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# ASSEMBLY INSTRUCTIONS

FOR

# DYNALITE PRO SERIES REAR AXLE KIT WITH 12.19” DIAMETER VENTED ROTOR (2.36 OFFSET)

## BIG BEARING FORD

PART NUMBER GROUP

## 140-2115-B

## DISC BRAKES SHOULD ONLY BE INSTALLED BY SOMEONE KNOWLEDGEABLE AND COMPETENT IN THE FUNCTIONING 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.

## 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.

## Important Notice - Read This First

**Before any tear-down or disassembly begins, review the following information:**

- **Review the wheel clearance diagram (figure 2, page 3) to verify that there is adequate clearance with the wheels you will be using with the installation.**
- **Rear brake kits are not supplied with hydraulic lines or fittings and may require the purchase of additional lines or fittings to compete the installation. Wilwood offers an extensive listing of brake lines and fitting on our web site: www.wilwood.com.**
- **Rear brake kits are not supplied with parking brake cables hardware or adapters. Please see the note in the assembly instructions for vendor recommendations to purchase these parts.**
- **Due to OEM production differences and other variations from vehicle to vehicle, the fastener hardware and other components in this kit may not be suitable for a specific application or vehicle.**
- **It is the responsibility of the purchaser and installer of this kit to verify suitability / fitment of all components and ensure all fasteners and hardware achieve complete and proper engagement. Improper or inadequate engagement can lead to component failure.**

## Exploded Assembly Diagram

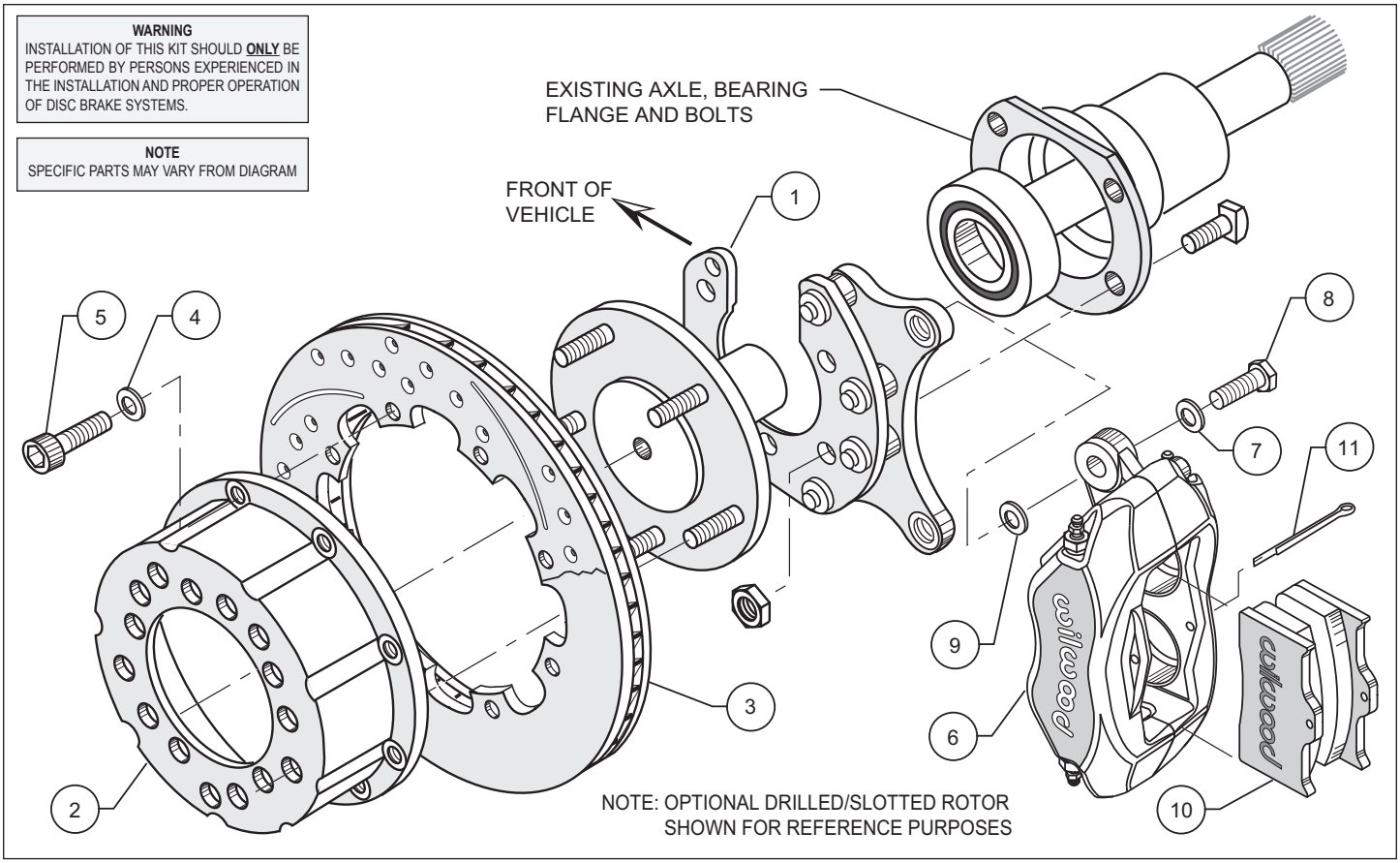



**Figure 1. Typical Installation Configuration**

## Parts List

| ITEM NO. | PART NO. | DESCRIPTION | QTY |
|---|---|---|---|
| 1 | 249-2099/00 | Brackets, Caliper Mounting (pair, one each, left and right) | 1 |
| 2 | 170-1827 | Hat, Rotor Mounting | 2 |
| 3 | 160-5844 | Rotor, .81" Thick x 12.19" Dia, 8 x 7.62" Bolt Circle | 2 |
| 3A | 160-7105/06 | Rotor, Drilled and Slotted (pair, one each, left and right) | 2 |
| 4 | 240-10191 | Washer, .328 I.D. x .562 O.D. x .063 Thick | 16 |
| 5 | 230-0101 | Bolt, 5/16-24 x 0.75 Long, SHCS | 16 |
| 6 | 120-6806 | Caliper, Forged Dynalite | 2 |
| 6A | 120-6791-P | Caliper, Forged Dynalite, Polished | 2 |
| 7 | 240-10190 | Washer, .391 I.D. x .625 O.D. x .063 Thick | 4 |
| 8 | 230-0228 | Bolt, 3/8-24 x 1.25 Long, Hex head | 4 |
| 9 | 240-1159 | Shim, .063 Thick | 16 |
| 10 | 150-8850K | Pad, BP-10, Axle Set | 1 |
| 11 | 180-0055S | Cotter Pin | 2 |

NOTES: Part Number 230-0150 Rotor Bolt Kit, includes part numbers 230-0101 and 240-10191
Part Number 230-0204 Mounting Bolt Kit, includes part numbers 230-0228, 240-10190 and 240-1159
Item 3A is an optional item and is included in the (D) drilled kits.
Item 6A is an optional item and is included in the (P) polished kits.

## General Information and Disassembly Instructions

*Installation of this kit should **ONLY** be performed by persons experienced in the installation and proper operation of disc brake systems.* Before assembling the Wilwood rear axle disc brake kit, double check the following items to ensure a trouble-free installation.

•Make sure this is the correct kit to fit the axle housing flange, not necessarily the rear end make. Many times after market manufacturers put a different make of axle housing flange on the stock rear end housing (see Figure 6). Example; Big Ford rear ends with Olds-Pontiac flanges, therefore, an Olds-Pontiac rear disc brake kit would be the correct kit to order.

•Verify your wheel clearance using Figure 2.

•Inspect the package contents against the parts list to ensure that all components and hardware are included.

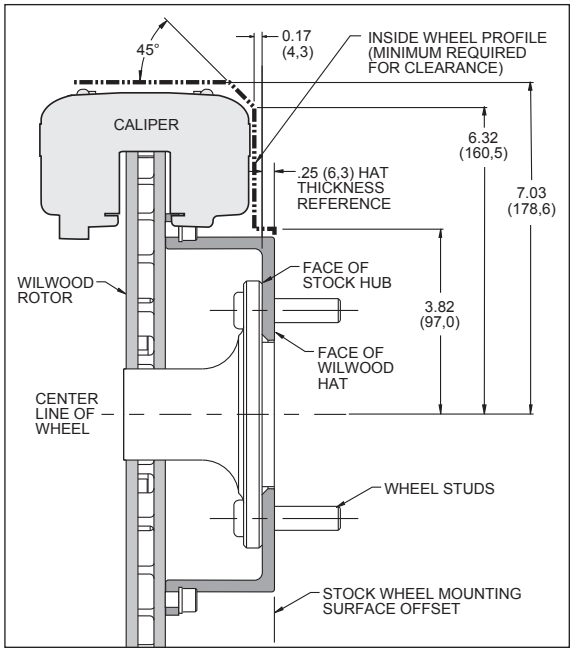



**Figure 2. Wheel Clearance Diagram**

•**<u>Verify The Following Measurements Before Assembly.</u>**

- Bearing outside diameter.
- Axle housing flange mounting pattern to pattern in bracket.
- Stud pattern on axle flange to stud pattern in hat.
- Dimension from wheel side of axle flange to wheel side of axle housing flange (see Figure 6, lower right hand corner). This dimension is critical to ensure proper alignment of the rotor to the caliper, and should match offset given in the kit description.
- Verify that the wheel axle stud size is 0.50" diameter. The Wilwood hats utilized in these kits are drilled for 0.50" diameter wheel studs.
- Maximum axle flange diameter must be no larger than 6.47" w/.050" x 45° chamfer (Figure 3).

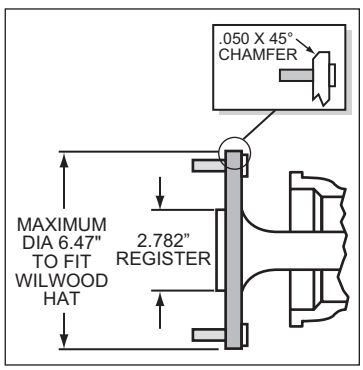



**Figure 3. Axle Flange Maximum Dimension**

**<u>Disassembly Instructions</u>**:

•Disassemble the original equipment rear brakes:

Raise the rear wheels off the ground. Support the rear suspension by placing jack stands under the rear axle or vehicle frame. The vehicle's weight must be on jack stands. The vehicle must not be supported by a car jack or hoist.

Completely disassemble the stock brake system down to the bare axle. Degrease and remove any dings or burrs on the housing flange as well as the axle flange which may interfere with the brake assembly. Assemble the axle into the rear end housing.

## Assembly Instructions

**Assembly Instructions** (numbers in parenthesis refer to the part list/diagram on the preceding page): ***CAUTION:*** *All mounting bolts must fully engage insert nuts. Be sure to check that all bolts are either flush or protruding through flanged side of insert nut after shimming.*

•With the slot pointing upward and the mounting ears pointing towards the rear of the vehicle, install the caliper mounting bracket (1) to the housing flange using the stock Original Equipment Manufacturer (OEM) bolts and nuts. Stock OEM hex nuts that retain the bracket (1) should be on the wheel side of the bracket. Apply red *Loctite*® 271 to the stock OEM bolt threads and torque to OEM specifications. ***NOTE****: Some brackets act as the bearing retainers, while others help locate the bearing in the axle housing flange.* If the stock bearing plates are still on the axle, the caliper mounting brackets (1) should be located between the axle housing flange and the bearing retainer plate. Make sure the heads of the caliper mounting bracket insert nuts are FACING OUTWARD TOWARDS THE WHEEL.

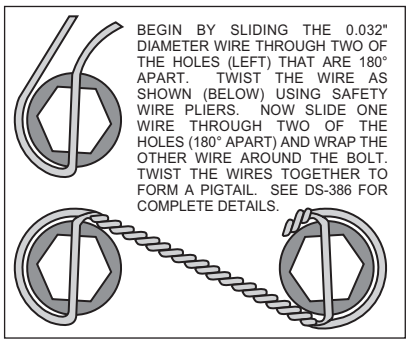



**Figure 4. Safety Wire Diagram**

•Bolt the hat (2) to the rotor (3) using washers (4) and bolts (5). Torque bolts (5) to 180 **in-lb**. Safety wire bolts (5) using standard 0.032 inch diameter stainless steel safety wire as shown in Figure 4. Please refer to Wilwood's data sheet DS-386 (available at www.wilwood.com/Pdf/DataSheets/ds386.pdf) for complete safety wire installation instructions.

•Align the correct hole pattern in the hat (2) with the stud pattern on the axle flange. ***NOTE:*** *Some OEM and after market axles come with stud sizes larger than 0.50" diameter.* Verify stud size and have a qualified machine shop drill the hats to the correct size. Slide the hat/rotor assembly (2 and 3) over the wheel studs and against the axle flange face.

•***NOTE:*** *Please reference the caution statement at the beginning of the assembly instructions.* WITH THE BLEED SCREWS POINTING UP, mount the caliper (6) over the rotor (3) and onto the caliper mounting bracket (1) using washers (7) and mounting bolts (8). View the rotor through the top opening of the caliper. The rotor should be aligned in the center of the caliper. If not, adjust the caliper by using 0.032 inch shim washers (9), placing them between the caliper mounting bracket (1) and the caliper (6). Add as many shim washers (9) as necessary to achieve the correct alignment. ***NOTE:*** *The end of the bolt must be flush with or slightly protuding from the head of the clinch nut. See Figure 5.* Place spare shims (9) between washer and caliper mounting ear to achieve the proper mounting fastener configuration. Always use the same amount of shims on both the top and bottom caliper mounting bolts (8). Apply red *Loctite*® 271 to the mounting bolt threads (8), torque bolts to 30 ft-lb. Safety wire the caliper mounting bolts (8).

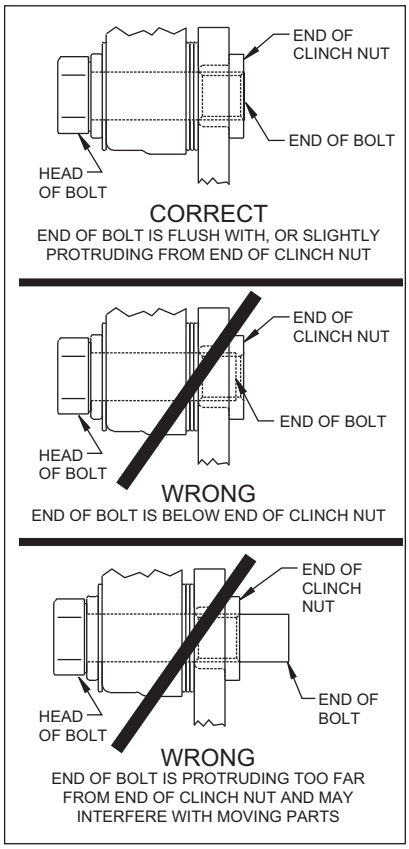



**Figure 5.**
**Clinch Nut Engagement Diagram**

•Position the Wilwood disc brake pads (10) into the caliper (6) and fasten with cotter pin (11). Steel backing plate side of brake pad should face the caliper pistons.

•Repeat this procedure for the other wheel/brake assembly.

•***NOTE****: OEM rubber brake hoses generally cannot be adapted to Wilwood calipers. The caliper inlet fitting is a 1/8-27 NPT*. The preferred method is to use steel adapter fittings at the caliper, either straight, 45 or 90 degree and enough steel braided line to allow for full suspension travel and turning radius, lock to lock. **Carefully route lines to prevent contact with moving suspension, brake or wheel components.** Wilwood hose kits are designed for use in many different vehicle applications and it is the installer's responsibility to properly route and ensure adequate clearance and retention for brake hose components.

•Specified brake hose kits may not work with all Years, Makes and Models of vehicle that this brake kit is applicable to, due to possible OEM manufacturing changes during a production vehicle's life. It is the installer's responsibility to ensure that all fittings and hoses are the correct size and length, to ensure proper sealing and that they will not be subject to crimping, strain and abrasion from vibration or interference with suspension components, brake rotor or wheel.

## Assembly Instructions (Continued)

•In absence of specific instructions for brake line routing, the installer must use his best professional judgment on correct routing and retention of lines to ensure safe operation. Test vehicle brake system per the 'minimum test' procedure stated within this document before driving. After road testing, inspect for leaks and interference. Initially after install and testing, perform frequent checks of the vehicle brake system and lines before driving, to confirm that there is no undue wear or interference not apparent from the initial test. Afterwards, perform periodic inspections for function, leaks and wear in a interval relative to the usage of vehicle.

• Bleed the brake system. Reference the general information and recommendations on page 6 for proper bleeding instructions.

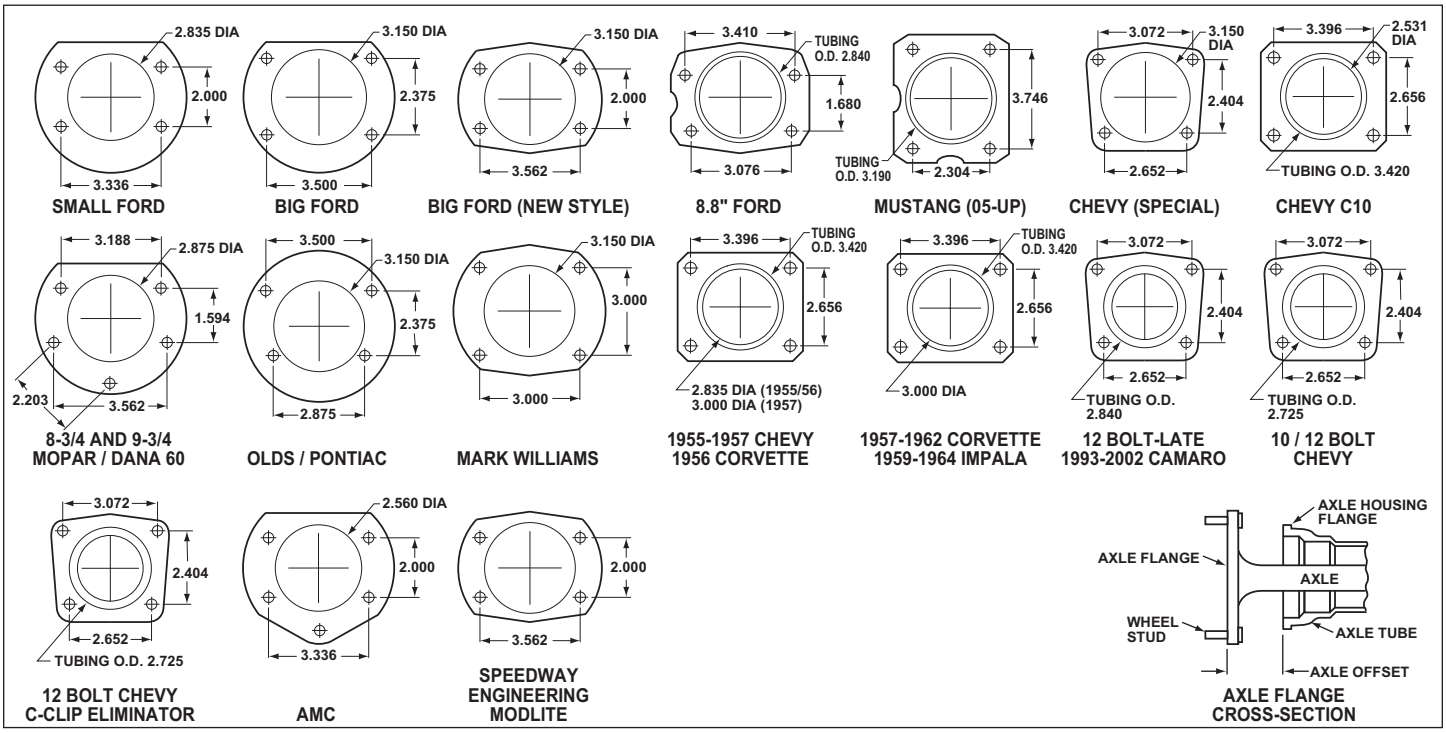



**Figure 6. Rear Housing Flange Chart and Axle Flange / Offset Cross-Section**

## Balancing the Brake Bias on 4 Wheel Disc Vehicles

•OE Style or Single Mount Race Pedal with Tandem Outlet Master Cylinder:
Front to rear caliper piston sizes, rotor diameters, and pad compounds must be initially configured to provide the correct range of vehicle bias when using a single bore / tandem outlet master cylinder. If excessive rear brake bias is experienced, an inline adjustable proportioning valve can be used to decrease the rear line pressure to help bring the vehicle into balance. If excessive front brake bias is experienced, first consideration should be given to increasing the rear brake bias to bring the vehicle into overall balance.

•Race Pedal with Dual Master Cylinders and Balance Bar:
Master cylinders must be sized to match the calipers and allow the pedal balance bar to operate near the center of its travel. If it is not possible to fine tune the bias within the adjustable range of the balance bar, then consideration must be given to changing a master cylinder bore size or some other aspect of the brake system to bring the car into balance. Larger bore master cylinders will generate less pressure while decreasing pedal travel. Smaller bores master cylinders will generate higher line pressures with an increase in pedal travel.

## Additional Information and Recommendations

•Fill and bleed the new system with Wilwood Hi-Temp° 570 grade fluid or higher. For severe braking or sustained high heat operation, use Wilwood EXP 600 Plus Racing Brake Fluid. Used fluid must be completely flushed from the system to prevent contamination. ***NOTE:*** *Silicone DOT 5 brake fluid is* ***NOT*** *recommended for racing or performance driving*.

•To properly bleed the brake system, begin with the caliper farthest from the master cylinder. Bleed the outboard bleed screw first, then the inboard. Repeat the procedure until all calipers in the system are bled, ending with the caliper closest to the master cylinder. ***NOTE:*** *When using a new master cylinder, it is important to bench bleed the master cylinder first.*

•If the master cylinder is mounted lower than the disc brake calipers, some fluid flowback to the master cylinder reservoir may occur, creating a vacuum effect that retracts the caliper pistons into the housing. This will cause the pedal to go to the floor on the first stroke until it has "pumped up" and moved all the pistons out against the pad again. A Wilwood in-line two pound residual pressure valve, installed near the master cylinder will stop the fluid flowback and keep the pedal firm and responsive.

•Test the brake pedal. It should be firm, not spongy and stop at least 1 inch from the floor under heavy load.

If the brake pedal is spongy, bleed the system again.

If the brake pedal is initially firm, but then sinks to the floor, check the system for fluid leaks. Correct the leaks (if applicable) and then bleed the system again.

If the brake pedal goes to the floor and continued bleeding of the system does not correct the problem, a master cylinder with increased capacity (larger bore diameter) will be required. Wilwood offers various lightweight master cylinders with large fluid displacement capacities.

•***NOTE:*** *With the installation of after market disc brakes, the wheel track may change depending on the application.* Check your wheel offset before final assembly.

•On some models of disc brake spindles there are "ears" where the OEM calipers were mounted and these "ears" interfere with the assembly of the Wilwood disc brake kit. If it becomes necessary to remove these "ears", remove as little as possible being careful not to cut away any of the mounting holes that may be required to bolt on the caliper mounting bracket.

•If after following the instructions, you still have difficulty in assembling or bleeding your Wilwood disc brakes, consult your local chassis builder, or retailer where the kit was purchased for further assistance.

## Brake Testing and Pad Bedding

**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.

**PAD BEDDING PROCEDURE:**

•Pump brakes at low speed to assure proper operation. On the race track, or other safe location, make a series of hard stops until some brake fade is experienced. Allow brakes to cool while driving at moderate speed to avoid use of the brakes. This process will properly burnish the brake pads, offering maximum performance.

## Associated Components

| PART NO. | DESCRIPTION |
|---|---|
| 260-1874 | Wilwood Residual Pressure Valve (2 lb for disc brakes) |
| 260-1876 | Wilwood Residual Pressure Valve (10 lb for drum brakes) |
| 260-8419 | Wilwood Proportioning Valve |
| 290-0632 | Wilwood Racing Brake Fluid (Hi-Temp° 570) (12 oz) |
| 290-6209 | Wilwood Racing Brake Fluid (EXP 600 Plus) (16.9 oz) |
| 340-1285 | Wilwood Floor Mount Brake Pedal (with balance bar) |
| 340-1287 | Wilwood Swing Mount Brake Pedal (with balance bar) |
| 260-6764 | Wilwood 3/4 inch High Volume Aluminum Master Cylinder |
| 260-6765 | Wilwood 7/8 inch High Volume Aluminum Master Cylinder |
| 260-6766 | Wilwood 1 inch High Volume Aluminum Master Cylinder |
| 260-4893 | 1-1/16 inch Tandem Master Cylinder (aluminum housing) |
| 250-2406 | Mounting Bracket Kit (tandem master cylinder) |
| 260-8555 | Wilwood 1 inch Aluminum Tandem Chamber Master Cylinder |
| 260-8556 | Wilwood 1-1/8 inch Aluminum Tandem Chamber Master Cylinder |
| 350-2038 | 1971 - 1973 Pinto Rack and Pinion (new, not rebuilt) |
| 270-2016 | Quick Release Steering Hub (3/4 inch shaft) |
| 270-2017 | Quick Release Steering Hub (5/8 inch shaft) |
| 220-7056 | Flexline Kit, Universal, 14 Inch, Domestic |
| 220-7699 | Flexline Kit, Universal, 16 Inch, Domestic |
| 220-8307 | Flexline Kit, Universal, 18 Inch, Domestic |