

ASSEMBLY INSTRUCTIONS

FOR

BIG BEARING FORD, NEW STYLE*

*For additional vehicle compatibility, visit www.wilwood.com

DYNAPRO DYNAMIC MOUNT DRAG RACE REAR AXLE KIT DUAL CALIPER, 11.25" DIAMETER DRILLED ROTOR (2.50 OFFSET)

BASE PART NUMBER

140-14130

**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.

THIS DUAL CALIPER KIT CAN DRAMATICALLY INCREASE THE STOPPING PERFORMANCE OF YOUR RACE CAR. MAKE SEVERAL LOW SPEED TEST STOPS IN **NON-RACE CONDITIONS**, GRADUALLY INCREASING YOUR SPEED UNTIL YOU FAMILIARIZE YOURSELF WITH YOUR CAR'S NEW STOPPING CHARACTERISTICS.



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

DISC BRAKES
wilwood

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.
- Verify the rear axle housing flange pattern, axle offset, and other critical measurements as outlined on page 3.
- This brake kit does not include flex lines. OEM brake lines will not adapt to Wilwood calipers. Check the assembly instructions, or associated components section for brake line recommendations before assembly. In addition, Wilwood offers an extensive listing of brake lines and fittings on our web site: www.wilwood.com.
- 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.

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

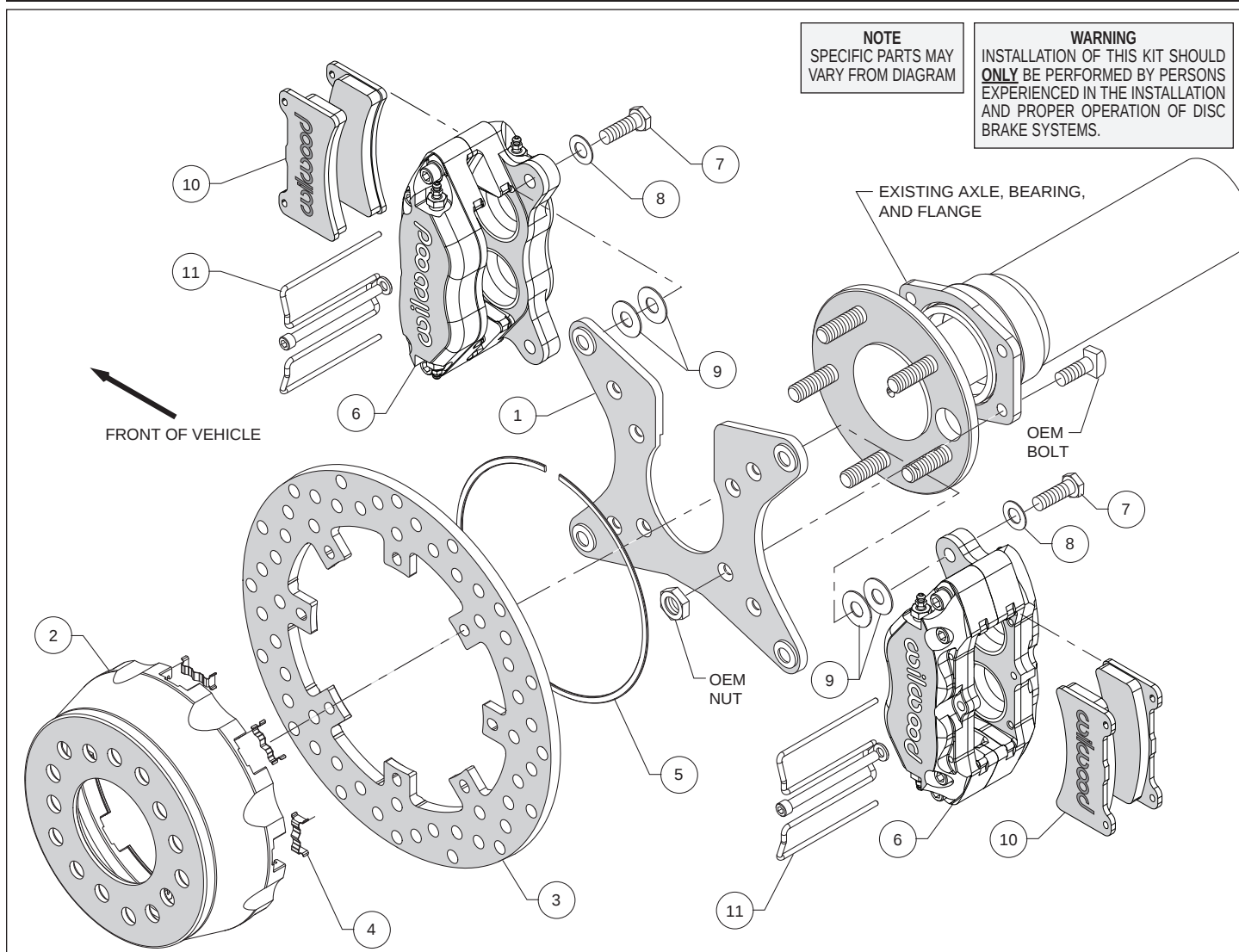


Figure 1. Typical Installation Configuration

Parts List

ITEM NO.	PART NO.	DESCRIPTION	QTY
1	250-14133	Bracket, Caliper Mounting	2
2	170-12544	Hat, Rotor Mounting, 1.635 Offset	2
3	160-14155	Rotor, .35" Thk x 11.25" Dia, 8 x 7.00" Bolt Circle	2
4	300-11931	Dynamic Mount Wear Plate	16
5	310-11775	Snap Ring	2
6	120-14182-N	Caliper, DynaPro Lug Mount	4
7	230-0228	Bolt, 3/8-24 x 1.25 Long, Hex Head	8
8	240-10190	Washer, .391 I.D. x .625 O.D. x .063 Thick.	8
9	240-1159	Shim, .035 Thick	32
10	150-14345K	Pads, CM Compound, Axle Set	2
11	300-9634	Retainer, Pad Clip	4

NOTES: Part Number 300-12561 Dynamic Mount Snap Ring Kit, includes part numbers 300-11931 and 310-11775
 Part Number 230-0204 Caliper Mounting Bolt Kit, includes part numbers 230-0228, 240-10190 and 240-1159

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 disc brake kit, double check the following items to ensure a trouble-free installation.

- Make sure this is the correct kit to match the axle housing flange, not necessarily the rear end make. Many times aftermarket manufacturers put a different make of 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 wheel clearance using Figure 2.
- 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 (see Figure 6).
 - Housing flange mounting pattern to pattern in new bracket (see Figure 6).
 - Stud pattern on axle flange to hole pattern in new hat.
 - Offset dimension from wheel side of axle flange to wheel side of 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 on the cover page.
 - Verify that the wheel axle stud size is 0.50" diameter. The Wilwood hats in this kit are drilled for 0.50" diameter wheel studs.
 - Maximum axle flange diameter must be no larger than 6.29" with a .050" x 45° chamfer (see Figure 3).

Disassembly Instructions:

- Disassemble the original equipment rear brakes:
 - Raise the rear wheels off the ground and support the rear suspension according to the vehicle manufacturer's instructions.
 - Remove the rear wheels and completely disassemble the stock brake system down to the bare axle housing. Save the Original Equipment Manufacturer (OEM) housing flange bolts and nuts.
- Remove any nicks or burrs on the housing flange and axle flange that may interfere with the installation of the new brake components.

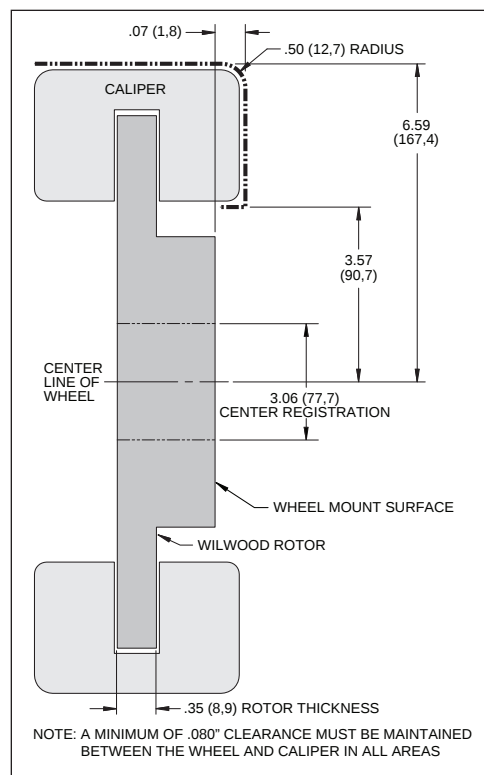


Figure 2. Wheel Clearance Diagram

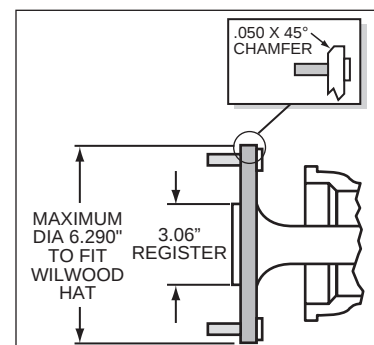


Figure 3. Axle Flange Maximum Dimension

Disassembly (Continued) and Assembly Instructions

Remove the stock bearing retainers from the axles.

- Clean and de-grease the housing flange, axle flange, and saved components.

Assembly Instructions (numbers in parenthesis refer to the parts list and Figure 1 on the preceding pages): **CAUTION:** All mounting bolts must fully engage clinch nuts. Be sure to check that all bolts are either flush or protruding through flanged side of clinch nut after shimming, Figure 5.

- Reinstall the axle into the axle housing.

- Install the caliper mounting bracket (1), with the slot for the axle pointing upward, to the housing flange using the OEM bolts and nuts, as shown in Figure 1 and Photo 1. Ensure that the caliper mounting ears on the bracket are oriented fore and aft on the car, with the heads of the clinch nuts facing outboard, Photo 1. Apply red *Loctite*® 271 to the OEM bolt threads and torque to OEM specifications.

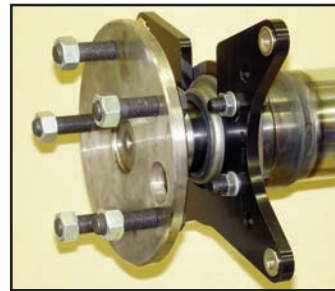


Photo 1

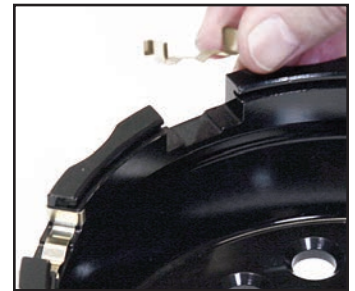


Photo 2

- Insert the dynamic mount wear clips (4) into the slots in the hat (2) making sure the tabs snap in place, Photo 2. Orient the rotor (3) as shown in Figure 1 and Photo 3, with the flush mount tab side facing the hat. Attach the rotor to the hat using snap ring (5) by pushing down on the rotor and installing the ring into the groove in the hat, as shown in Photo 4. Ensure that the ring is fully engaged in the groove.



Photo 3

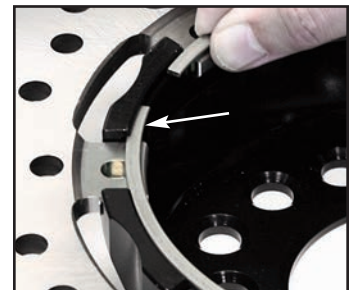


Photo 4

- Align the correct hole pattern in the hat with the axle stud pattern and slide the hat/rotor assembly onto the axle hub. **NOTE:** The hat must fit flush against the axle flange or excessive rotor run out may result. Install three lug nuts (finger tight) to keep the hat/rotor in place while continuing with the installation. **NOTE:** Some OEM and aftermarket axles come with stud sizes larger than 0.50" diameter. Verify stud size, and if necessary, have a qualified machine shop drill the hats to the correct size.

- NOTE:** Please reference the caution statement at the beginning of the assembly instructions. Mount one caliper (6) onto the mounting bracket (1) using bolts (7) and washers (8), as shown in Figure 1. Initially place two .035" thick shims (9) on each bolt between the caliper and the bracket, Photo 5. Temporarily tighten the mounting bolts and view the rotor (3) through the top opening of the caliper. The rotor should be centered in the caliper, Photo 6. If not, adjust the caliper by adding or subtracting shims between the bracket and the caliper. Always use the same amount of shims on each of the two mounting bolts. **NOTE:** The end of each bolt must be flush with or slightly protruding from the head of the clinch nut. If necessary, place spare shims between washer and caliper mounting ear to achieve the proper clinch nut engagement, as shown in Figure 5. Once the caliper alignment and clinch nut engagement are correct, remove the bolts one at a time, apply red *Loctite*® 271 to the threads, and torque to 40 ft-lb. For an added measure of security, the bolts may be safety wired 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. Repeat this procedure for the second caliper.



Photo 5



Photo 6

Assembly Instructions (Continued)

- Insert the disc brake pads (10) into the caliper, with the friction material facing the rotor, Photo 7. Secure the pads in place using the pad clip retainer (11) as well as the center bridge pad retainer tube, bolt, and locknut, Photo 8. The locknut should be snug without play in the bolt or tube. Be cautious not to over tighten.

- Temporarily install the wheel and torque lug nuts to manufacturer's specification. Ensure that the wheel rotates freely without any interference.

- **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. **Carefully route lines to prevent contact with moving suspension, brake or wheel components.** **NOTE:** 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.

- Bleed the brake system, referring to the additional the information and recommendations on page 7 for proper bleeding instructions. Check system for leaks after bleeding.

- Install the wheel and torque lug nuts to manufacturer's specifications.

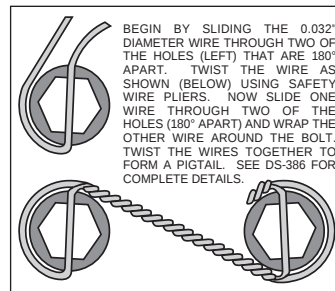


Figure 4. Safety Wire Diagram

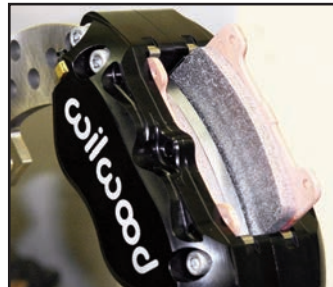


Photo 7

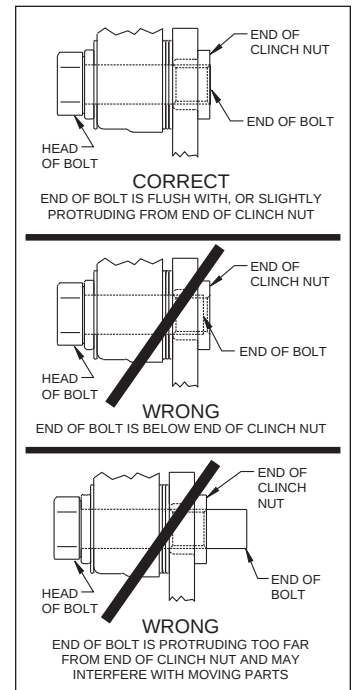


Figure 5. Clinch Nut Engagement Diagram

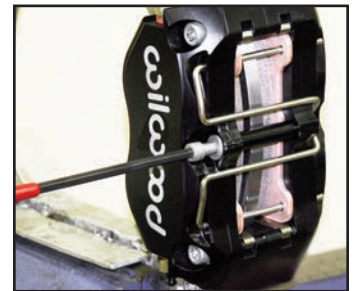


Photo 8

Assembly Instructions (Continued)

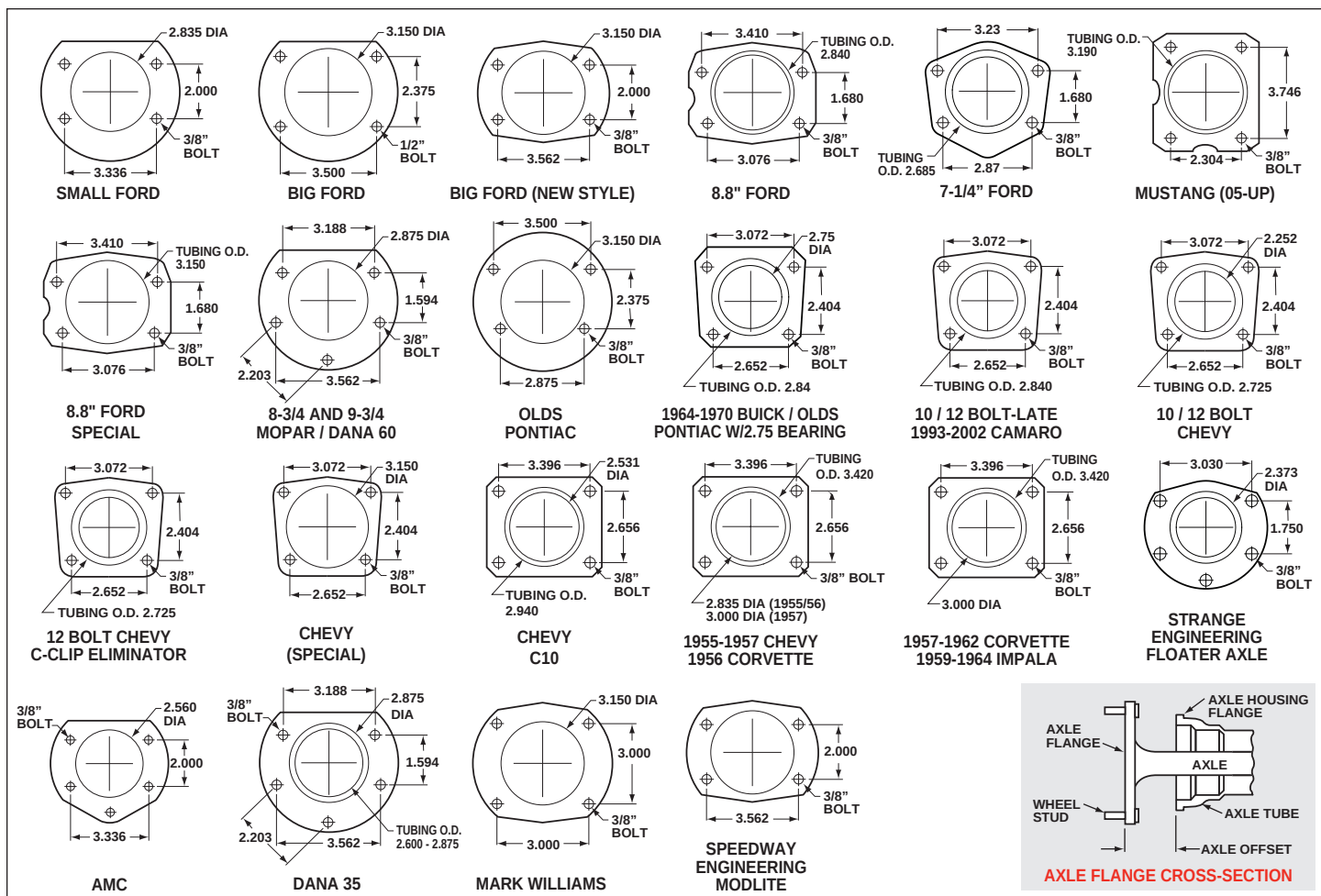


Figure 6. Rear Housing Flange Chart and Axle Flange / Offset Cross-Section

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.*

- 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.

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Associated Components

<u>PART NO.</u>	<u>DESCRIPTION</u>
260-13706	Wilwood Residual Pressure Valve (2 lb for disc brakes)
260-13707	Wilwood Residual Pressure Valve (10 lb for drum brakes)
260-8419	Wilwood Proportioning Valve, Knob Style
260-8420	Wilwood Proportioning Valve, Lever Style
260-11179	Wilwood Combination Proportioning Valve with Brake Light Switch
290-0632	Wilwood Racing Brake Fluid (Hi-Temp° 570) (12 oz)
290-6209	Wilwood Racing Brake Fluid (EXP 600 Plus) (16.9 oz)
340-13831	Wilwood Floor Mount Brake Pedal (with balance bar)
340-13832	Wilwood Swing Mount Brake Pedal (with balance bar)
260-8555	Wilwood 1 inch Aluminum Tandem Chamber Master Cylinder
260-8556	Wilwood 1-1/8 inch Aluminum Tandem Chamber Master Cylinder
150-9418K	BP-20 Street Performance / Racing Brake Pads • Baseline Pad for Track Oriented Street Cars
150-12247K	BP-40 High Temperature Racing Brake Pads • Race Only Pad for Severe Duty Oval, Road Course, or Off-Road
220-7056	Stainless Steel Braided Flexline Kit, Universal, 14 Inch, Domestic, 3/8-24 IF
220-7699	Stainless Steel Braided Flexline Kit, Universal, 16 Inch, Domestic, 3/8-24 IF
220-8307	Stainless Steel Braided Flexline Kit, Universal, 18 Inch, Domestic, 3/8-24 IF
220-8338	Stainless Steel Braided Flexline Kit, Universal, 14 Inch, Metric 10mm x 1.0
220-6856	Stainless Steel Braided Flexline Kit, Universal, 18 Inch, Metric 10mm x 1.0