

# ***ALPHA***

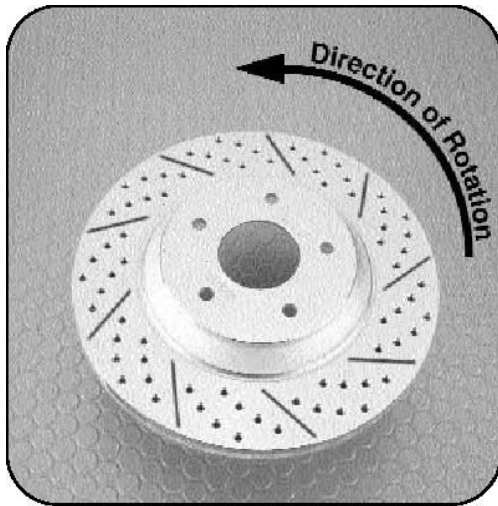
## Packet contents:

- Rotor and Pad bedding instructions
- Rotor installation and rotation instructions
- Brake Bleeding instructions

For any reason should you have questions regarding your brake system and or instructions, please contact:

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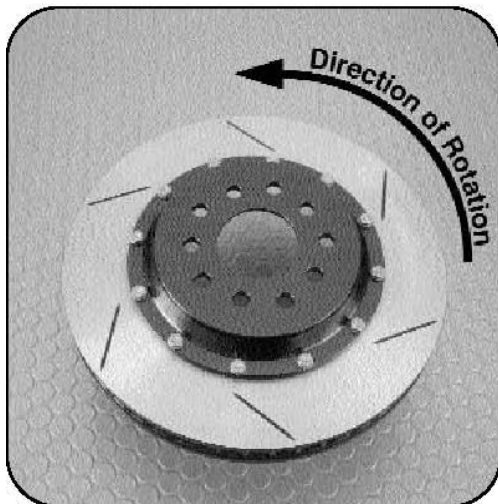
# STOP - Read This Notice!



**Failure to install rotors in the correct direction will cause premature failure!!**

Rotors that are directionally ventilated must rotate in the correct direction to obtain proper airflow for cooling.

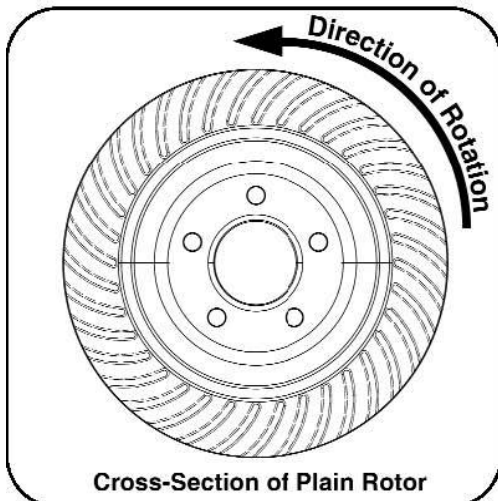
Externally modified rotors employ a REVERSE SLOT or a REVERSE SLOT & DRILL pattern. This is current racecar practice and lowers the potential for "carbon smearing" or "transfer" from the pad material to the trailing side of the slots on the rotor. This is important because, in some cases this "smearing" actually affects the rotational balance of the rotor and can cause a "shake" or "nibble" while braking.



Non-modified or plain rotors that employ a curved vane design must also rotate in a specific direction. The curved vane rotor is designed to draw air into the center of the rotor and force the air to exit from the outer edge (see diagram on left).

## **Additional rotor details:**

Provided in the packet are specific break-in procedures to ensure you will achieve optimum rotor performance and durability in the, "Rotor Seasoning & Pad Bedding" instruction sheet.



A removable stick-on label is placed on the rotor to designate which side of the vehicle the rotors are to be installed. Those marked "L," left are for the driver's side, while those marked "R," right are for the passenger's side.

The rotors shown are all DRIVER/LEFT SIDE rotors. As you can see the surface slots rotate forward. Always be sure to install the rotors in this fashion. **NEVER INSTALL ROTORS IN THE OPPOSITE DIRECTION OF ROTATION**, heat related fatigue, and failure will result.

# **Rotor Seasoning & Pad Bedding** **Street or Light Track Applications**

## **What proper "Rotor Preparation" is all about**

The first step in preparing the brake system for duty is to "Season" the rotors. The most visible effects are that of burning the machine oils from the surface of the iron and establishing a wear pattern between the pad and rotor. The most complex task it performs is that of relieving the internal stresses within the material. If you've ever poured water into a glass of ice, and noticed the ice cracking, then you've witnessed, first hand, the effects of internal stresses. The rotor casting and cooling processes leave the rotor with internal stresses.

By gradually heating the material, the crystalline matrix will reconfigure to relieve these internal stresses. After these stresses are relieved, the rotor is ready to accept the heat of bedding pads. Heating the rotors before they are fully seasoned can result in material deformation due to the unrelieved internal stresses in the material. This deformation may cause a vibration from the brakes.

Rotors need to be gradually elevated to "race" temperatures before any severe use. A "nibble," or slight vibration, normally indicates rotors that were heated too quickly.

After initial "Seasoning," when running your car at open track events or serious canyon carving, you should use the first lap of a session (or first couple of miles of open road), to warm the brakes as well as the engine, gearbox, etc. Where an engine turns chemical energy into motion, the brakes turn that motion into thermal energy...and lots of it! And where there is no cooling system for the brakes as there is in the engine, and there's not, the brakes could use the courtesy of a warm-up lap.

Remember to ALWAYS WARM THE BRAKES before any heavy use! It is also considered mandatory to run air ducts to the eye (center) of the rotor on any car used on track or in actual competition.

## Rotor Seasoning Procedure:

Before you begin, please note:

The following represents the minimum recommended "Seasoning" process. If your situation offers any opportunity to perform gentile preliminary "Seasoning" outlined in Step 2 below for a longer period of time, this will generally render even better performance and increase further long term rotor life.

1. Use the vehicle for 5 to 6 days of gentle driving. Use the brakes to the same extent that you used the stock brakes. **DO NOT TEST PERFORMANCE OR ATTEMPT HEAVY USE UNTIL ALL ITEMS OUTLINED HAVE BEEN COMPLETED.** It is imperative that excessive heat is not put into the rotors at this stage. They need temperature-cycling to relieve the internal stresses.

**\*\*Note:** Zinc plated rotors (optional performance upgrade) need a couple of extra days of driving to wear through the plating before "Seasoning" will actually begin.

2. After completing 5-6 days of gentle driving, find a safe location where the brakes can be run to temperature. Your goal is to gradually increase brake temperatures with progressively faster stops.

**A.** Start by performing (4) stops from 60 mph to 15 mph, as you would in the normal course of driving.

**B.** Next, perform (4) medium effort pedal stops (about 50% of maximum stopping force) from 60 mph down to 15 mph. Follow this with (5) minutes of freeway driving with LITTLE to NO BRAKING to allow the rotors to cool.

**C.** Next, perform (4) medium-hard effort pedal stops (about 75%) from 60 mph down to 15 mph. Follow this with (10) minutes of freeway driving with LITTLE to NO BRAKING to allow the rotors to cool.

**D.** Park the car and allow the brakes to cool down overnight to ambient temperature. You are now 50% done with the rotor "Seasoning & Bedding" procedure. Proceed to STEP 4 the following day.

3. Return to the safe location where the brakes can be run to temperature.

4. Ensure the brakes are warmed to full operating temperature.

**A.** Perform (4) medium effort pedal stops (about 50%) from 60 mph down to 15 mph. Follow this with (5) minutes of freeway driving with LITTLE to NO BRAKING to allow the rotors to cool.

**B.** Next, perform (4) medium-hard effort pedal stops (about 75%) from 60 mph down to 15 mph. Follow this with (10) minutes of freeway driving with LITTLE to NO BRAKING to allow the rotors to cool.

**C.** Now, make (6) HARD pedal stops from 60+ mph down to 15 mph, or until the rotors have reached an operating temperature between 900°F and 1,100°F. Every effort should be made to perform this procedure without locking a wheel. Follow this with (10) minutes of freeway driving with LITTLE to NO BRAKING to allow the rotors to cool.

5. Let the brake system cool off overnight so that it will be ready for pad bedding.

## **Pad Bedding Procedure:**

### **The Importance of Bedding Brake Pads**

The friction material in semi-metallic pads is held together by an organic binder, usually a type of phenolic material. As the pads get hot, the binder boils and burns, from the top surface of the pad. Once this burning or "Bedding" takes place, the friction material makes proper contact with the rotor.

Some race/performance pads are designated as "pre-burnished" from the manufacturer. In our experience, these pads still benefit from "Bedding." "Bedding" pads establishes a wear pattern between the pads and rotor. Some pads deposit a layer of carbon on the surface of the rotor. They need that layer of carbon to perform at peak efficiency.

### **Bedding Metallic or Carbon/Metallic Pads - (NEVER "drag" the brakes)**

Note: Never "Bed" pads on rotors which have not first been "Seasoned". Always allow a substantial coast down zone when bedding pads that will allow you to safely drive the car to a stop in the event of fade.

1. Perform (2) repeated light to medium stops, from 65 to 10 mph, to bring the rotors to temperature.
2. Perform (2) heavy stops, back to back, at a point just pending wheel lock or ABS actuation, from 65 mph to about 5 mph.
3. Drive for (5) to (10) minutes to create cooling airflow, without using the brakes if at all possible.
4. Perform (3) light stops in succession.
5. Perform (8) heavy stops, back to back, at a point just pending wheel lock, from 65 mph to about 5 mph.
6. Drive for (10) minutes to cool the rotors, without using the brakes if at all possible.

**\*\*Note:** Metallic brake pads need high temperatures to keep the pad "Bedded". If you drive the car for a period of time without using the brakes extensively, you may need to "Bed" the pads again. This is not a problem. Simply repeat the procedure.

When switching from any performance or other Carbon Metallic pads to semi-metallic brake pads (something we do not recommend), you will need to wear through the layer of carbon that the performance pads have deposited on the rotor surface. The new pads won't grip well at all, until this layer of carbon is removed. Racers should "Bed" a few sets of pads at a time.

In the event you need to change brake pads during a race, you **MUST** use a set of "Bedded" pads. Racing on "non-bedded" pads leads to a type of "fade" caused by the binding agents coming out of the pad too quickly. This is called "green fade". These binders may create a liquid (actually a gas) layer between your pads and rotors. Liquids have a very poor coefficient of friction. This condition is the reason for reverse slotting or cross-drilling rotors, as it allows a pathway for the gasses to escape.

# Bleeding

Always remember, good-to-excellent brakes or fluid do not function without adequate cooling. In fact, the more serious your brake system, the more attention needs to be directed to proper ducting, as they will generate more heat due to the increased capacity.

## **Proper Bleeding Procedure:**

Slowly pour fluid into the master cylinder so as not to aerate the fluid. Enlist someone who will help you bleed the brakes. Ensure they too, read these instructions carefully to understand the goal.

BLEEDING BRAKES IS NOT DONE WITH PRESSURE. IT IS PURELY A FUNCTION OF MOVING FLUID THROUGH THE SYSTEM. THE OBJECT IS TO DISPLACE AIR, NOT TO SEE HOW FAR FLUID CAN BE SHOT OUT OF THE CALIPER!

1. For systems which are essentially dry front and rear, start by filling the master cylinder with proper fluid.
2. Next, attach the clear plastic bleed line to the bleeder at the caliper farthest from the master cylinder and open it. VERY SLOWLY, stroke the brake pedal by hand or foot until fluid comes out. Now close the bleeder.
3. ACTUAL BLEEDING SEQUENCE:
  - A. Have your partner very slowly, with modest pressure (approximately 25-30 lbs/ft), stroke the pedal ONE TIME until hydraulic resistance is encountered. Ask your partner to hold at this point with the same modest and even pressure, and notify you that he/she is, "holding."
  - B. Open the bleeder, letting the pedal go to the floor or until it stops using the same modest level of pressure. Close the bleeder, notify your partner that, "the system is sealed."
4. Repeat "Bleeding Sequence" (never stroke the pedal more than one time), until all signs of air are purged (no bubbles) from fluid.  
**IMPORTANT: DO NOT LET THE MASTER CYLINDER RUN DRY.** Be sure to check fluid level after every third bleeding sequence or sooner if reservoir volume is very small.
5. Move to the location next furthest from the master cylinder and repeat the procedures previously outlined. Continue until all calipers have been bled. You are now 75% complete with the bleeding process.
6. Take a small block of wood or a plastic hammer, and carefully tap the calipers to dislodge any additional air bubbles that may be trapped.

**\*\*Note:** Before reinstalling wheels and placing the car on the ground, we recommend you carefully wipe clean all caliper surfaces, hose joints, and fittings, making sure they are all dry and free from seeping. If not, inspect and tighten appropriately. Spray all rotor surfaces with Brake Klean® or a similar product to remove any dirt and oils from your hand that may have been transferred to the rotor during assembly.

Also, remember to remove the nuts, and washers which have been holding the rotor in place, before attempting to re-install the wheel. For street use, as with any time you open the brake system, it may be advisable to repeat the bleeding procedure after driving the vehicle for a day, as driving the car may dislodge some additional air bubbles. For competition cars, we recommend repeating this procedure directly after at least the first two sessions the car is on track, and at the beginning of each race weekend thereafter.

Even if your pedal is high and firm and additional bleeding is deemed unnecessary, always inspect the calipers, hoses and fittings after the first outing for signs of any fluid seeping, and correct immediately.