ASSEMBLY INSTRUCTIONS

FOR

DYNALITE BIG BRAKE FRONT HUB KIT
VENTED ROTOR TYPE

1987 - 1993 FORD MUSTANG (DISC SPINDLE)

(FIVE LUG CONFIGURATION ONLY)*

PART NUMBER GROUP

140-7589-B

WARNING

INSTALLATION OF THIS KIT SHOULD **ONLY** BE PERFORMED BY PERSONS EXPERIENCED IN THE INSTALLATION AND PROPER OPERATION OF DISC BRAKE SYSTEMS. 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.

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!

BEFORE OPERATING VEHICLE, TEST THE BRAKES UNDER CONTROLLED CONDITIONS IN A SAFE AREA. TEST THE SYSTEM IN STATIC CONDITIONS FOR PROPER PEDAL HEIGHT AND THE ABILITY TO HOLD PRESSURE BEFORE ATTEMPTING TO MOVE THE VEHICLE. MAKE SEVERAL STOPS IN A SAFE AREA AT SLOW SPEEDS AND GRADUALLY WORK UP TO NORMAL OPERATING CONDITIONS. **ALWAYS** UTILIZE SAFETY RESTRAINT SYSTEMS AND ALL OTHER REQUIRED SAFETY EQUIPMENT WHILE OPERATING THE VEHICLE.

IMPORTANT

READ THE DISCLAIMER OF WARRANTY INCLUDED IN THE KIT.

WARNING: 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.

*KIT SUPPORTS BOLT PATTERNS 5 X 4.50 AND 5 X 4.75 ONLY

Important Notice - Read This First

NOTE:
Installation of this kit requires spindle modifications that are best accomplished by a qualified machine shop. Please read installation instructions completely before beginning work.

Review the wheel clearance diagram (Figure 1) to verify that your wheels provide adequate clearance for this brake kit.

This kit will result in the wheels being moved out approximately one inch beyond the stock location.

General Information and Parts List

General Information:

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 front disc brake kit, double check the following items to ensure a trouble-free installation. Also, please read these instructions thoroughly to be sure you have a complete understanding of the procedure involved before work is begun.

•Make sure this is the correct kit to match the exact make and model year of the vehicles spindle (i.e., hubs for a 1965 Ford spindle will not fit a 1989 Ford spindle). On this application, the “ears” where the OEM calipers were mounted interfere with the assembly of the Wilwood disc brake kit. These “ears” must be removed; 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. See spindle modification instructions below.

•Verify the hub stud pattern in this kit matches the stud pattern of the vehicles wheels.

•Verify wheel clearance, see figure 1.

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

Parts List:

ITEM NO.	PART NO.	DESCRIPTION	QTY
1	249-4501/02	Bracket Kit, Caliper Mounting (pair, one each, left and right)	1
2	230-3206	Bolt, 3/8-24 x 1.00 Long, FHCS	6
3	230-0921	Stud, 1/2-20 x 3.00 Long, SHCS	10
4	270-7680	Hub Assembly	2
5	370-2609	Cone, Inner Bearing	2
6	380-2572	Seal, Grease	2
7	300-3307	Adapter, Rotor	2
8	160-5839	Rotor, .81” Thick x 10.75” Dia, 6 x 6.25” Bolt Circle	2
8A	160-7097/98	Rotor, Drilled and Slotted (one each, left and right)	2
9	230-2043	Bolt, 5/16-18 x 0.75 Long, Hex Head	12
10	240-2510	Washer, 3/8 inch	10
11	230-3784	Bolt, 3/8-16 x 1.0 Long, Torx	10
12	370-0882	Cone, Outer Bearing	2
13	240-2283	Washer, Spindle, 3/4 inch	2
14	211-1674	O-ring	2
15	270-2158	Cap, Dust	2
16	120-6816	Caliper, Forged Dynalite	2
17	240-0140	Washer, Lock, 3/8 inch	4
18	230-0228	Bolt, 3/8-24 x 1.25 Long, Hex Head	4
19	240-1159	Shim, 0.032 inch Thick	16
20	150-8850K	Pad, BP-10, Axle Set	1
21	180-0055S	Pin, Cotter	2

NOTES:
Part Number 230-3829 Bolt Kit, adapter plate to hub, includes part numbers 230-3784 and 240-2510
Part Number 230-3328 Bolt Kit, rotor to adapter plate, includes part number 230-2043
Part Number 230-0204 Bolt Kit, caliper to bracket, includes part numbers 230-0228, 240-0140 and 240-1159
Part Number 230-4306 Bolt Kit, includes part number 230-3206
Item 8A is an optional item and is included in the (D) kits. Add -D to end of part number when ordering

Disassembly Instructions and Steering Arm / Spindle Modification Diagram

Disassembly Instructions:

•Disassemble the original equipment front brakes:

Raise the front wheels off the ground. Support the front suspension by placing jack stands under the lower control arms. The lower control arms **MUST** be supported. The vehicle's weight must be on jack stands. The vehicle must not supported by a car jack or hoist.

Remove the center cap, cotter pin, nut lock and the wheel bearing nut and washer. Save the wheel bearing nut and nut lock. Remove the brake drum and hub assembly, including the wheel bearings. Disconnect the brake hoses from the brake line at the body. Remove the two upper backing plate retaining nuts and bolts. Remove the two lower ball joint to spindle nuts and bolts. The backing plate, spindle and ball joint will now separate. Remove the brake backing plate and shoes as an assembly. Reinstall the front ball joint bolt and nut. Do not tighten at this time. Do not reinstall the rear bolt and nut.

•Clean and de-grease the spindles. Remove all nicks or burrs on the spindle snout and threads. Remove any of the backing plate gasket which may remain on the spindles. Remove any scale or rust from the gasket area.

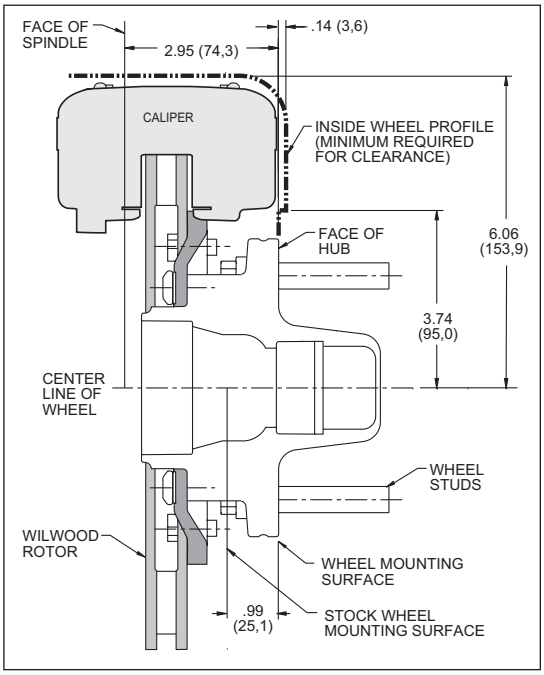

Figure 1. Wheel Clearance Diagram

Steering Arm / Spindle Modification Diagram:

These modifications (described in detail on page 4) should be performed by a qualified machinist. Refer to Figure 2 (below) as necessary. Only one view of the steering arm/spindle is shown, but the modifications need to be performed on both steering arm/spindles.

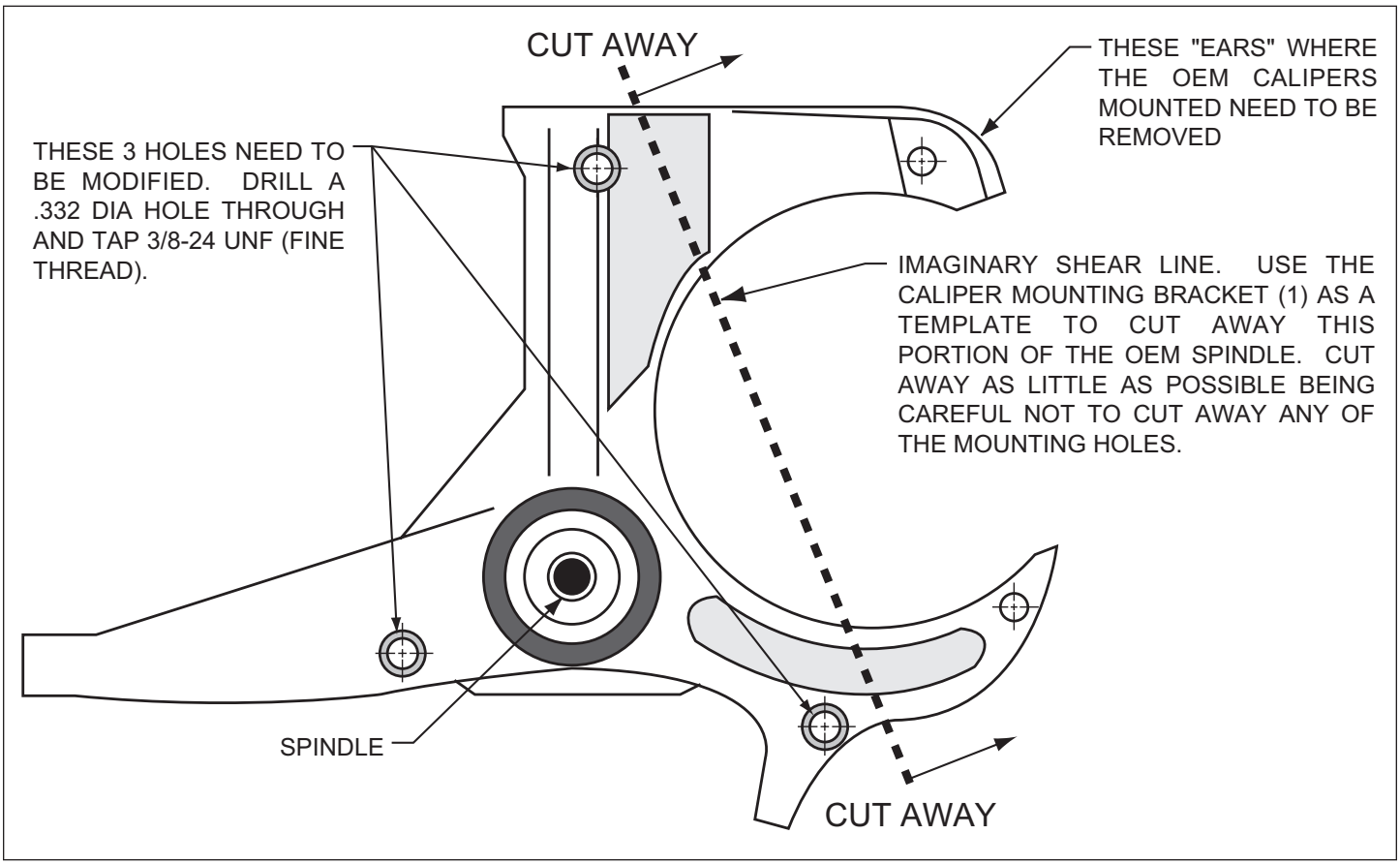

Figure 2. Typical Steering Arm / Spindle Modifications

Steering Arm / Spindle Modification Procedure

Steering Arm / Spindle Modification Procedure:

•With the spindle positioned in its correct upright position with the snout pointing towards you, measure 2.875 inches from the spindle centerline to lower OEM caliper mounting ear, mark this point. Remove OEM caliper mounting ear from this mark, be careful not to cut into the dust plate mounting hole and raised boss. Remove all sharp corners and burrs with a file or grinder.

•Remove only the upper OEM caliper mounting ear making sure all the material required to mount the front strut is still intact. Remove all sharp corners and burrs with a file or grinder.

•Drill out the three dust plate mounting holes in the spindle face with a 5/16 inch (.312) diameter drill. Tap the three holes with a 3/8-24 UNC tap (these three holes will be used to mount the caliper mounting bracket). Verify that there are no raised burrs on the spindle face that may interfere with the assembly of the disc brake kit components.

Exploded Assembly Diagram

Exploded Assembly Diagram:

(Numbers in parenthesis refer to the parts list on page 2)

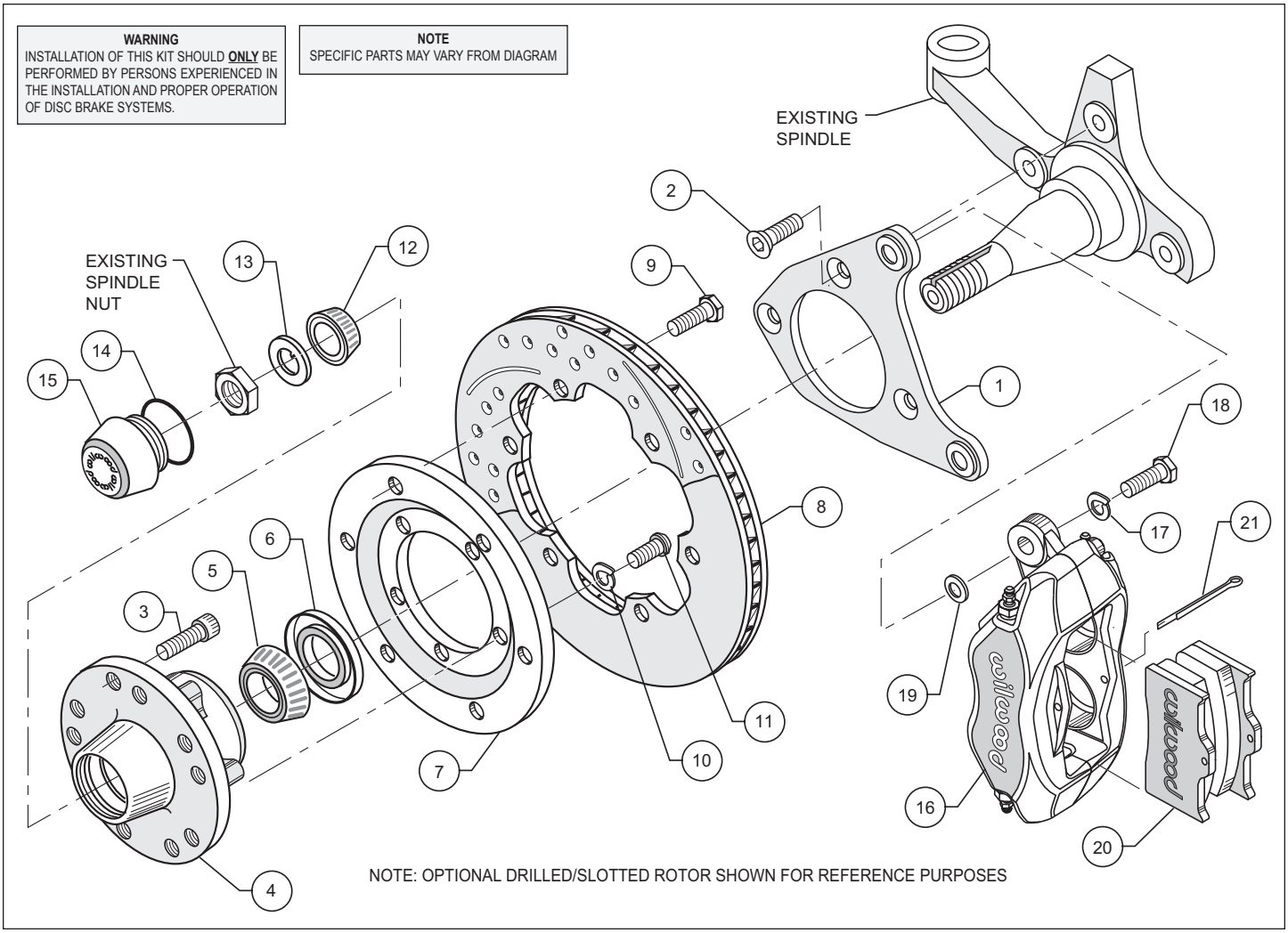

Figure 3. Typical Installation Configuration

Assembly Instructions

Assembly Instructions (numbers in parenthesis refer to the part list/diagram on pages 2 and 4): **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.

•Install bolts (2) through caliper mounting bracket (1) into steering arm, finger tighten only. After you are positive of the bracket (1) alignment, remove the mounting bolts (2) one at a time and Apply red *Loctite*® 271 to bolt threads, then reinstall. Torque bolts (2) to 30 ft-lb. **NOTE**: Be sure the heads of the bracket (1) insert nuts are facing outward toward the wheel.

•Install wheel studs (3) into the hub (4). Torque to 77 ft-lb. **NOTE:** There are two (2) five lug patterns in the hub (5 x 4.50 and 5 x 4.75). Make sure of the correct hole pattern for the correct wheel application before installing studs into hub.

•Pack the large inner bearing cone (5) with high temperature disc brake bearing grease (available from your local auto parts store) and install into the backside of the hub (4). Install the grease seal (6) by pressing into the backside of the hub (4).

•Attach rotor adapter plate (7) to rotor (8) using bolts (9). Torque bolts (9) to 180 **in-lb**. Safety wire bolts (9) 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.org/ds386.pdf) for complete safety wire installation instructions. **NOTE**: Dished side of adapter plate (7) should face hub (4). The machined tab side of the iron rotor (8) should face the adapter plate (7).

•Mount the adapter/rotor assembly (7 and 8) to the hub (4) using lock washers (10) and bolts (11). Torque bolts (11) to 22 ft-lb. Safety wire bolts (11).

•Pack the small outer bearing cone (12) with high temperature disc brake bearing grease and install into front of hub (4). Slide the hub/rotor assembly (4 and 8) with outer bearing cone (12) onto the spindle. Secure using stock spindle washer, adjusting nut and nut locking device. Adjust bearings per Original Equipment Manufacturer (OEM) specifications.

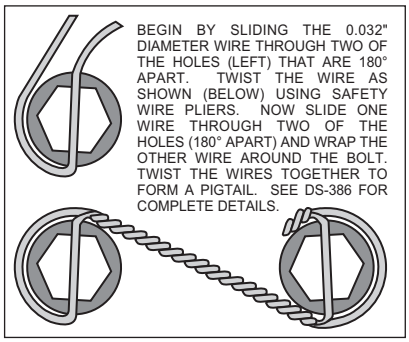

Figure 4. Safety Wire Diagram

•Install the o-ring (14) and the dust cap (15) into the hub (4). Friction created by the o-ring (14) on the dust cap (15) keeps it from unscrewing. The O.D. of the existing spindle washer may be larger than the I.D. of the dust cap (15) which may allow the washer to contact the dust cap (15). Use the spindle washer (13) supplied with the kit instead of the stock washer..

•**NOTE:** Please reference the caution statement at the beginning of the assembly instructions. With the bleed screws pointing up, mount the caliper (16) onto the caliper bracket (1) using lock washers (17) and bolts (18), finger tighten only. View the rotor (8) through the top opening of the caliper (16). The rotor (8) should be aligned in the center of the caliper (16). If not, adjust the caliper (16) by using 0.032 inch thick shims (19) placed between the caliper mounting bracket (1) and the caliper (16). Finger tighten and recheck alignment. Use as many shim washers (19) as necessary to achieve the correct alignment. Apply red *Loctite*® 271 to bolt threads (18) and torque to 30 ft-lb. Safety wire caliper bolts (18).

•Install the disc brake pads (20) and secure using cotter pin (21).

•**NOTE:** OEM rubber brake hoses will not adapt to Wilwood calipers and should not be used. The caliper inlet fitting is a 1/8-27 NPT. 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 not allow contact with moving suspension. brake or wheel components.** Periodically check hose and components for irregular wear. Wilwood brake and 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. Wilwood offers an optional braided stainless steel flex line designed specifically for this kit, please order P/N 220-6471.

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

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.

•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.

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)
220-0149	Fitting, Straight (1/8-27 NPT to -4)
220-0842	Fitting, 90° Elbow (1/8-27 NPT to -4)
220-6471	Stainless Steel Braided Flex Line Kit

Bolt Torque Specifications

BOLT SIZE	TORQUE
1/4-20	85 **in-lb**
1/4-28	103 **in-lb**
5/16-18	180 **in-lb**
5/16-24	198 **in-lb**
3/8-16	22 ft-lb
3/8-24	30 ft-lb
7/16-14	42 ft-lb
7/16-20	47 ft-lb
1/2-13	65 ft-lb
1/2-20	77 ft-lb
9/16-12	95 ft-lb
9/16-18	105 ft-lb
5/8-11	110 ft-lb
5/8-18	120 ft-lb

NOTE:
This bolt torque specification list is for use with specific grades of bolts as supplied in the particular Wilwood kit and is not intended as a guide for any other application.