

ASSEMBLY INSTRUCTIONS
FOR
DYNALITE DRAG RACE REAR AXLE KIT
WITH 11.44" DIAMETER SOLID ROTOR (2.50 OFFSET)
MOPAR 8-3/4 • DANA 60
FOR USE WITH GREEN⁽¹⁾ NON-ADJUSTABLE BEARINGS
PART NUMBER GROUP
140-8853

**DISC BRAKES SHOULD ONLY BE INSTALLED BY SOMEONE
EXPERIENCED AND COMPETENT IN THE INSTALLATION AND
MAINTENANCE OF DISC BRAKES
READ ALL WARNINGS**



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.

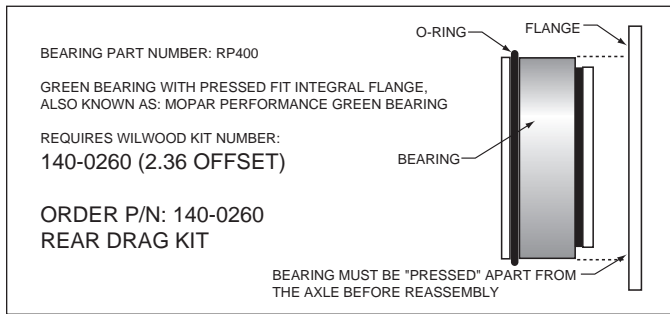


Figure 1. Press Fit Retainer Bearing Configuration

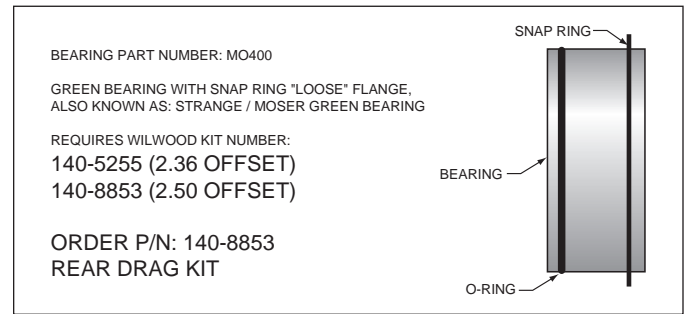


Figure 2. Loose Fit Retainer Bearing Configuration



| <u>ITEM NO.</u> | <u>PART NO.</u> | <u>DESCRIPTION</u> | <u>QTY</u> |
|-----------------|-----------------|---|------------|
| 1 | 249-5253/54 | Brackets, Caliper Mounting (pair, one each, left and right) | 1 |
| 2 | 170-0317 | Hat, Rotor Mounting | 2 |
| 3 | 160-0201 | Rotor, .35" Thk x 11.44" Dia, 8 x 7.00" Bolt Circle | 2 |
| 4 | 180-0054S | Cotter Pin | 2 |
| 5 | 230-2043 | Bolt, 5/16-18 x 0.75 Long, Hex Head | 16 |
| 6 | 120-6818 | Caliper, Forged Dynalite | 2 |
| 7 | 240-10190 | Washer, .391 I.D. x .625 O.D. x .063 Thick | 4 |
| 8 | 230-0228 | Bolt, 3/8-24 x 1.25 Long, Hex Head | 4 |
| 9 | 240-1159 | Shim, .032 Thick | 16 |
| 10 | 150-8850K | Pads, BP-10 Compound, Axle Set | 1 |

NOTES: Part Number 230-0233D Rotor Bolt Kit, includes part number 230-2043
 Part Number 230-0204 Mounting Bolt Kit, includes part numbers 230-0228, 240-10190 and 240-1159

Exploded Assembly Diagram

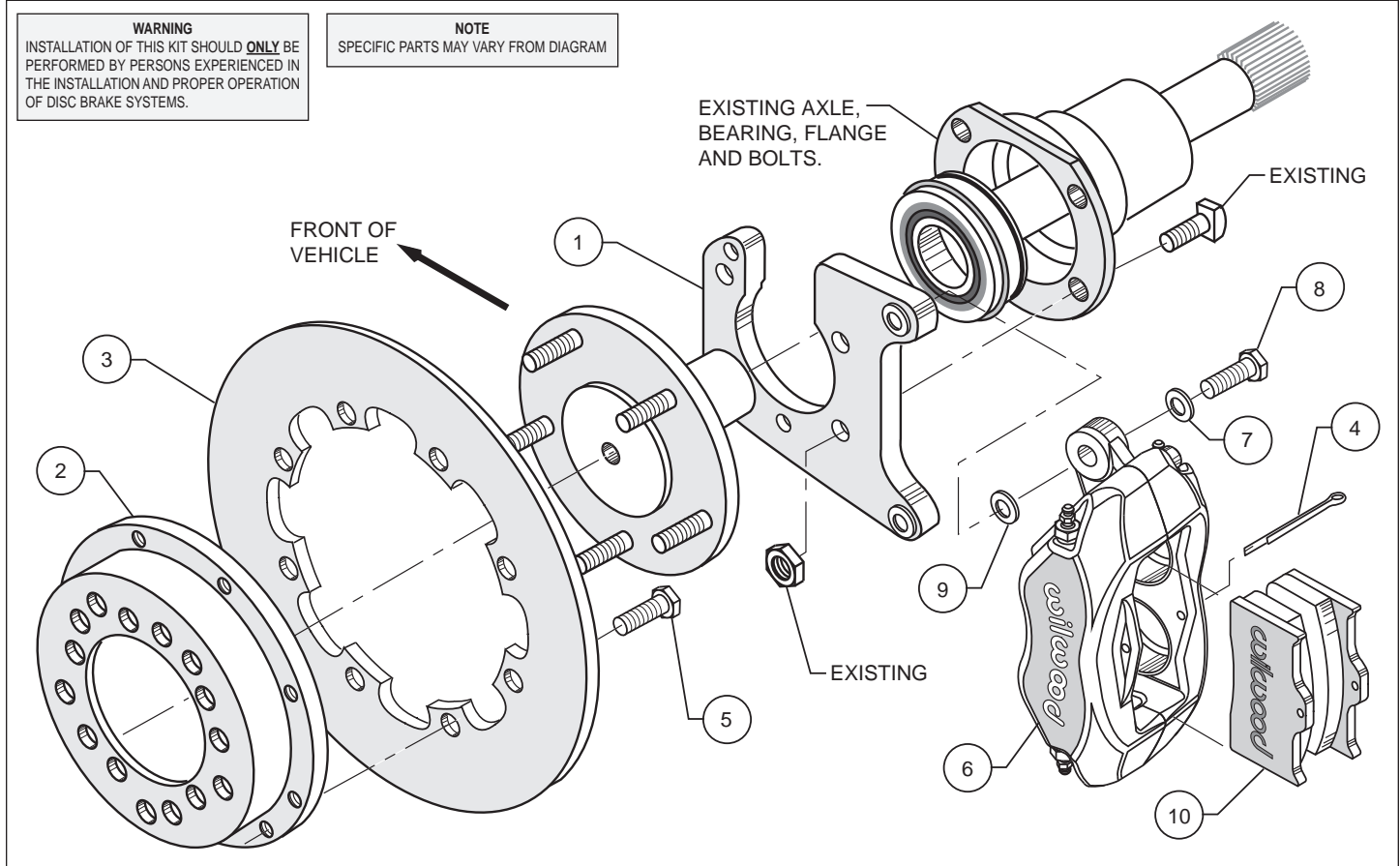


Figure 3. Typical Installation Configuration

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

- Make sure this is the correct kit to fit the axle housing flange, not necessarily the rear end make. Many times after market manufacturers put a different make of axle housing flange on the stock rear end housing (see Figure 8). Example; Big Ford rear ends with Olds-Pontiac flanges, therefore, an Olds-Pontiac rear disc brake kit would be the correct kit to order.
- 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.
 - Axle housing flange mounting pattern to pattern in bracket.
 - Stud pattern on axle flange to stud pattern in hat.
 - Dimension from wheel side of axle flange to wheel side of axle housing flange (see Figure 8, 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.
 - Verify that the wheel axle stud size is 0.50" diameter. The Wilwood hats utilized in these kits are drilled for 0.50" diameter wheel studs.
 - Maximum axle flange diameter must be no larger than 6.11" w/.050" x 45° chamfer, Figure 4.

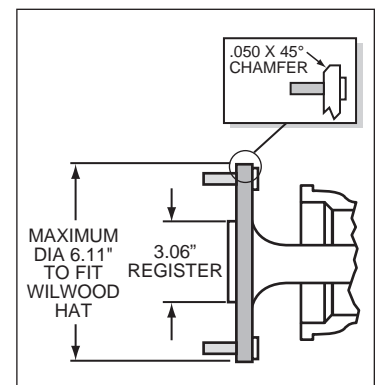


Figure 4. Axle Flange Maximum Dimension

Disassembly and Assembly Instructions

Disassembly Instructions:

- Disassemble the original equipment rear brakes:

Raise the rear wheels off the ground. Support the rear suspension by placing jack stands under the rear axle or vehicle frame. The vehicle's weight must be on jack stands and not supported by a car jack or hoist.

Completely disassemble the stock brake system down to the bare axle. The stock bearing must be "pressed" off from the axle. Discard the original bearing and flange. Degrease and remove any dings or burrs on the axle which may interfere with the brake assembly. A new Green non-adjustable bearing and seal kit (purchased separately) must be pressed onto the axle. The Wilwood caliper mounting bracket (1) has been designed to replace the original flange and fit over the new bearing. Insert the axle into the rear end housing and secure.

Assembly Instructions (numbers in parenthesis refer to the part list/diagram on the preceding page): **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.

- With the slot pointing upward and the mounting ears pointing towards the rear of the vehicle, install the caliper mounting bracket (1) to the axle housing flange using the stock Original Equipment Manufacturer (OEM) bolts and nuts. Stock OEM hex nuts that retain the bracket (1) should be on the wheel side of the bracket. Apply red *Loctite*® 271 to the stock OEM bolt threads and torque to OEM specifications. **NOTE:** Some brackets act as the bearing retainer, while others help locate the bearing in the axle housing flange. Make sure the heads of the caliper mounting bracket insert nuts are FACING OUTWARD TOWARDS THE WHEEL.

- The rotor (3) has two sides. A flat side and an inset side. Bolt hat (2) to flat side of rotor (3) using bolts (5). Using an alternating sequence, apply red *Loctite*® 271 to the threads and torque bolts to 25 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 6. Please refer to Wilwood's data sheet DS-386 for complete safety wire installation instructions.

- Align the correct hole pattern in the hat (2) with the stud pattern on the axle flange. **NOTE:** Some OEM and after market axles come with stud sizes larger than 0.50" diameter. Verify stud size and have a qualified machine shop drill the hats to the correct size. Slide the hat/rotor assembly (2 and 3) over the wheel studs and against the axle flange face.

- NOTE:** Please reference the caution statement at the beginning of the assembly instructions. Mount the caliper (6) over the rotor (3) and onto the caliper mounting bracket (1) using the washers (7) and mounting bolts (8). View the rotor through the top opening of the caliper. The rotor should be aligned in the center of the caliper. If not, adjust the caliper by using 0.032 inch shims (9) by placing them between the caliper mounting bracket (1) and the caliper (6). Add as many shim washers (9) as necessary to achieve the correct alignment. **NOTE:** The end of the bolt must be flush with or slightly protruding from the head of the clinch nut. See Figure 6. Place spare shims (9) between washer and caliper mounting ear to achieve the proper mounting fastener configuration. Always use the same amount of shims on both the top and bottom caliper mounting bolts (8). Apply red *Loctite*® 271 to the mounting bolt threads (8), torque to 30 ft-lb. Caliper mount bolts may be safety wired for additional security.

- Position the Wilwood disc brake pads (10) into the caliper (6) and fasten with cotter pin (4). Steel backing plate side of brake pad should face the caliper pistons.

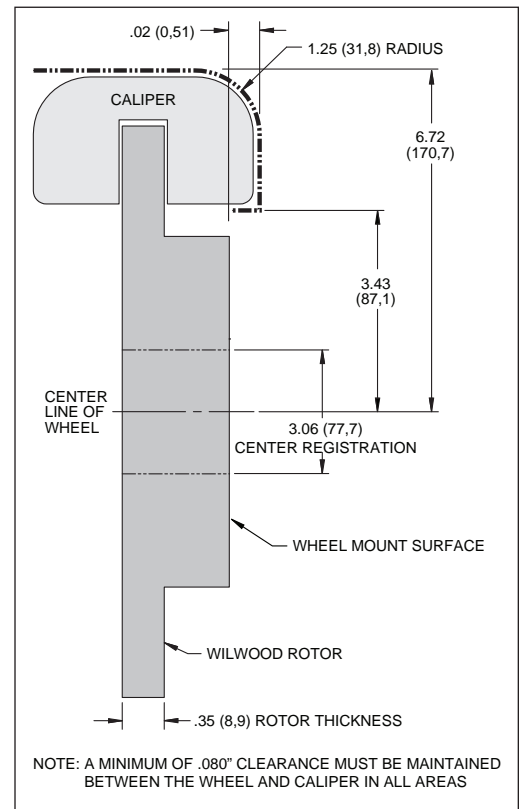


Figure 5. Wheel Clearance Diagram

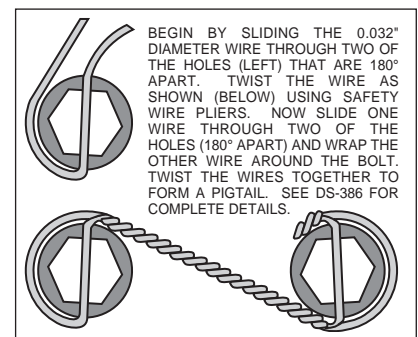


Figure 6. Safety Wire Diagram

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 lines to prevent contact with moving suspension, brake or wheel components.** 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.

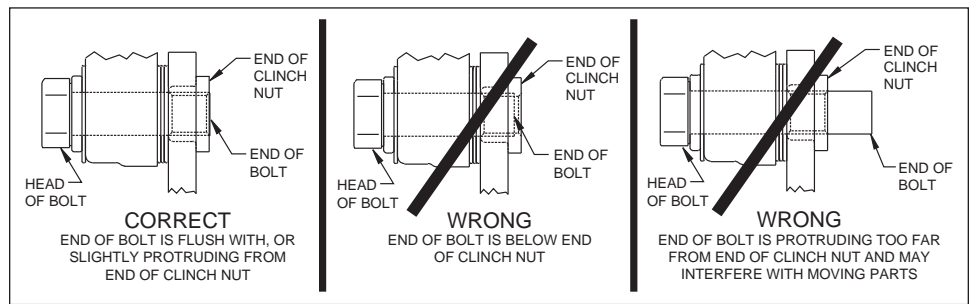


Figure 7. Clinch Nut Engagement Diagram

- 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. Reference the general information and recommendations on page 6 for proper bleeding instructions.

Assembly Instructions (Continued)

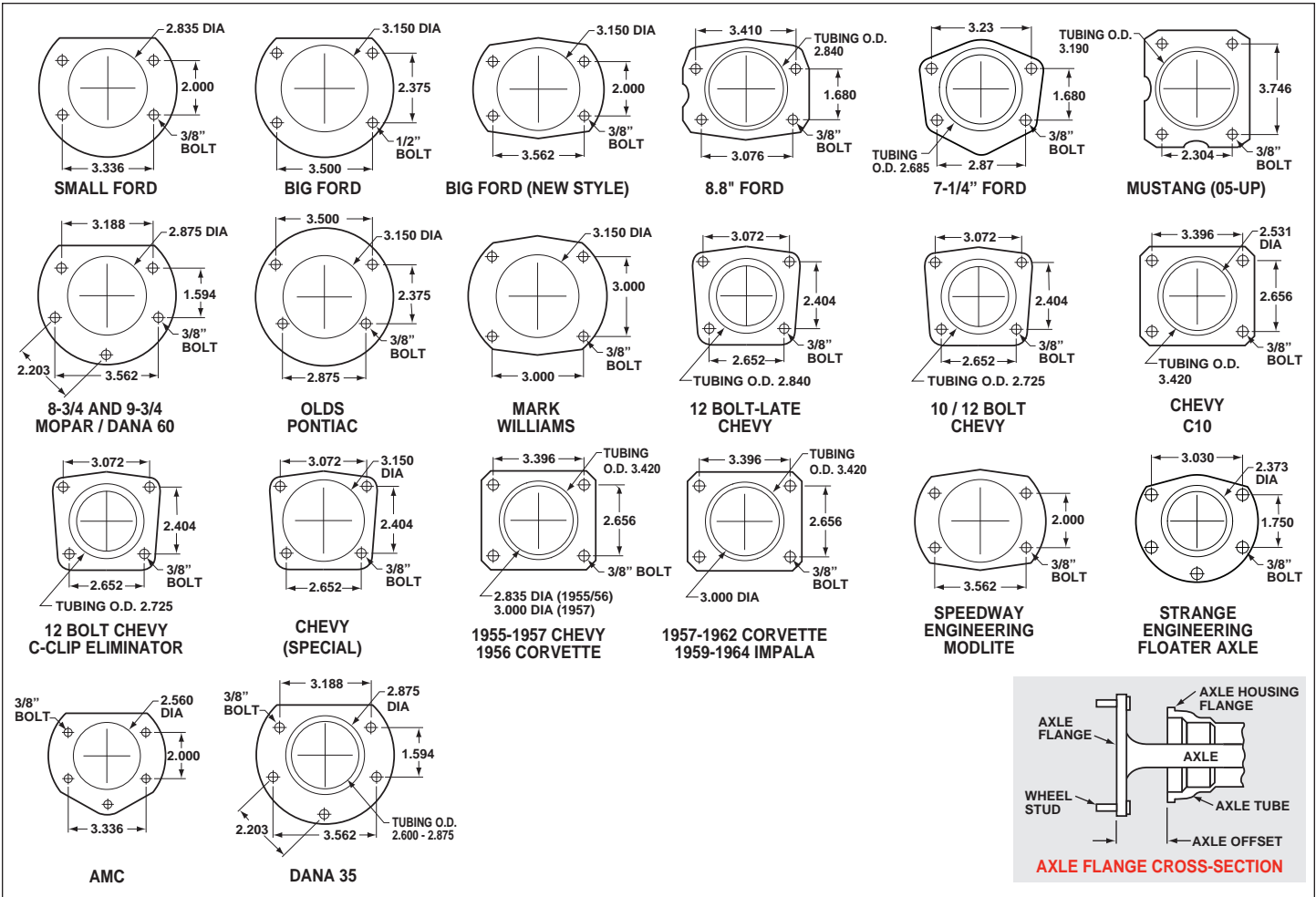


Figure 8. Rear Housing Flange Chart and Axle Flange / Offset Cross-Section

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^o 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.

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.