

ROTOR MACHINING & RESURFACING

Resurfacing rotors may be simple, but as with any other machining process you should be aware of why you are doing it and how to do it correctly.

If a customer simply brings rotors to you off the car for machining, you have no way to know why you are turning them other than to make them smooth. In reality, you should take a few minutes to read the brake system and understand the need for any particular service.

OE rotors such as those pictured here from a Ford truck are relatively expensive. As long as they have adequate thickness remaining, as these did, they can be resurfaced instead of being replaced, saving the customer considerable cost.

What caused the runout problem addressed in the following photos is not known, but it was not rust and scale between the rotor and hub. The problem may have occurred because of thermal shock – a very hot rotor being splashed with water from a puddle – or it could be attributed to buildup of transfer material from the pads. These two areas will be addressed in future articles.



This brake system has pulsation present, and the rotors have been machined before to eliminate that problem. Perhaps you should find out the reason for the pulsation before turning the rotors. Note the amount of transfer material on the rotor surface.



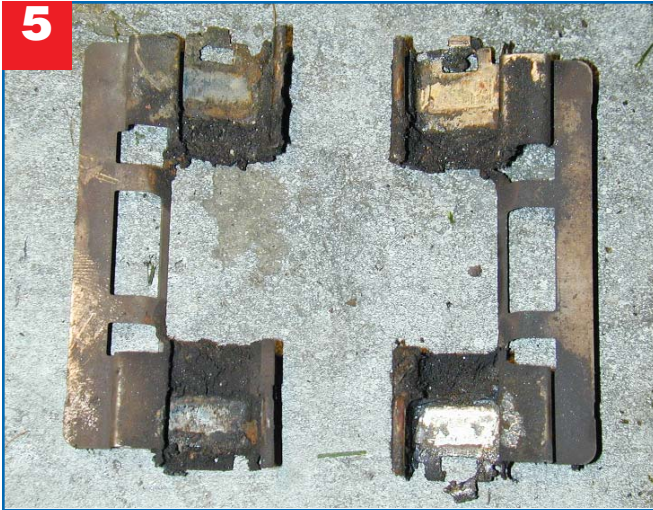
Indexing the rotor to a specific stud is a good habit to get into. This will allow you to reinstall the rotor in the same position, and if you are working on a Ford vehicle that may be critical.



This is the area where the pad contacts the hardware. There has been adequate lubrication and there is no restriction of pad movement in this area, so you can eliminate that as a possible cause.



Looking at the edge of the pad shows that it has been moving and was not rusted in place.



5 Rust and scale buildup on these pad clips is not excessive.



8 This is the first step in indexing a rotor to check runout. The special washers weren't available, so the technician used large flat washers that accepted the tapered end of the lug nuts. Using a torque stick, he torqued all six lug nuts onto the rotor.



6 When the caliper pin is slid outward, it is evident that the boot is dimpled inward. If you don't notice this condition, a torn boot can result.



9 The dial indicator is set up and zeroed in to the reference mark on the rotor.



7 This is how the boot should look.



10 The rotor then is rotated one complete turn and the high point of runout is noted. You must know the amount of runout and where it is to mount the rotor on the lathe correctly.



11
The inside of the rotor hat is still coated with the lubricant applied the last time the rotor was serviced to keep rust and scale from building up.



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Note the coating on the hub surface. Ford began lubricating hub surfaces on its trucks in the 2004 model year to prevent rust and scale, so this is an authorized procedure.



13
The hub face is being washed to remove the anti-corrosive coating so runout can be measured accurately.



14
You can see that the lubricant has prevented rust on the hub face.



15
The dial indicator is set up to check runout on the hub face. The needle did not move noticeably during a complete revolution of the hub, so the runout did not result from stacked tolerances caused by the hub face.



16
Because the rotor had considerable rust and scale in non-contact areas, it was cleaned in a blasting cabinet before machining.





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With the inside of the hat area cleaned, the rotor was mounted on the lathe and runout was measured. Loosening the spindle nut and rotating the rotor slightly matched runout on the lathe to that on the vehicle so the rotor could be machined properly.

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The final step in rotor resurfacing should be a non-directional finish. The hone being used here does an excellent job if you maintain the rotational speed of 100 rpm recommended by its manufacturer and apply even, moderate force.

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The reason for applying a non-directional finish is not to smooth a poorly machined rotor but to provide a surface on which the pads can seat properly.

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After resurfacing a rotor, you should clean it with soap and water to remove metal particles. After washing the rotor, you can finish with a brake-cleaning product if you wish.

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This product that is sprayed onto the rotor surface to help prevent brake noise also works well for preventing rust and scale on the inside of the hat. The spray coating adheres well to this area.

24



The same product is being used to coat the hub face to prevent rust. The studs have been covered so that the spray-on product won't act as a lubricant and interfere with proper torquing of the lug nuts. **UD**

Thanks to Brake & Equipment Warehouse and Al Schrum for the use of their equipment and his time to shoot these photos. Brake & Equipment is at 455 Harrison St. NE, Minneapolis. Call 612-378-3141 or visit www.brakeplace.com.