

**ASSEMBLY INSTRUCTIONS**  
FOR  
**REAR AXLE DISC / DRUM INTERNAL PARKING BRAKE KIT**  
**WITH 12.19" DIAMETER VENTED ROTOR (2.50 OFFSET)**

**SMALL BEARING FORD**

PART NUMBER GROUP

**140-9302**

**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](http://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.



Need Additional Information?  
Use Your SmartPhone and  
Jump to Our Technical Tips  
Section on Our Web Site.



**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 complete the installation. Wilwood offers an extensive listing of brake lines and fittings on our web site: [www.wilwood.com](http://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.
- 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

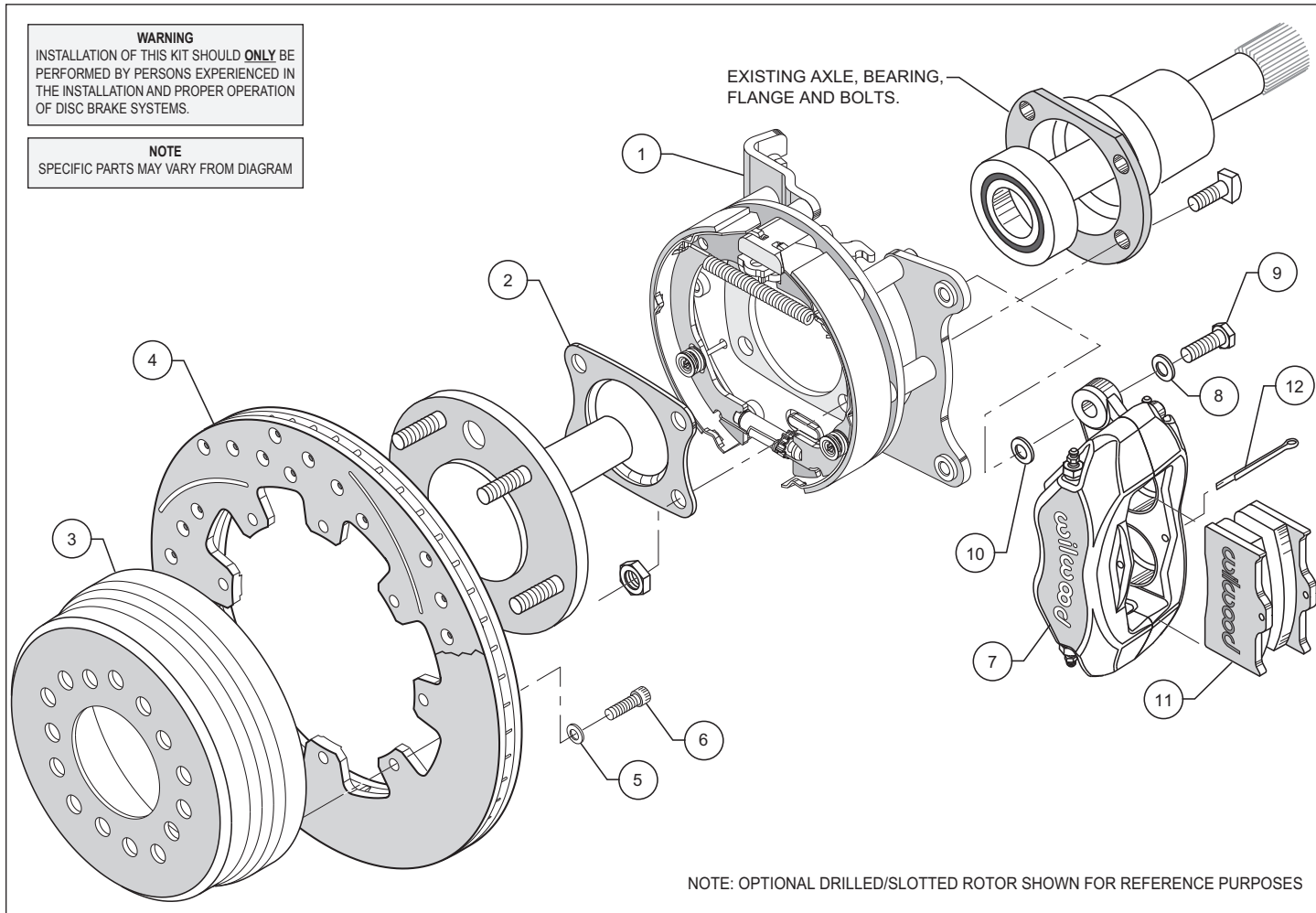


Figure 1. Typical Installation Configuration

## Parts List

ITEM NO.	PART NO.	DESCRIPTION	QTY
1	249-9303/04	Bracket Kit (pair, one each, left and right)	1
2	250-6287	Retainer, Bearing	2
3	170-6239	Hat, 2.39" offset, 8 x 7.78 Bolt Circle	2
4	160-6218	Rotor, UL .81" Thk x 12.19" Dia, 8 x 7.78" Bolt Circle	2
4A	160-6924/25	Rotor, Drilled and Slotted (pair, one each)	2
5	240-2509	Washer, .250 I.D. x .500 O.D. x .063 Thick	16
6	230-6312	Bolt, 1/4 x 28 x 1.00 Long, SHCS	16
7	120-9703	Caliper, Forged Dynalite	2
7A	120-6791-P	Caliper, Forged Dynalite, Polished	2
8	240-0140	Washer, Lock	4
9	230-0228	Bolt, 3/8-24 x 1.25 Long, HXHD	4
10	240-1159	Washer, .375 I.D. x .875 O.D. x .035 Thick	12
11	150-9136K	Pads, BP-10, Axle Set	1
12	180-0054S	Cotter Pin	2

NOTES: Part Number 250-6287 is included with the bracket kit assembly 249-9303/04  
 Part Number 230-6409 Rotor Bolt Kit, includes part numbers 230-6312 and 240-2509  
 Part Number 230-0204 Mounting Bolt Kit, includes P/N's 230-0228, 240-0140 and 240-1159  
 Item 4A is an optional item and is available in the (D) Drilled kits  
 Item 7A is an optional item and is available 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. Also, shock clearance may be a problem. They may have to be modified and/or relocated to clear the Wilwood kit after final assembly.
- Inspect the package contents against the parts list to ensure that all components and hardware are included.

### •Verify The Following Measurements Before Assembly.

- 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 6.61" w/.050" x 45° chamfer (see Figure 3, next page).

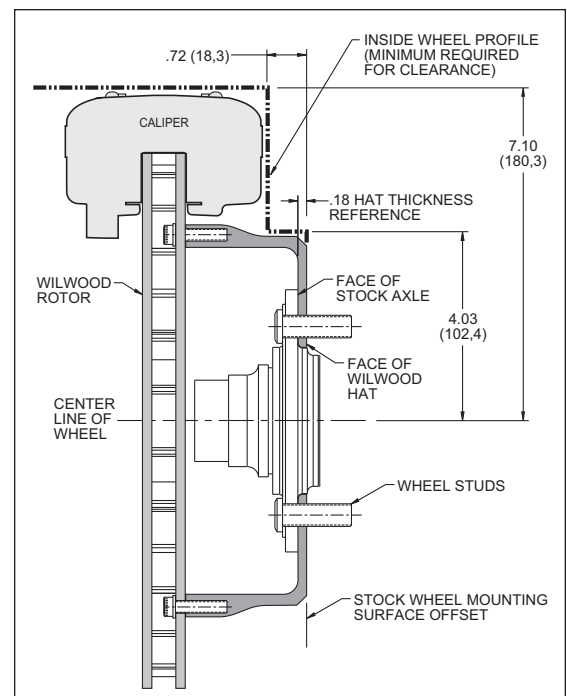


Figure 2. Wheel Clearance Diagram

**Disassembly Instructions** (numbers in parenthesis refer to the part list above and 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.**

- 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.

## Disassembly (Continued) and Assembly Instructions

Disassemble the stock brake system down to the bare axle utilizing a qualified machine shop to press off axle bearing and OEM retainer. Have the machine shop install new retainer (2), supplied with bracket kit with the lip facing towards the bearing, Figure 4 (we suggest you install a new bearing at this time, not supplied in the kit). Degrease and remove any dings or burrs on the housing flange as well as the axle flange which may interfere with the brake assembly.

### Assembly Instructions

- Slide the caliper mounting bracket kit assembly (1) onto the housing flange and then insert the axle assembly through the center hole of the caliper mounting bracket assembly (1). Align the bearing retainer (2) with the four holes inside the bracket assembly (1) and secure using the stock OEM bolts and nuts. Stock OEM hex nuts that retain the caliper mounting bracket assembly (1) and retainer (2) should be on the wheel side of the bracket. Apply red *Loctite*® 271 to the stock OEM bolt threads and torque to OEM specifications. Make sure the heads of the caliper mounting bracket assembly (1) insert nuts are FACING OUTWARD TOWARDS THE WHEEL.

- Bolt the hat (3) to the rotor (4) using washers (5) and bolts (6). Torque bolts (6) to 103 in-lb. Safety wire rotor bolts (6) using standard 0.032 inch diameter stainless steel safety wire as shown in Figure 5. Please refer to Wilwood's data sheet DS-386 (available at [www.wilwood.com/Pdf/DataSheets/ds386.pdf](http://www.wilwood.com/Pdf/DataSheets/ds386.pdf)) for complete safety wire installation instructions.

- Align the correct hole pattern in the hat (3) 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 (3 and 4) over the wheel studs covering the mounting bracket assembly (1) 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 (7) over the rotor (4) and onto the caliper mounting bracket (1) using washers (8) and mounting bolts (9). 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 shims (10) by placing them between the caliper mounting bracket (1) and the caliper (7). Apply red *Loctite*® 271 to the mounting bolt threads (9), torque to 30 ft-lb. Safety wire the caliper mounting bolts (9).

- Position the Wilwood disc brake pads (11) into the caliper (7) and fasten with cotter pin (12). Steel backing plate side of brake pad should face the caliper pistons.

- NOTE:** Clevis and cable kits which attach to the parking brake assembly are not included in the Wilwood parking brake kit. Wilwood offers a generic style parking brake cable kit, P/N 330-9371 for this application which can be ordered separately from your local Wilwood dealer or by calling Wilwood customer service at (805) 388-1188.

- Before final installation of the wheel, install a couple of lug nuts and adjust the parking brake shoes outward (using a drum shoe adjustment tool available at your local auto parts store) while spinning the hat (3) until a slight drag is felt again the hat/drum.

- 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.

- 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.

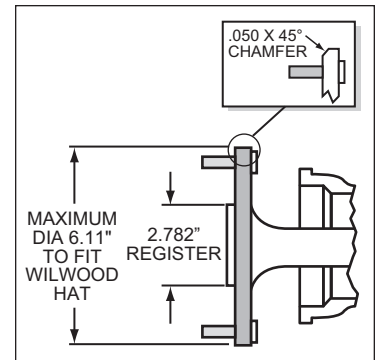


Figure 3. Axle Flange Maximum Dimension

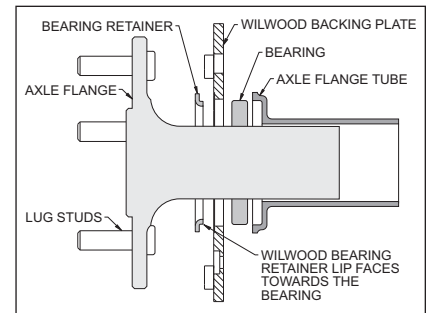


Figure 4. Retainer / Axle Diagram

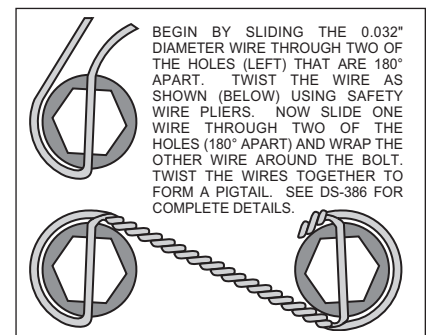


Figure 5. Safety Wire Diagram

## Assembly Instructions (Continued)

•Repeat assembly procedure for the other wheel.

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

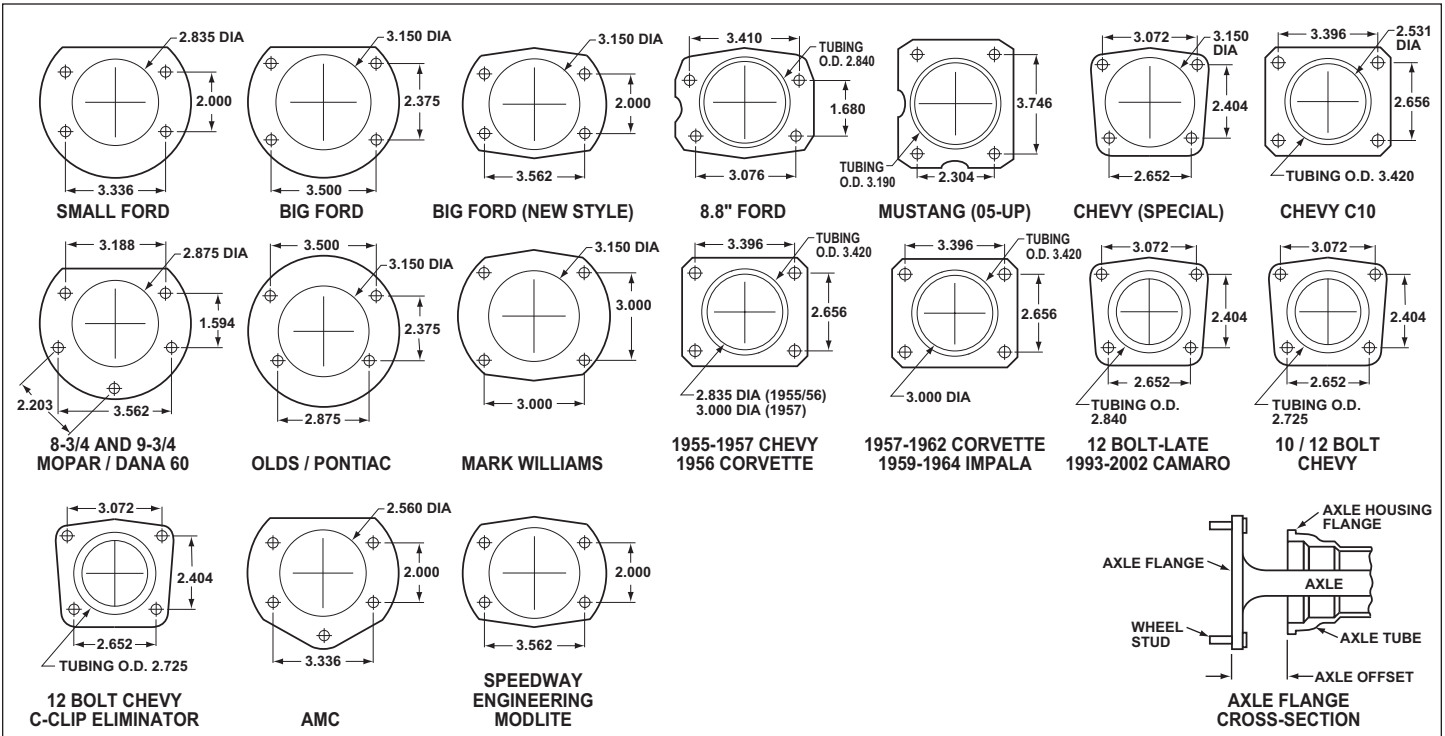


Figure 6. Rear Housing Flange Chart and Axle Flange / Offset Cross-Section

## Additional Information and Recommendations

•**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.*

•Please read the following concerning balancing the brake bias on 4 wheel disc vehicles.

This brake kit can be operated using the stock OEM master cylinder and proportioning system. However, as with most suspension and tire modifications (from OEM specifications), changing the brakes may alter the front to rear brake bias. Rear brakes should not lock up before the front. Brake system evaluation and tests should be performed by persons experienced in the installation and proper operation of brake systems. Evaluation and tests should be performed under controlled conditions. Start by making several stops from low speeds then gradually work up to higher speeds. Always utilize safety restraint systems while operating vehicle.

Use a Wilwood adjustable proportioning valve if necessary to achieve proper brake balance, or use a Wilwood brake pedal/balance bar assembly with dual master cylinders (requires custom mounting as used in fabricated chassis race cars). A balance bar brake system permits incremental front to rear brake pressure adjustments.

•For optimum performance, fill and bleed the new system with Wilwood Hi-Temp<sup>o</sup> 570 grade fluid or EXP 600 Plus. 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. If the caliper is fitted with bleed screws on four corners, make sure the bottom bleed screws are tight. Only bleed from the top bleed screws. **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 2 lb. 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 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, either air may be trapped in the system, or a master cylinder with increased capacity (larger bore diameter) may be required. Wilwood offers various lightweight master cylinders with large fluid displacement capacities (custom fabricated mounting may be required).

## 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

<b><u>PART NO.</u></b>	<b><u>DESCRIPTION</u></b>
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