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ASSEMBLY INSTRUCTIONS

FOR

1976-1977 FORD BRONCO, DANA 44 DISC SPINDLE*
(WILL NOT WORK WITH GM DISC BRAKE/SPINDLE COMPONENTS)

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

**D8-4 FRONT BRAKE KIT WITH 12.19" DIAMETER
VENTED ROTOR AND FLEXLINES**

BASE PART NUMBER

140-13928

**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.



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DISC BRAKES

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 3, page 3) to verify that there is adequate clearance with the wheels you will be using with the installation.
- 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

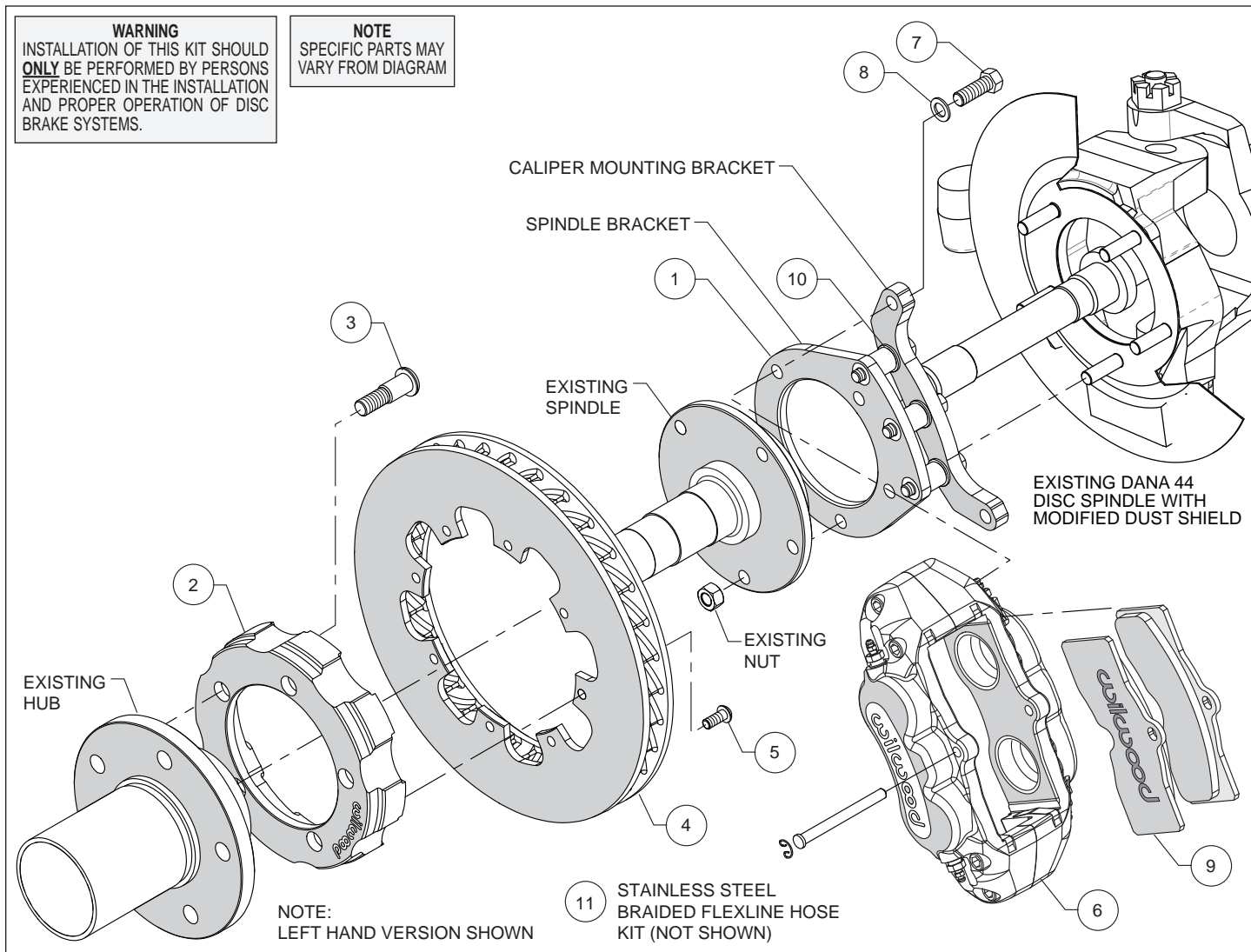


Figure 1. Typical Installation Configuration

Modifications

Modifications

- The front dust shield must be modified (cut), as shown by the black dotted line in Figure 2, to clear the new Wilwood rotor. **NOTE:** It is recommended that the dust shield be removed before modification, and the modification be performed by a qualified machine shop.

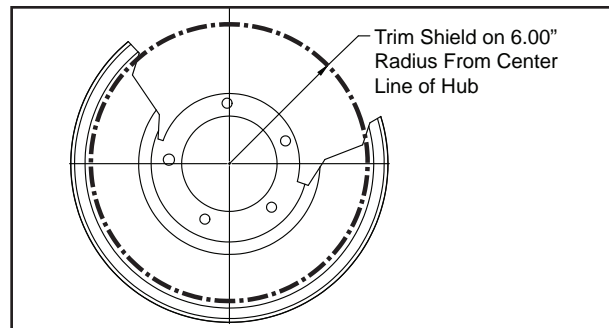


Figure 2. Dust Shield Modification

Parts List

ITEM NO.	PART NO.	DESCRIPTION	QTY
1	249-13929/30	Bracket, Caliper Mounting	1
2	170-13313	Hat / Big Brake, 5 x 5.50, 1.450 Offset, 8 x 7.00" Bolt Circle	2
3	230-13315	Stud, 1/2-20 x 2.00 Long, Press Fit	10
4	160-2894/95	Rotor, UL - 1.25" x 12.19" Dia, 8 x 7.00" Bolt Circle (one each, right and left)	2
5	230-11934	Bolt, 5/16-18 x .75 Long, Button Head, Torx	16
6	120-10525-BK	Caliper, D8-4, Black	2
6A	120-10525-RD	Caliper, D8-4, Red	2
7	230-9897	Bolt, 7/16-20 x 1.25 Long, Hex Head	4
8	240-11101	Washer, .453 I.D. x .750 O.D. x .063 Thick	4
9	150-D0008K	Pad, ProMatrix, Axle Set	1
10	240-1159	Shim, .035 Thick (included with the bracket kit assembly)	24
11	220-13319	Stainless Steel Braided Flexline Hose Kit (not shown)	1

NOTES: Part Number 230-12120 Rotor Bolt Kit, includes part number 230-11934

Part Number 230-12268 Caliper Mounting Bolt Kit, includes part numbers 230-9897 and 240-11101

Item 6A is an optional item and is included with the "-R" red caliper kits. Add "-R" to end of part number when ordering.

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 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 1976 - 1977 model year Ford Bronco Dana 44 disc spindle.
- Verify your wheel clearance using Figure 3.
- Verify that the factory axle hub center register diameter and lug pattern match those in the new 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.

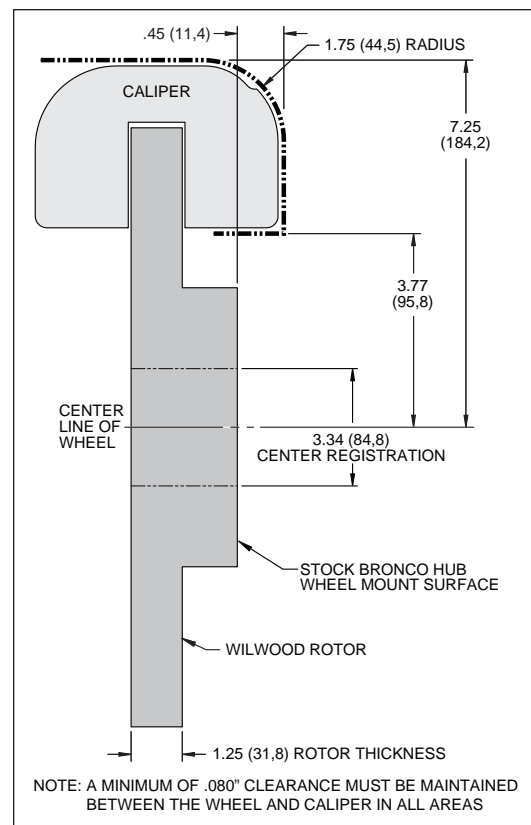


Figure 3. Wheel Clearance Diagram

Disassembly and Assembly Instructions

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 and completely disassemble the stock brake system down to the bare spindle.

The wheel studs will have to be pressed out from the Original Equipment Manufacturer (OEM) hub. NOTE: New wheel studs are supplied with the kit.

- Remove any nicks or burrs on the axle hub and spindle that may interfere with the installation of the new brake components.
- Clean and de-grease the spindle, and bracket mounting surfaces.

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 4.

- The caliper mount bracket (1) has been assembled at the factory for alignment purposes. Orient the bracket as shown in Figure 1 and Photo 1, and install onto the knuckle. Install the OEM spindle over the bracket and secure with OEM nuts, Photo 2. Temporarily tighten the mounting nuts. **NOTE: The bracket must fit squarely against the knuckle.** Inspect for interference from casting irregularities, machining ridges, burrs, etc. Remove nuts one at a time, apply red *Loctite*® 271 to the threads and torque nuts to OEM specification.



Photo 1



Photo 2

- Orient the hat (2) and the OEM hub as shown in Figure 1 and Photo 3. **NOTE: The hat must fit flush against the hub or excessive rotor run out may result.** Press fit the wheel studs (3) thru the holes in the hat and into the existing hub. **NOTE: We recommend this procedure be performed by a qualified machinist.**



Photo 3



Photo 4

- Orient the rotor (4) and the hat/hub assembly as shown in Figure 1 and Photo 4. Attach rotor to hat using bolts (5). Using an alternating sequence, apply red *Loctite*® 271 to the threads, and torque to 25 ft-lbs.

- Install the hat/rotor/hub assembly onto the spindle using OEM components assembled in the reverse order as disassembly and adjust bearings per OEM specifications.

- NOTE: Please reference the caution statement at the beginning of the assembly instructions.** Mount the caliper (6) onto the caliper mounting bracket (1) using bolts (7) and washers (8), as shown in Figure 1. Temporarily tighten the mounting bolts and view the rotor (4) through the top opening of the caliper. The rotor should be centered in the caliper, Photo 5. If not, adjust by adding or subtracting shims (10) between the spindle bracket (1) and caliper mounting bracket, Figure 1. Always use the same amount of shims on each of the three mounting bolts. **NOTE: The end of each bolt must be flush with or protruding from the head of the clinch nut.** Once the caliper alignment and clinch nut engagement are correct, remove the bracket-to-bracket bolts one at a time, apply red *Loctite*® 271 to bolt threads, and torque to 40 ft-lb. Then remove the caliper mount bolts one at a time, apply red *Loctite*® 271 to threads, and torque to 60 ft-lb.

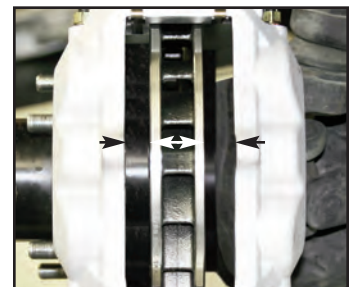


Photo 5

- Remove the pad retaining pin from the caliper (6) by carefully popping out the pin retaining clip and sliding out the pin. Insert the brake pads (9) into the caliper, with the friction material facing the rotor, as shown in Photo 6. Secure the brake pads in place with the pad retaining pin and clip, Photo 7.

Assembly Instructions (Continued)

- Temporarily install the wheel and torque the lug nuts to the 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. Install Wilwood's stainless steel braided flexline hose kit (11), P/N 220-13319 included with this kit. **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.

• **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 bolts to manufacturer's specifications.



Photo 6

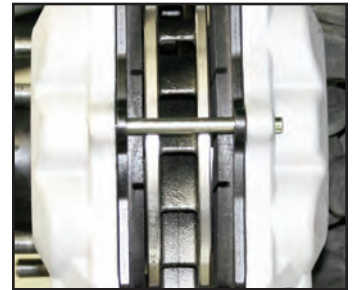


Photo 7

Master Cylinder and Proportioning Valve Recommendations • Manual Brake Systems

The D8-4 caliper kits can easily be configured as a manual brake system using the OE pedal, and eliminating the need for boosters or engines with high manifold vacuum.

- For manual brake systems, installing a 15/16" bore master cylinder is recommended for use with the OE pedal and the D8-4 four piston calipers. Maintaining the factory configuration OE 1.00" bore master cylinder will require increased pedal effort to operate the brake system.
- Use of a Wilwood Tandem outlet manual master cylinder will require using the universal pushrod kit.
- For vehicles converted to four wheel disc brakes, the use of an adjustable proportioning valve is recommended
- For vehicles that will retain rear drum brakes, use of a disc/drum proportioning valve block and a 10 pound inline residual pressure valve is recommended.
- A list of suggested part numbers can be found on page 8 under associated components.

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 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 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

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.

Pad and Rotor Bedding (Continued)

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.

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Associated Components

<u>PART NO.</u>	<u>DESCRIPTION</u>
260-8419	Adjustable Proportioning Valve, Inline Knob Adjust, Disc/Disc
260-11179	Adjustable Combination Proportioning Valve Block, Disc/Disc
260-11322	Proportioning Control Block, Disc/Drum
260-13375	Master Cylinder, 15/16" Bore, Manual, Plain Finish
260-13375-BK	Master Cylinder, 15/16" Bore, Manual, Black Finish
260-13375-P	Master Cylinder, 15/16" Bore, Manual, Polished Finish
260-13707	Residual Pressure Valve, 10# for Drum Rear Brakes, 1/8"-27 NPT -Female
260-13784	Residual Pressure Valve, 10# for Drum Rear Brakes, 3/8"-24 IFF Fittings
261-13626	Master Cylinder Kit with Proportioning Block, 15/16" Bore, Manual, Plain Finish
261-13626-BK	Master Cylinder Kit with Proportioning Block, 15/16" Bore, Manual, Black Finish
261-13626-P	Master Cylinder Kit with Proportioning Block, 15/16" Bore, Manual, Polished Finish
330-13914	Universal Master Cylinder Pushrod Kit
290-0632	Brake Fluid, Hi-Temp 570, 12 oz.
290-6209	Brake Fluid, EXP 600 Plus, 16.9 oz.
290-11084	Brake Fluid, Wilwood FIVE DOT 5 Silicone, 12 oz.