

# Bendix®

Brakes

BBA 99-02

November 1999

# Alert

## Poor Initial Stopping Performance After Disc Pad Replacement

### Does it Stop?

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After the disc pads are replaced and/or rotors serviced, how does the pedal feel? Does the vehicle stop like you feel it should? If it feels like the brakes were better before the brake job was done, here are some things to help you understand what happened.

You no doubt have heard that turning rotors and "breaking-in" the pads is a good thing to do. But what about those first stops backing out of the shop? If you have panicked and felt that the brakes were not good, then installed a different brand and the vehicle stopped much better, you have been fooled by the characteristics of semi-metallic brake pads.

Original equipment vehicle manufacturers use semi-metallic brake pads as they provide great performance, stopping, wear life, and fade control at high temperatures. When it comes time to replace the pads, the process has to start all over again to achieve the performance level of the original brakes.

### What the OE Manufacturers Say

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In every new vehicle owner's manual, there is some information about how to drive the vehicle when it is new. It usually cautions the driver to take it easy for the first hundred to a thousand miles of operation. In the Ford Ranger and Buick Century owner's manuals, for instance, it states specifically to *"Avoid making hard stops for the first 200 (Ranger, 1000) miles or so. During this time your new brake linings aren't yet broken in. Hard stops with new linings can mean premature wear and earlier replacement. Follow this breaking-in guideline every time you get new brake linings."*

Additionally the OEs have issued Technical Service Bulletins (TSBs) regarding brake pad and/or rotor servicing. They state that rotors should **not** be turned if there is no pulsation, still smooth and are within specification.

Also, brake "burnishing" or break-in procedures are covered by all the major brake manu-

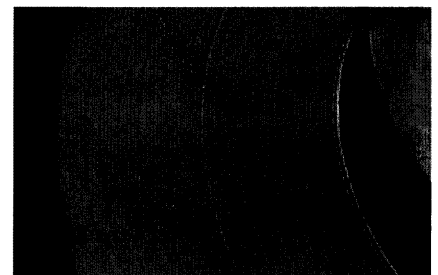
facturers. *Make 15 to 20 slow stops from 30 mph using light to moderate pedal pressure. Allow 30 seconds between stops to cool the brakes.* These are all important tips, and will solve many brake problems.

### Experience has Shown

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But you say that you like to turn every rotor and the pads should stop right away. This might have been the case a few years ago, but let us take a look at what happens on a vehicle with semi-metallic pads.

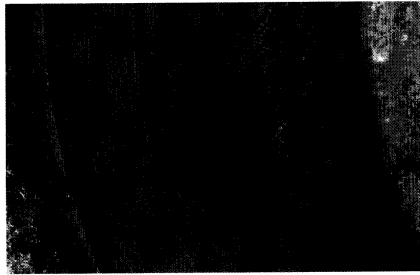
#### Poorly Machined Surface



A poor rotor surface, as shown here cut at fast speed with no finish cut or swirl, will not be smooth enough to allow for prop-

er pad break-in, and it *can* make noise. The other thing is, that it will not give good stopping ability for the vehicle.

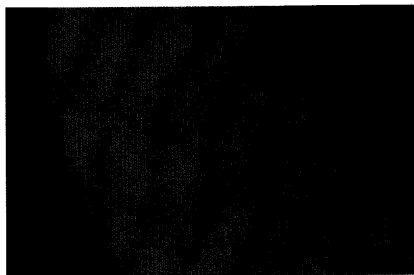
### Friction Material Lining Transfer



During the burnishing or break-in procedure, there is rotor surface conditioning that takes place. As shown in the illustration of a rotor above, the material from the brake pads is imbedded into the surface of the rotor during break-in. Some of the rotor surface, from normal wear, is transferred into the pads.

This conditioning is similar to race teams using tires that they have run a few laps on during practice, versus brand new "sticker" tires. Even so, it is necessary to run a few laps before they start to really work.

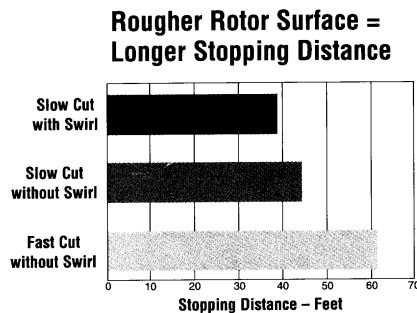
### Smooth Machined Surface



A smooth surface, such as the freshly machined rotor shown above cut at slow speed with a polished finish, is correct for the burnishing procedure and rotor conditioning. Understand that it will take longer to achieve the

same conditions as a good used rotor surface. Testing has shown, by the graph below, that the smoother the machined rotor surface, the less distance it takes to stop the vehicle.

How much difference does rotor finish make? Well if you really don't think that it makes any difference, the chart below illustrates that a smoother rotor surface will result in shorter stops!



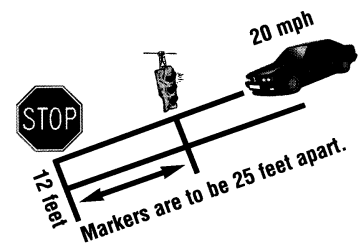
### More Filling, Stops Great

When new pads contact against a fresh rotor surface for the first time the conditioning and material transfer starts. If you decide that is not good enough at that point, and change pads, the new pads contact a surface that has already had some conditioning. They will stop great. Let's look at this situation from a different angle.

Has there ever been a job you did that, for whatever reason—lack of time, parts, equipment—, you didn't turn the rotors? The vehicle stopped OK afterwards? Well this is because the new set of pads contacted the conditioned, smooth rotor surface and didn't have to start the process from the beginning. The rotor conditioning is done and the new, or second, pad set will act like the "lap" tires on a race car.

An acceptable criteria for evaluating stopping comes from

the *Motor Vehicles and Equipment Manufacturers Association* in Detroit, MI, and is also used in some states for inspection.



### Stop Here or Sooner

Mark off a lane 25 feet long and 12 feet wide. Enter the lane at 20 mph and apply the brakes with hands lightly on the steering wheel. The vehicle should stop within the length and not pull outside of the width of the lane.

### Details, Details, Details

To address the poor stopping ability of a vehicle after a brake job, follow the advice of the OE vehicle manufacturers and after-market brake suppliers.

- Measure specs of rotors before servicing.
- Machine only when necessary.
- Use only sharp tool bits and change the points often.
- Polish the machined surface smooth for 60 seconds minimum with non-directional finishing tool.
- Wash with soap and water after machining.
- Index hubless rotors to minimize runout.
- Perform the complete burnishing procedure as outlined in the beginning of this article.
- Remember, "Don't fry the pads".
- Finally, counsel with your customer as to the recommendations of the OEs to take it easy at first.

Follow these steps and you will get great results.