

ASSEMBLY INSTRUCTIONS
FOR
12 BOLT CHEVROLET, "C" CLIP ELIMINATOR*
*For additional vehicle compatibility, visit www.wilwood.com

REAR AXLE DISC BRAKE KIT
VENTED ROTOR TYPE, PARKING BRAKE (2.91 OFFSET)

BASE PART NUMBER
140-5237-B

**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.



Need Additional Information?
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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

NOTE:

This disc brake kit is designed for use with most "C" Clip Eliminator kits manufactured for after market disc brake kits. Contact the manufacturer if you have questions regarding the compatibility of this brake kit.

Photographic Tip

Important and highly recommended: Take photos of brake system before disassembly and during the disassembly process. In the event, trouble-shooting photos can be life savers. Many vehicles have undocumented variations, photos will make it much simpler for Wilwood to assist you if you have a problem.

Exploded Assembly Diagram

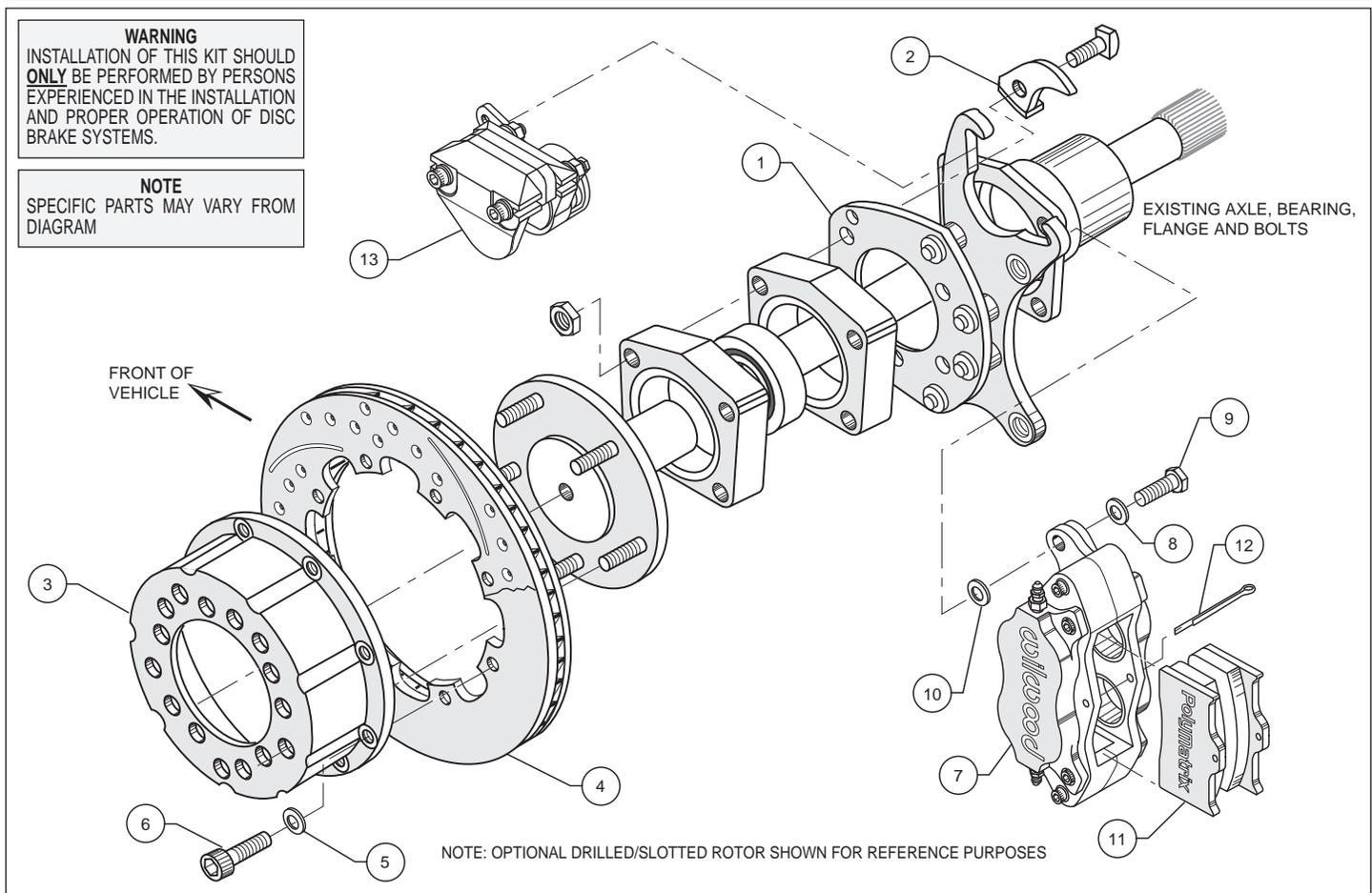


Figure 1. Typical Installation Configuration

Parts List

ITEM NO.	PART NO.	DESCRIPTION	QTY
1	249-5232/33	Brackets, Caliper Mounting (pair, one each, left and right)	1
2	250-2255	Cable Stop (RH)	1
2	250-2256	Cable Stop (LH)	1
3	170-1827	Hat, Rotor Mounting	2
4	160-0276	Rotor	2
4A	160-7105/06	Rotor, Drilled and Slotted (pair, one each, left and right)	2
5	240-10191	Washer, .328 I.D. x .562 O.D. x .063 Thick	16
6	230-0101	Bolt, 5/16-24 x 0.75 Long, SHCS	16
7	120-6806	Caliper, Forged Dynalite	2
7A	120-6806-RD	Caliper, Forged Dynalite, Red	2
8	240-10190	Washer, .391 I.D. x .625 O.D. x .063 Thick	4
9	230-0228	Bolt, 3/8-24 x 1.25 Long, Hex Head	4
10	240-1159	Shim, .032 Thick	16
11	150-8850K	Pad, BP-10 Axle Set	1
12	180-0055S	Cotter Pin	2
13	120-2280/81	Caliper, Mechanical (RH/LH)	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 4A is an optional item and is included in the (D) drilled rotor kits. Add -D to end of part number when ordering.

Item 7A is an optional item and is included in the (R) red caliper kits. Add -R to end of part number when ordering.

General Information and Assembly 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 5). Example; Big Ford rear ends with Olds-Pontiac flanges, therefore, an Olds-Pontiac rear disc brake kit would be the correct kit to order.
- 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.
- Axle center register diameter is 3.06", Figure 2. Rotors can either be centered on the axle register, i.e. *register-centric* or centered on the wheel studs, i.e. *stud-centric*. Due to variations in wheel stud final diameters, *register-centric* centering can be a more accurate method of centering the rotor to the axle. Wilwood offers various diameter adapters for purchase, see Table 1.
- Dimension from wheel side of axle flange to wheel side of axle housing flange (see Figure 5, 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.
- The Wilwood hat utilized in this kit is drilled for 1/2" diameter wheel studs. **NOTE:** Some OEM axles have 7/16" (0.44") wheel axle studs. It is recommended that you upgrade to 1/2" studs. Dependent on the type of axle, this may be a simple stud change, or may require the services of a machine shop to perform.
- Maximum axle flange diameter must be no larger than 6.47" w/.050" x 45° chamfer (Figure 2).

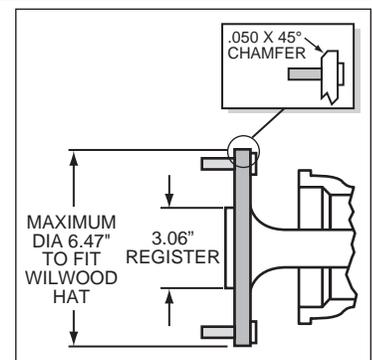


Figure 2. Axle Flange Maximum Dimension

This kit includes a 3.06" center I.D. hat or rotor assembly. For axles with different center register diameters, please consult the table below for optional adapter ring sizes.

PART NO.	REGISTER I.D.	NOTE
NO ADAPTER USED	3.06"	ROTOR CENTER HOLE I.D.
300-13328	2.88"	OPTIONAL
300-11732	2.86"	OPTIONAL
300-11962	2.84"	OPTIONAL
300-11338	2.82"	OPTIONAL
300-11337	2.80"	OPTIONAL
300-11532	2.78"	OPTIONAL
300-11803	2.52"	OPTIONAL
300-11901	2.50"	OPTIONAL
300-11653	2.18"	OPTIONAL
300-11339	2.00"	OPTIONAL (Machine to fit I.D.)

Table 1. Center Register Adapters

Assembly Instructions (numbers in parenthesis refer to the parts list/diagram on the preceding page):

- 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.

Assembly Instructions (Continued)

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 C-clip eliminator to the axle per the manufacturers instructions.

- With the mounting ears pointing towards the rear of the vehicle, install the caliper mounting bracket (1) to the housing flange using the bolts and nuts supplied with the C-clip eliminator kit. Apply red *Loctite*® 271 to the bolt threads and torque to OEM specifications. **NOTE:** *The caliper mounting brackets (1) should be located between the axle housing flange and the inner C-clip hub. Make sure the heads of the caliper mounting bracket insert nuts are FACING OUTWARD TOWARDS THE WHEEL.*

- Install the cable stop bracket (2) on the top front hole on the in-board side of the housing flange with the tab pointing toward the rear of the vehicle, held in place with the final bolt retaining the caliper mounting bracket (1). Apply red *Loctite*® 271 to the stock OEM bolt threads and torque to OEM specifications.

- Bolt the hat (3) to the rotor (4) using washers (5) and bolts (6). Torque bolts (6) to 180 **in-lb**. Safety wire rotor bolts (6) using standard 0.032 inch diameter stainless steel safety wire as shown in Figure 3. Please refer to Wilwood's data sheet DS-386 (available at www.wilwood.com/pdf/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 and against the axle flange face.*

- 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). Add as many shim washers (10) as necessary to achieve the correct alignment. **NOTE:** *The end of the bolt must be flush with or slightly protruding from the head of the clinch nut. See Figure 4.* Place spare shims (10) 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 (9). 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.

- Disassemble the mechanical parking brake caliper (13) before mounting. Replace the bullet pin (rounded side against moving arm), steel pad backing plate and brake pad in the operating half of the mechanical caliper. Slide operating half of caliper onto the in-board side of the bracket with moving arm pointing toward the front of the vehicle. Mount outboard half of caliper on opposite side of rotor with the two spacers located between the caliper halves. Bolt mechanical caliper assembly together with 3/8-24 bolts provided with the mechanical caliper. The mechanical caliper should slide on the bracket ears at this point. Loosen the adjusting nut on the operating half of the mechanical caliper. Lift the arm up to its highest point and adjust the bolt until the arm can only move down between 1/4 inch to 3/8 of an inch until pressure is applied to the rotor, then tighten the adjusting nut. After the parking brake has been used a few times, it may need to be readjusted. **NOTE:** *Clevis and cable kits which attach to the mechanical arm are not included in the Wilwood parking brake kit. Because of the numerous variations it is impossible to supply a generic style that would be applicable to all applications. Gennie Shifter, and their distributors carry a complete line of cable kits and accessories that will fit this system. They can be reached at 626 • 337-2536. Specify a Clevis kit with a 1/4 inch pin.*

- 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.*

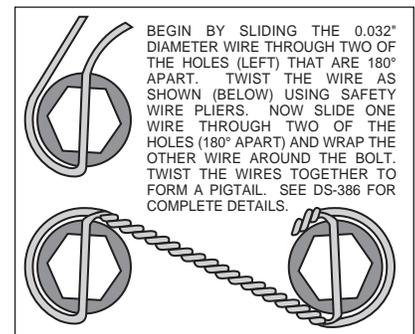


Figure 3. Safety Wire Diagram

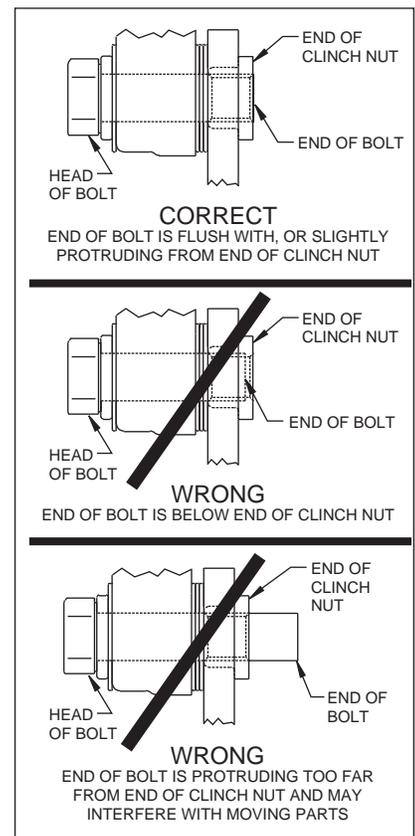


Figure 4. Clinch Nut Engagement Diagram

Assembly Instructions (Continued)

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

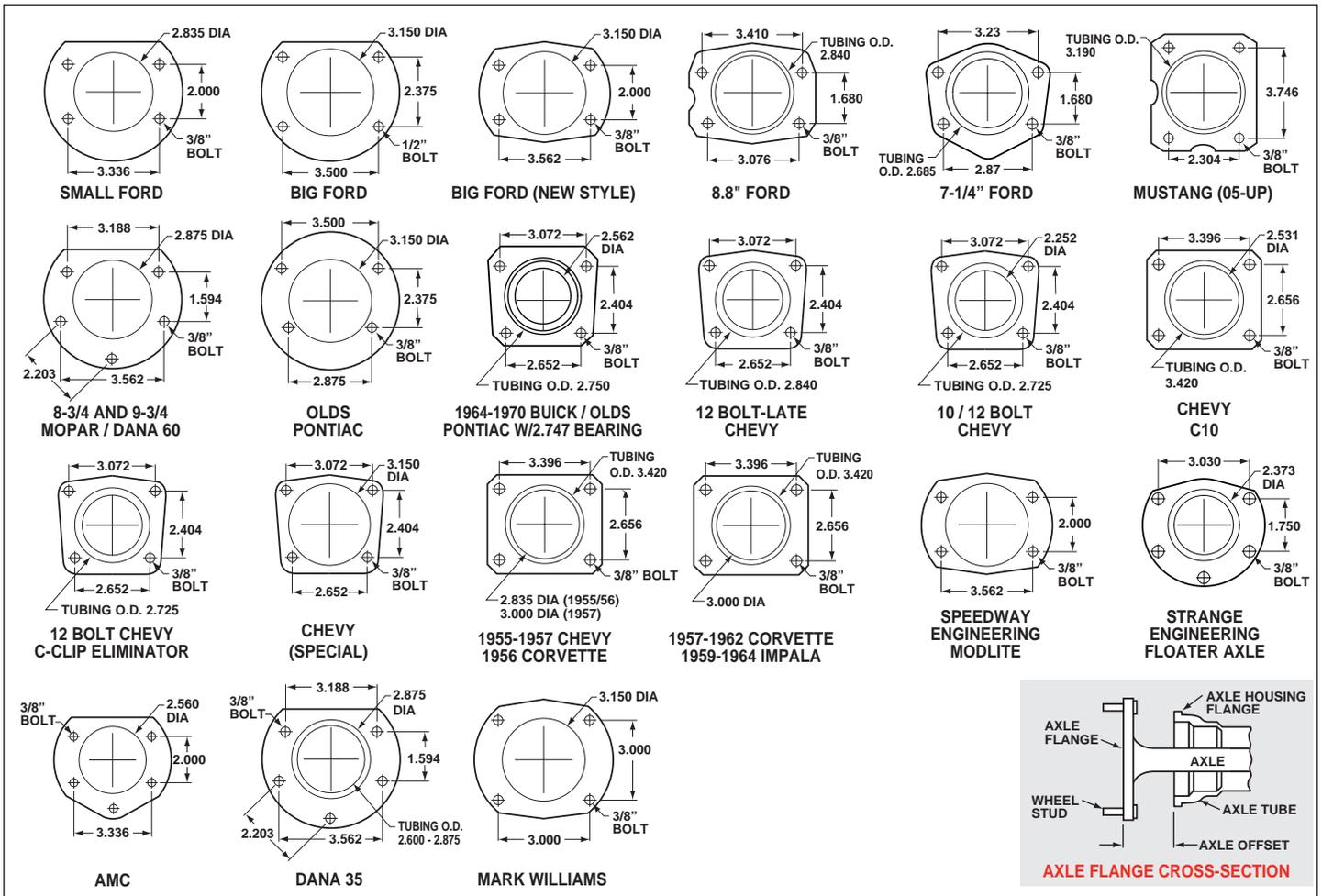


Figure 5. Rear Housing Flange Chart and Axle Flange / Offset Cross-Section

Additional Information and Recommendations

- With the Wilwood disc brake system completely installed, use either of the two methods listed to balance the brake bias front to rear.

The Most Efficient Method:

A Wilwood brake pedal/balance bar assembly (either floor or swing mount) and two single master cylinders (either two 7/8 inch or two 1 inch) mounted side by side. Dialing the balance bar left or right transfers the pressure from front to rear, or rear to front and allows the smallest of pressure adjustments to be made without any loss to the overall brake system line pressure.

The More Popular Method:

An OEM 1-1/16 inch bore dual outlet master cylinder with a Wilwood adjustable proportioning valve plumbed into either the front or rear brake line. **NOTE:** A proportioning valve is an in-line pressure reducing device. Output pressure is reduced proportionally to input pressure. Net result is that the line pressure is reduced, forcing the remaining brakes to do more of the work.

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

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 and Rotor Bedding

BEDDING STEPS FOR NEW PADS AND ROTORS – ALL COMPOUNDS

Once the brake system has been tested and determined safe to operate the vehicle, follow these steps for the bedding of all new pad materials and rotors. These procedures should only be performed on a race track, or other safe location where you can safely and legally obtain speeds up to 65 MPH, while also being able to rapidly decelerate.

- Begin with a series of light decelerations to gradually build some heat in the brakes. Use an on-and-off the pedal technique by applying the brakes for 3-5 seconds, and then allow them to fully release for a period roughly twice as long as the deceleration cycle. If you use a 5 count during the deceleration interval, use a 10 count during the release to allow the heat to sink into the pads and rotors.
- After several cycles of light stops to begin warming the brakes, proceed with a series of medium to firm deceleration stops to continue raising the temperature level in the brakes.
- Finish the bedding cycle with a series of 8-10 hard decelerations from 55-65 MPH down to 25 MPH while allowing a proportionate release and heat-sinking interval between each stop. The pads should now be providing positive and consistent response.
- If any amount of brake fade is observed during the bed-in cycle, immediately begin the cool down cycle.
- Drive at a moderate cruising speed, with the least amount of brake contact possible, until most of the heat has dissipated from the brakes. Avoid sitting stopped with the brake pedal depressed to hold the car in place during this time. Park the vehicle and allow the brakes to cool to ambient air temperature.

COMPETITION VEHICLES

- If your race car is equipped with brake cooling ducts, blocking them will allow the pads and rotors to warm up quicker and speed up the bedding process.
- Temperature indicating paint on the rotor and pad edges can provide valuable data regarding observed temperatures during the bedding process and subsequent on-track sessions. This information can be highly beneficial when evaluating pad compounds and cooling efficiencies.

POST-BEDDING INSPECTION – ALL VEHICLES

- After the bedding cycle, the rotors should exhibit a uniformly burnished finish across the entire contact face. Any surface irregularities that appear as smearing or splotching on the rotor faces can be an indication that the brakes were brought up to temperature too quickly during the bedding cycle. If the smear doesn't blend away after the next run-in cycle, or if chatter under braking results, sanding or resurfacing the rotors will be required to restore a uniform surface for pad contact.

PRE-RACE WARM UP

- Always make every effort to get heat into the brakes prior to each event. Use an on-and-off the pedal practice to warm the brakes during the trip to the staging zone, during parade laps before the flag drops, and every other opportunity in an effort to build heat in the pads and rotors. This will help to ensure best consistency, performance, and durability from your brakes.

DYNO BEDDED COMPETITION PADS AND ROTORS

- Getting track time for a proper pad and rotor bedding session can be difficult. Wilwood offers factory dyno-bedded pads and rotors on many of our popular competition pads and **Spec 37** GT series rotors. Dyno-bedded parts are ready to race on their first warm up cycle. This can save valuable time and effort when on-track time is either too valuable or not available at all, Dyno-bedding assures that your pads and rotors have been properly run-in and are ready to go. Contact your dealer or the factory for more information on Wilwood Dyno-Bedding services.

NOTE:

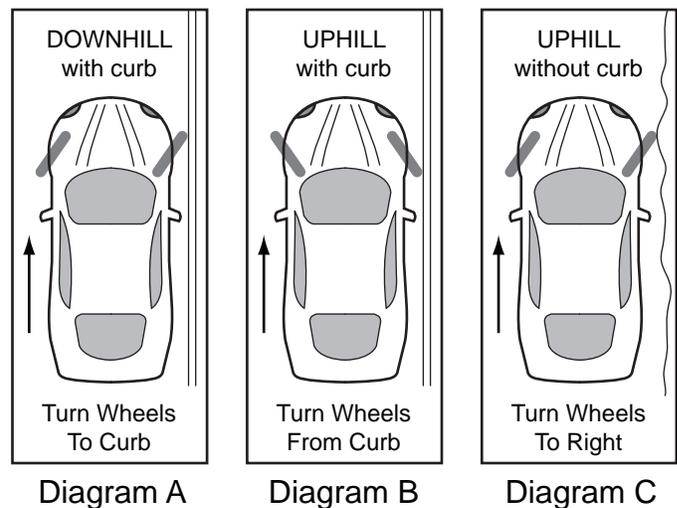
NEVER allow the contact surfaces of the pads or rotors to be contaminated with brake fluid. Always use a catch bottle with a hose to prevent fluid spill during all brake bleeding procedures.

Parking Brake

WARNING • PARKING BRAKE

- Parking brake must be properly adjusted before use and must be manually readjusted for wear if parking brake handle or foot lever travel becomes excessive.
- The holding ability of the brake should be tested by stopping on a sloping surface and applying the parking brake while holding car with the hydraulic foot brake. This should be accomplished both facing up and down hill.
- Do not rely exclusively on the parking brake to hold the car; Curb wheels as recommended by the applicable diagram and put gear selector in park, or shift into first gear or reverse with a manual transmission.

- Diagram A - When parking facing downhill, turn front wheels towards the curb or right shoulder. This will keep from rolling into traffic if the brakes become disengaged.
- Diagram B - Turn the steering wheel to the left so the wheels are turned towards the road if you are facing uphill with a curb. The tires will catch the curb if the car rolls backward.
- Diagram C - When facing uphill without a curb, turn the wheels sharply to the right. If the vehicle rolls, it will go off the road rather than into traffic.
- When parking on a hill, always set the parking brake and move the gear selector into park, or shift into first or reverse gear if your vehicle has a manual transmission.



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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)
260-2220	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)
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)
220-0149	Fitting, Straight (1/8-27 NPT to -4)
220-0842	Fitting, 90° Elbow (1/8-27 NPT to -4)

(Consult the Wilwood Catalog for a complete parts list)