

## ASSEMBLY INSTRUCTIONS

FOR

**1998 - 2002 CAMARO / FIREBIRD\***

**1993 - 1997 CAMARO / FIREBIRD WITH SPINDLE UPDATE**

\*For additional vehicle compatibility, visit [www.wilwood.com](http://www.wilwood.com)

### **SUPERLITE 4R/ST FRONT BRAKE KIT FOR ROAD RACING WITH GT48 13.06" DIAMETER ROTORS**

BASE PART NUMBER

**140-14074**

**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](http://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 - 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.
- 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

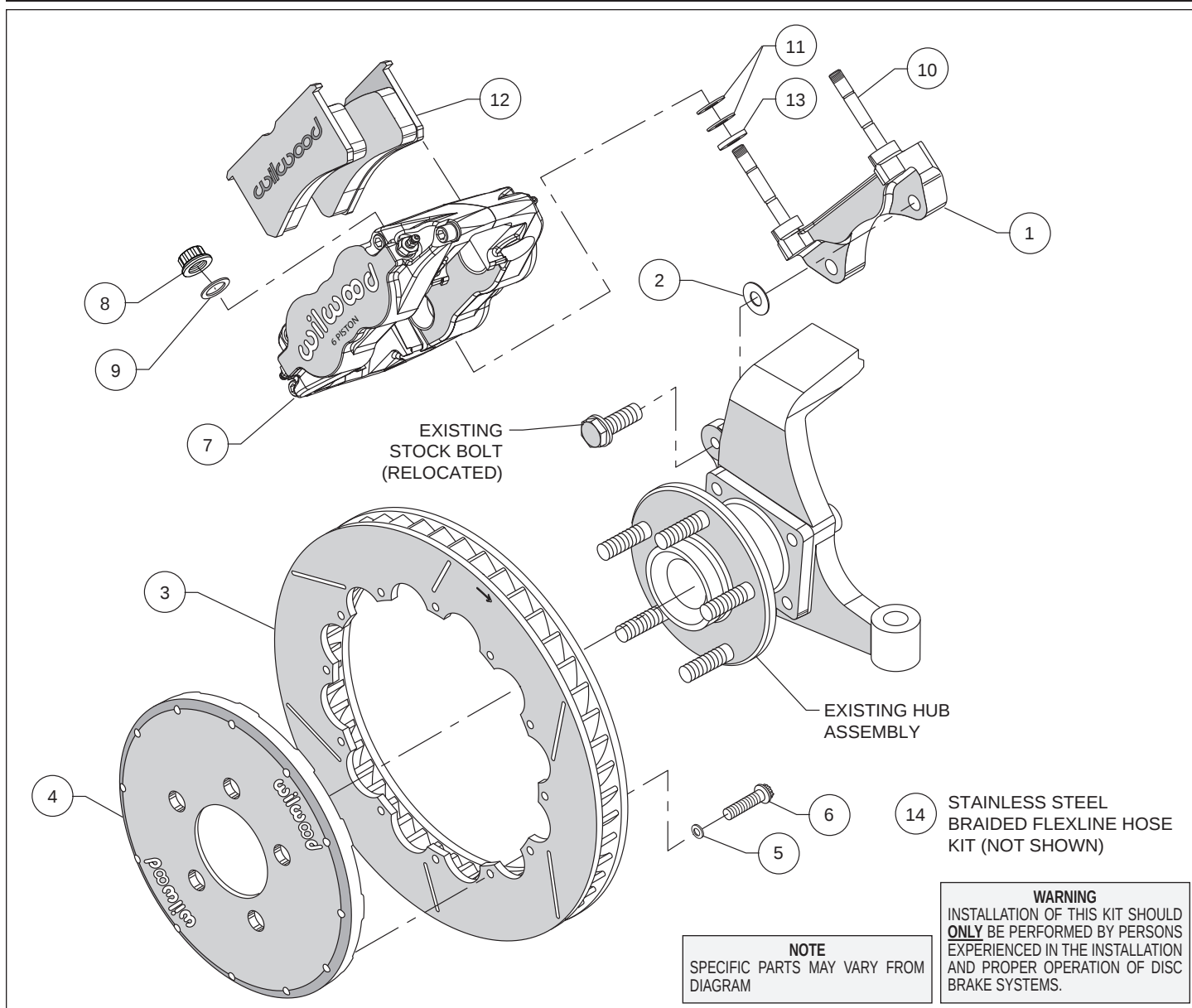


Figure 1. Typical Installation Configuration

## Price List

| ITEM NO. | PART NO.       | DESCRIPTION                                                 | QTY |
|----------|----------------|-------------------------------------------------------------|-----|
| 1        | 250-7690       | Bracket, Caliper Mounting                                   | 2   |
| 2        | 240-6320       | Shim, 0.033 Thick                                           | 16  |
| 3        | 160-8165/66    | Rotor, GT48, 1.25" Thk x 13.06" Dia, 12 x 8.75" Bolt Circle | 2   |
| 4        | 170-6837       | Hat                                                         | 2   |
| 5        | 240-11240      | Washer, .265 I.D. x .500 O.D. x .063 Thick                  | 24  |
| 6        | 230-6737       | Bolt, 1/4-20 x 1.00 Long, 12 Point                          | 24  |
| 7        | 120-13265/66-N | Caliper, Forged Superlite 4R/ST                             | 2   |
| 8        | 230-9183       | Nut, 3/8-24, Self-Locking 12 Point                          | 4   |
| 9        | 240-10190      | Washer, .391 I.D. x .625 O.D. x .063 Thick                  | 4   |
| 10       | 230-9078       | Stud, 3/8-16 x 3/8-24 x 2.5 long (pre installed in bracket) | 4   |
| 11       | 240-1159       | Shim, .035 Thick                                            | 16  |
| 12       | 15H-8114K      | Pad, Polymatrix "H" Compound, Axle Set                      | 1   |
| 13       | 230-10289      | Spacer, .062 Thick                                          | 4   |
| 14       | 220-6746       | Stainless Steel Braided Flexline Hose Kit (not shown)       | 1   |

### NOTES:

Part Number 230-4572 Rotor Bolt Kit, includes part numbers 230-6737 and 240-11240

Part Number 250-7691 Caliper Bracket Mounting Bolt Kit, includes part numbers 230-9183, 230-9078, 240-1159, 240-10190, 240-6320, 240-10289 and 250-7690

## 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.

•Verify the year and model of your spindle. This kit is designed for direct bolt-on installation to 1998 through 2002 model year production spindles that were originally equipped with twin piston calipers. **This kit will not fit 1993 through 1997 production year spindles originally equipped with single piston floating mount calipers.** The correct spindles are identified by casting numbers 18023021 and 18023022. 1993 through 1997 model year vehicles may be updated with the later model spindle to accommodate installation of this kit.

•Verify your wheel clearance using Figure 2.

•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.

•**WARNING:** Brake pads included in this kit are intended for high temperature race use only. Extended use at low temperature can cause accelerated rotor and pad wear. Please see the associated components list on the last page of this data sheet for alternative brake pad compounds for other uses.

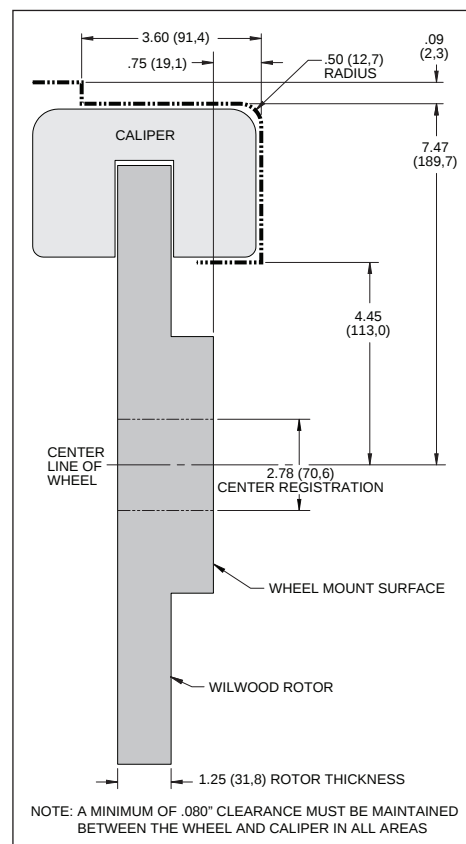


Figure 2. Wheel Clearance Diagram

### 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, rotors, and dust shields. Save the stock caliper mounting bracket bolts, they will be utilized during reassembly.

•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, upright assembly, and saved components.

## Assembly Instructions

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

- The caliper mount bracket (1) should initially be installed with clean, dry threads on the mounting bolts. Orient the bracket as shown in Figure 1, and install using OEM bolts. Initially place one .033 thick shim (2) on each bolt between the bracket and upright, Figure 1. 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. Later, after the caliper alignment has been checked, the mount bolts will be secured using red *Loctite*® 271.



Photo 1

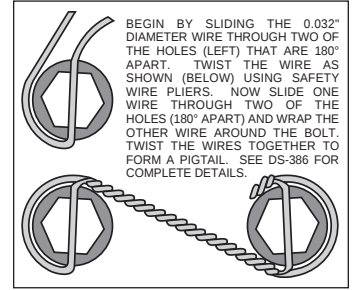


Figure 3. Safety Wire Diagram

- Orient the rotor (3) and the hat (4) as shown in Figure 1 and Photo 1. Attach rotor to hat using bolts (6) and washers (5). Using an alternating sequence, apply red *Loctite*® 271 to the threads, and torque to 155 **in-lbs**. The bolts must be safety wired 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](http://www.wilwood.com/Pdf/DataSheets/ds386.pdf)) for complete safety wire installation instructions.

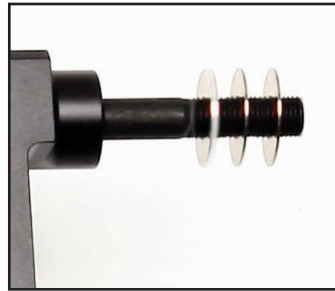


Photo 2

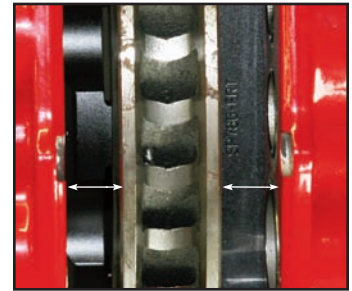


Photo 3

- NOTE:** This kit contains distinct right and left hand calipers that must be mounted in a specific direction, as described below. Lubricate the caliper mounting studs (10) with lightweight oil. Initially place one .062" thick spacer (13) and two .035" thick shims (11) on each stud as shown in Figure 1 and Photo 2. Mount the caliper (7) onto the bracket (1) using lock nuts (8) and washers (9), Figure 1. Ensure that the caliper is mounted so that the largest pistons are at the rotor exit end of the caliper, in relation to the direction of rotor rotation. Temporarily tighten the lock nuts and view the rotor through the top opening of the caliper. The rotor should be centered in the caliper, Photo 3. If not, adjust by adding or subtracting shims (2) between the bracket and the upright. Always use the same amount of shims on each of the two mounting bolts. Once the caliper alignment is correct, remove the bracket mounting bolts one at a time, apply red *Loctite*® 271 to the threads, and torque to 60 ft-lb.



Photo 4

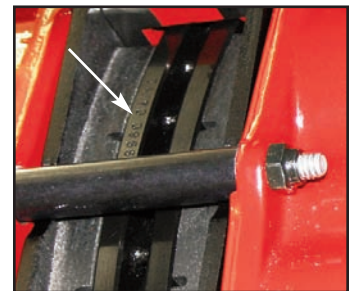


Photo 5

- Remove the caliper center bridge pad retainer bolt, nut, and tube from the caliper. Insert the brake pads (12) into the caliper, with the friction material facing the rotor, as shown in Photo 4. Check that the top of the brake pad is flush with the outside diameter of the rotor, Photo 5. If not, adjust by adding or subtracting shims (11) between the caliper and the bracket. After the caliper pad height is set, reinstall the center bridge pad retainer tube, bolt, and lock nut. The lock nut should be snug without play in the bolt or tube. Be cautious not to over tighten. Torque the caliper lock nuts (8) to 30 ft-lb.
- Temporarily install the wheel and torque the lug nuts to the 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. Install Wilwood's stainless steel braided flexline hose kit (14), P/N 220-6746 included with this kit. The 10mm x 1 to -3 (P/N 220-6890) male fitting installs to the stock bulkhead. Then install the straight 1/8-27 to -3 NPT (P/N 220-6956) fitting into the caliper (7). Finally, install the flexline to the two previously installed fitting. **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.

•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 the lug nuts to manufacturer's specification.

## Additional Information and Recommendations

- Please read the following concerning 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.

NOTES:

1. New master cylinders should be bench bled prior to installation.
2. If the master cylinder fluid reservoirs are mounted lower than the calipers, an in-line 2 lb. residual pressure valve may be necessary to prevent fluid flowback and the subsequent long initial pedal stroke required to actuate the system.

**For all types of pedals and master cylinders:**

- Test the brake pedal. It should be firm and consistent. If not, first try re-bleeding the system. The pedal should stop at least 1" or more from the floor under heavy load. Pedal height must be comfortable to the driver.
- If the pedal is initially firm, but then travels to the floor, check the entire system for leaks. This may also be a sign of a faulty master cylinder.
- If the pedal is constantly spongy, and repeated bleeding does not correct the problem, the master cylinder selection and pedal geometry may need re-evaluated.
- If you are still experiencing difficulty after all instructions have been followed, consult your chassis shop, the retailer where the kit was purchased, or the Wilwood Tech Line.

**Test Driving the Vehicle:**

- Make a series of light stops at low speed to assure proper system operation. Then proceed to the rotor and pad bedding procedure.

**New Rotor Bedding:**

- Make a series of light, then medium, then gradually harder stops to bring the rotors up to near operating temperature. Then use a few cool down laps to allow the rotors to cool. Avoid using the brakes during the cool down. This will act as the final stress relief on the rotors. If possible, allow the rotors to cool completely before competition and subsequent pad bedding. Be cautious to avoid heat shocking the rotors by heating or cooling them too quickly when they are new. It is also a good practice to warm the brakes prior to any competition to avoid thermal shock and potential stress fractures.

**New Pad Bedding:**

- This procedure is similar to the rotor bedding process. Make a series of light, then medium, then gradually harder stops to bring the pads to full operating temperature. Then use a few cool down laps to allow the pads to cool. Avoid using the brakes during the cool down. If possible, allow the brakes to cool completely before participating in competition. This process will properly mate the pads with the rotor surface and act as the final curing step for the friction compound. Following this procedure will assure the best performance and service life from your brakes.

## 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        | Wilwood Proportioning Valve, Knob Style                   |
| 260-8420        | Wilwood Proportioning Valve, Lever Style                  |
| 290-6209        | Wilwood Racing Brake Fluid, EXP 600 Plus (16.9 oz bottle) |
| 290-8478        | Wilwood Racing Brake Fluid, EXP 600 Plus (6 pack)         |
| 15H-8114K       | Pad Set, 7420-H PolyMatrix                                |
| 15H-8114K-B     | Pad Set, 7420-H PolyMatrix, Dyno Bedded                   |
| 15A-5938K       | Pad Set, 7420-A PolyMatrix                                |
| 15A-5938K-B     | Pad Set, 7420-A PolyMatrix, Dyno Bedded                   |
| 150-12245K      | Pad Set, 7420-40, BP-40 Smart Pads                        |
| 150-12245K-B    | Pad Set, 7420-40, BP-40 Smart Pads, Dyno Bedded           |
| 130-5100        | Caliper Piston O-Ring Kit, 4 pack                         |
| 220-9627        | Caliper Bleed Screws, 4 pack                              |
| 300-5923/24     | Caliper Bridge Wear Plate, Right / Left, each             |