip of the pushrods and the clevis pins. Snug the pushrod jam nuts to temporarily secure their position. Final adjustment of the pushrod lengths will occur later in the installation process. Once the pushrods have been installed into the clevises, the master cylinder mounting flanges can then be secured to the mount with the nuts and washers supplied with the balance bar mount kit.
- Before installing the adjuster knob onto the top side of the threaded balance bar rod, rotate the balance bar clockwise until the balance bar pivot bearing bottoms out against the lower master cylinder clevis. Thread the knob onto the balance bar until the tip is flush with the upper outside edge of the top clevis. Lock it in place with the set screw inside the knob. This will provide approximately 3/8" of thread engagement between the knob and threaded rod. If the adjuster knob is set too deeply, it will cause interference with the clevis and prevent full range adjustability of the balance bar.

General Pushrod Length Adjustment Procedures

- Once the system has been fully bled, stabilized, and checked for leaks, the master cylinder pushrod lengths must be adjusted for proper travel and pivoting of the balance bar assembly
- If all four brake calipers have the same number of pistons of the same size, and both master cylinders have the same bore diameter, adjust the master cylinder pushrods to equal lengths and set the jam nuts against the clevis to lock the pushrods in place.
- For vehicles with different caliper or master cylinder sizes between front and rear, the pushrod lengths must be adjusted to compensate for the difference in master cylinder stroke lengths that occur when using differently sized components within the system. These pushrod length adjustments are necessary to prevent bind in the balance bar bearing that could otherwise be caused by excessive misalignment angle in the bar. See Figure 3.

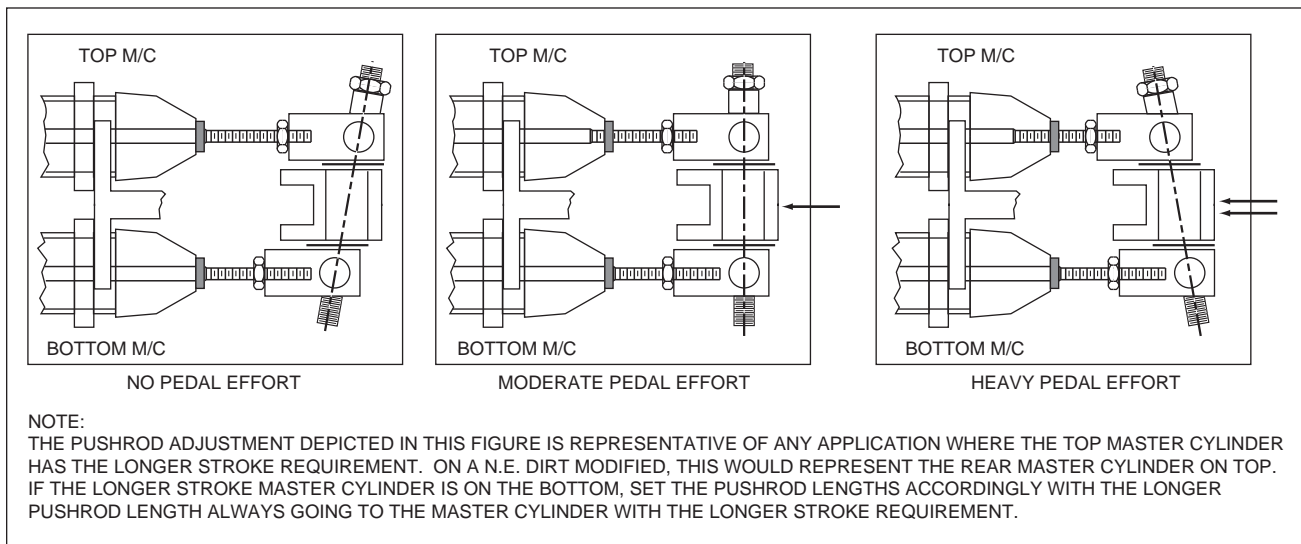


Figure 3. Push Rod Length Adjustment

- To determine the proper pushrod length adjustment, depress the brake pedal through a full range of travel to observe the angle change that occurs in the balance bar and note the difference in stroke lengths between the two master cylinders. Once the master cylinder with the longer stroke requirement has been identified, adjust that pushrod to a longer length that is equal to approximately 1/2 of the total amount of the stroke difference. For example, if one master cylinder has a 1/2" longer stroke requirement than the other, adjust that pushrod to a length that is approximately 1/4" longer. Continue the process until a length setting is achieved that allows the balance bar to be square and perpendicular to the pushrods when the pedal has been depressed to approximately 1/2 of its full travel. This should represent a position that is achieved during a medium stop. The balance bar should then travel over square during a high effort hard stop. The angle change in the balance bar before and after center should be equal. Adjusting the pushrods to compensate for this balance bar angle change through the full range of pedal effort is necessary to prevent bind in the bearing, interference between the bar and the pivot body, ineffective bias control, and potential damage to the balance bar assembly itself.

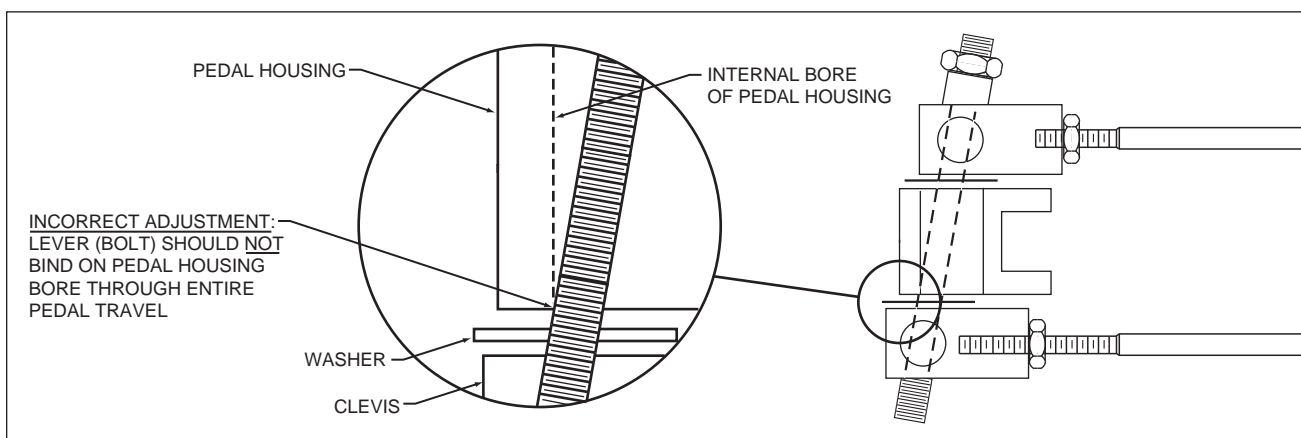


Figure 4. Balance Bar Lever Interference

Centering the Balance Bar

- The balance bar should initially be centered to establish a baseline. It is centered when an equal amount of the threaded rod is protruding from the clevises on both ends. This must be measured before installing the adjuster knob or remote cable. Pressure testing gauges can also be used to determine and monitor balance bar settings
- For vehicles with equal sized master cylinders, the pressure readings will be equal when the balance bar is centered. For vehicles with unequal sized master cylinders, use the baseline chart below to determine your centered balance bar position.

Bore Size	1 1/8"	1"	7/8"	13/16"	3/4"	5/8"
Pressure	242	306	400	464	544	783

- **EXAMPLE:** For a vehicle equipped with a combination of a 7/8" and 1" master cylinder, when the pedal is depressed with sufficient force to generate 400 PSI by the 7/8" master cylinder, the gauge for the 1" cylinder should read at 306 PSI. This represents a centered balance and equal load to each. There should now be an equal amount of adjustment in both directions from center.
- **RACER'S NOTE:** Record and monitor adjusted pressures after each event to help keep track of your preferred bias settings. If you are unable to achieve the proper bias settings within the range of the bar adjustment, differently sized master cylinders or caliper piston sizes may be necessary.
- **NOTE:** Adjustable proportioning valves can be used to supplement dynamic bias control when less bias may be desired at lower pressures, but higher bias is desired at higher pressures. When using a proportioning valve in conjunction with a balance bar, all initial testing should be done with the proportioning valve adjusted out of range. Knob type proportioning valves should be adjusted fully clockwise tight and lever type adjusting valves should be set at the high cam position allow full brake pressure flow throughout the entire pressure range. Once a balanced medium to med-high bias setting is achieved with the balance bar, testing and adjustment of the proportioning valve can be used to provide additional control during intermittent high brake pressure cycles.

Master Cylinders - Compact Combination Remote Fill Kits

<u>Part Number</u>	<u>Description</u>
260-10371	5/8" Bore Kit
260-10372	3/4" Bore Kit
260-10373	13/16" Bore Kit
260-10374	7/8" Bore Kit
260-10375	1" Bore Kit
260-10376	1-1/8" Bore Kit

Service and Installation Parts

<u>Part Number</u>	<u>Description</u>
340-4990	Remote Adjuster Cable
260-0966	Brake Pressure Test Gauge (2 Req'd)
290-2210	Hi-Temp 570° Brake Fluid – 12 oz, 6 pk.
290-0633	Hi-Temp 570° Brake Fluid – Case, 24 Bottle Case
290-8478	EXP 600 Plus racing fluid – 16.09 oz, 6 pk.
290-6210	EXP 600 Plus Racing Fluid – 16.09 oz, 20 Bottle Case
260-8419	Adjustable Proportioning Valve – Knob Adjust
260-8420	Adjustable Proportioning Valve – Lever Adjust

Brake Testing

**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.

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