

ASSEMBLY INSTRUCTIONS
FOR
DYNAPRO 6 FRONT HAT KIT
WITH 12.88" DIAMETER VENTED ROTOR

FACTORY FIVE ROADSTER/CHALLENGE WITH SN95 SPINDLE

PART NUMBER GROUP

140-12048

**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.
- Front brake kits do 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.

Exploded Assembly Diagram

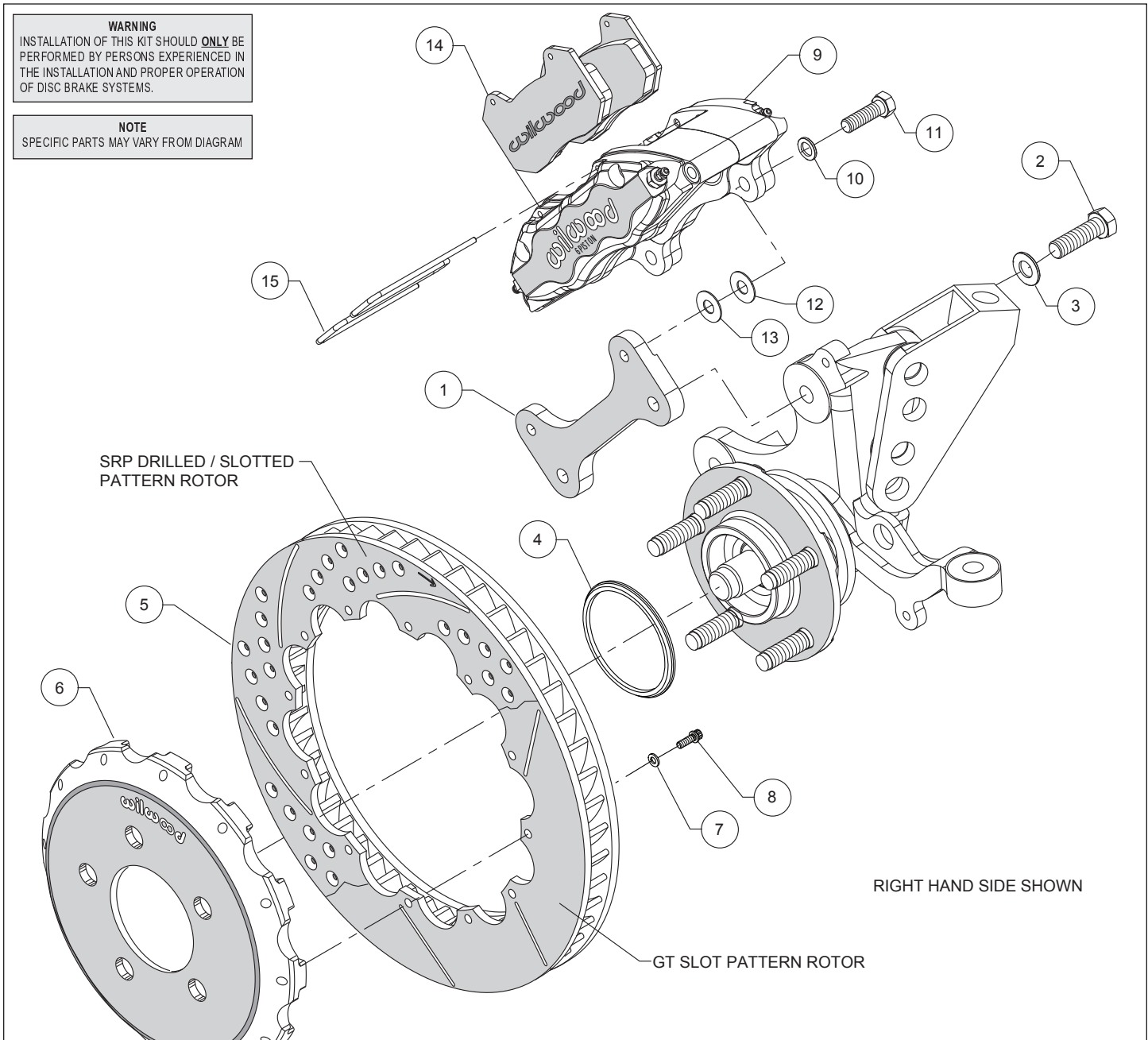


Figure 1. Typical Installation Configuration

Parts List

ITEM NO.	PART NO.	DESCRIPTION	QTY
1	250-12051	Bracket, Caliper Mounting (pair, one each, left and right)	2
2	230-10646	Bolt, M12 x 1.75 x 40mm Long, Hex Head	4
3	240-0476	Washer, .477 I.D. x .922 O.D. x .063 Thick	4
4	300-11337	Adapter, Rotor Registration	2
5	160-7597/98	Rotor, 1.00" Thk x 12.88" Dia, 12 x 8.75" Bolt Circle (right and left)	2
5A	160-8006/07-BK	Rotor, Drilled and Slotted (pair, one each, right and left)	2
6	170-12050	Hat, 5 x 4.25, .700 Offset, 12 x 8.75 Bolt Circle	2
7	240-11240	Washer, .265 I.D. x .500 O.D. x .063 Thick	24
8	230-8037	Bolt, 1/4-20 x .75 Long, 12 Point	24
9	120-10126/27	Caliper, DynaPro 6, (pair, one each, right and left)	2
9A	120-10126/27-RD	Caliper, DynaPro 6, Red (pair, one each, right and left)	2
10	240-10190	Washer, .391 I.D. x .625 O.D. x .063 Thick	4
11	230-10195	Bolt, 3/8-16 x 1.25 Long, Hex Head	4
12	240-10306	Shim, .016 Thick	4
13	240-1159	Shim, .035 Thick	12
14	150-10006K	Pad, BP-10, Axle Set	1
15	300-7316	Pad Clip Retainer	2
16	220-12092	Flex Line Hose Kit (not shown)	1

NOTES: Part Number 230-12056 Bolt Kit, bracket to spindle, includes part numbers 230-10646 and 240-0476
 Part Number 230-8008 Bolt Kit, hat to rotor, includes part numbers 230-8037 and 240-11240
 Part Number 230-10216 Bolt Kit, caliper to bracket, includes part numbers 230-10195, 240-10190, 240-10306 & 240-1159
 Item 5A is an optional item and is included in the "-D" drilled kits. Add "-D" to end of part number when ordering.
 Item 9A is an optional item and is included in the "-R" red kits. Add "-R" to end of part number when ordering.

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 this Wilwood front disc brake kit, double check the following to ensure a trouble free installation.
- Inspect the contents of this kit against the parts list to ensure that all components and hardware are included.
- Make sure this is the correct kit to fit the exact make and model year of your vehicle. This kit is designed for direct bolt-on installation to Factory Five Roadster/Challenge with SN95 spindle (will not fit "Fox" body 1987-93 spindles).
- Verify your wheel clearance using Figure 2.
- Verify that the factory axle hub center register diameter and lug pattern match those in the new registration ring and hat. **NOTE:** Axle hubs that have been modified with different size studs or lug patterns may require modifications to the new hat that must be performed by a qualified machinist.

Disassembly

- Disassemble the original equipment front brakes:
 - Raise the front wheels off the ground and support the front suspension according to the vehicle manufacturer's instructions.
 - Remove the front wheels, calipers and rotors.
- Remove any nicks or burrs on the axle hub and upright that may interfere with the installation of the new brake components.
- Clean and de-grease the axle hub, and caliper mounting bosses.

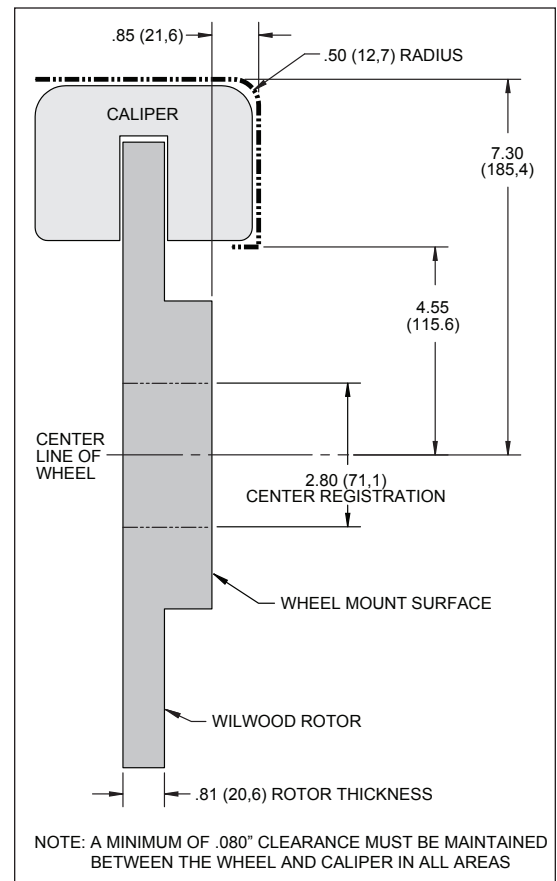


Figure 2. Wheel Clearance Diagram

Assembly Instructions

Assembly Instructions (numbers in parenthesis refer to the parts list and Figure 1 on the preceding pages):

- Orient the caliper mount bracket (1) as shown in Figure 1 and Photo 1, and install using bolts (2) and washers (3). Temporarily tighten the mounting bolts. **NOTE:** *The bracket must fit squarely against the mount bosses on the upright.* Inspect for interference from casting irregularities, machining ridges, burrs, etc. Remove bolts one at a time, apply red *Loctite*® 271 to the threads and torque to 60 ft-lb.

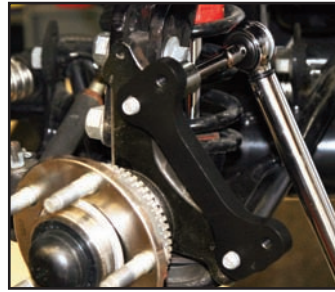


Photo 1



Photo 2

- Orient the rotor (5) and the hat (6) as shown in Figure 1 and Photo 2. Attach rotor to hat using bolts (8) and washers (7). Using an alternating sequence, apply red *Loctite*® 271 to the threads, and torque to 155 **in-lbs**. Safety wire bolts 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/DataSheets/ds386.pdf) for complete safety wire installation instructions.

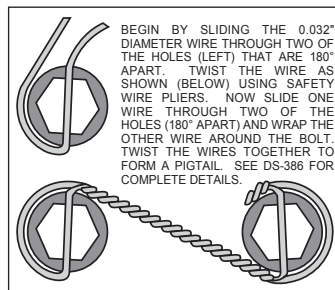


Figure 3. Safety Wire Diagram

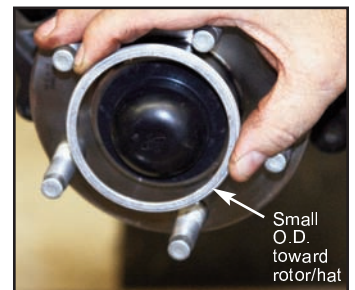


Photo 3

- Slide the rotor registration adapter (4) onto the axle register on the axle hub with the smaller O.D. facing toward the rotor/hat (5/6), Photo 3. Slide the hat/rotor assembly onto the axle hub, Photo 4. **NOTE:** *The hat must fit flush against the axle hub flange or excessive rotor run out may result.* Install three lug nuts (finger tight) to keep the hat/rotor assembly in place while continuing with the installation.



Photo 4

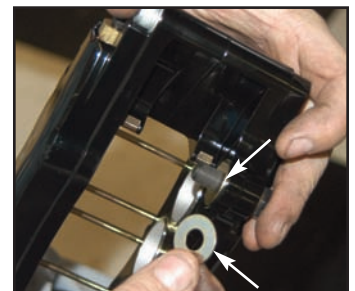


Photo 5

- **NOTE:** *This kit contains distinct right and left hand calipers that must be mounted in a specific direction, as described below.* Mount the caliper (9) onto the caliper mounting bracket (1) using bolts (11) and washers (10), as shown in Figure 1. Initially place one each .016" thick shim (12) and .035" thick shim (13) on each bolt between the caliper and the bracket, Figure 1 and Photo 5. Ensure that the caliper is mounted so the largest pistons are at the rotor exit end of the caliper, in relation to the direction of rotor rotation. Temporarily tighten the mounting bolts and view the rotor (5) through the top opening of the caliper. The rotor should be centered in the caliper, Photo 6. If not, adjust by adding or subtracting shims (12 and/or 13) between the bracket and the caliper. Always use the same amount of shims on each of the two mounting bolts. Once the caliper alignment is correct, remove the bolts one at a time, apply red *Loctite*® 271 to bolt threads, and torque to 35 ft-lb.

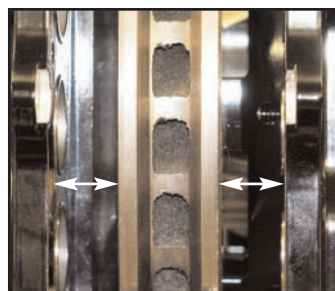


Photo 6

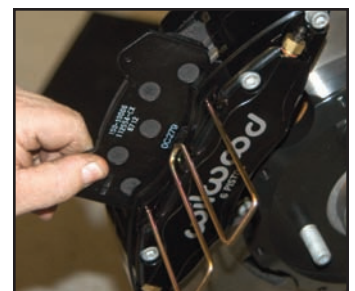


Photo 7

- Install the disc brake pads (14) into the caliper, with the friction material facing the rotor (5), and secure in place using the pad clip retainer (15), Photo 7.

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

Assembly Instructions (Continued)

• **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 hoses 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. Wilwood includes a brake flex line hose kit with this brake kit, P/N 220-12092. Hose kits include hoses, fitting, etc., all in one package for this application.

• **NOTE:** 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 information and recommendations on page 6 for proper bleeding instructions. Check system for leaks after bleeding.

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

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 in-line 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 - 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 flow back 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 flow back 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

<u>PART NO.</u>	<u>DESCRIPTION</u>
290-0632	Wilwood Racing Brake Fluid (Hi-Temp° 570) (12 oz)
290-6209	Wilwood Racing Brake Fluid (EXP 600 Plus) (16.9 oz)
340-11295	Wilwood Pedal Assembly, Forward Mount, Adjustable, Triple M/C
340-11299	Wilwood Pedal Assembly, Rear Mount, Adjustable, Triple M/C
260-6089	Master Cylinder, .750" Bore, Girling Style
260-10500	Master Cylinder Reservoir Kit, Remote
260-3374	Master Cylinder, .750" Bore with Remote Reservoir
220-12092	Factory Five Roadster/Challenge Flexline Kit, Front