

Rear Brakes – Rotors and Pad Replacements

2002 F250 PSD (2WD)

Guzzle has excellent instructions for the front brakes system on a 4WD PSD, they are not exactly what you need for a 2WD application. I did, though, use some of his tips and insights which were very helpful. Therefore, I have compiled as many pics as I thought helpful and added my notes to each as a pictorial walk-through for my rear brake job.

IMPORTANT: These notes do not relay the only safe way to do this work, nor do they imply that if you follow these steps you will not get hurt. Use safe practices; follow manufacturer guidelines and instructions in regards to the safe use of tools. For example, use wheel chocks; use jack stands which are rated over 3,000 lbs; work on a level and HARD surface (if you work on dirt, use a sheet of heavy plywood or sheet metal under the jack stands), etc.

TOOLS & Supplies

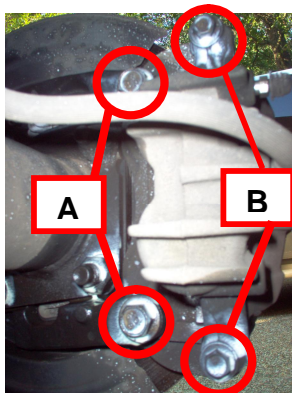
brake pads, rotors, caliper slide pins, and potentially a “hardware kit” with new caliper clips and pin boots
penetrating oil
brake cleaner
high temperature anti-sieze brake lubricant
brake fluid
either a 6” C-clamp, 12” “quick clamp”, or short pipe/bar clamp for compressing caliper pistons
short 2x4, rubber mallet, and 2 short pipe clamps (for pulling stuck rotors)
torque wrench good for at least 150 ft-lbs
ratchet and socket set (metric and SAE)
small ¼” tubing and pint mason jar (for draining and capturing brake fluid from system)
5-gallon bucket or stiff wire (to support the caliper so that it does NOT hang suspended by its brake line)

INSTRUCTIONS & Comments

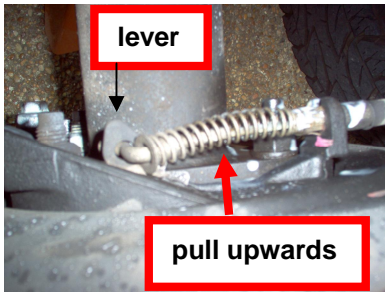
1. START by jacking up the truck and removing only one tire. After spraying it down with penetrating oil detailed in the first two steps below, then remove the second tire and repeat the use of the penetrating oil. This will give the oil a few minutes to begin working on the first wheel’s hardware before you begin tearing down the brake system.
2. NEXT, use the tubing and mason jar to bleed about 2/3 of the pint of brake fluid from the system. This will prevent you from making a mess when you work on inserting the new brake pads. I’ll explain that later.



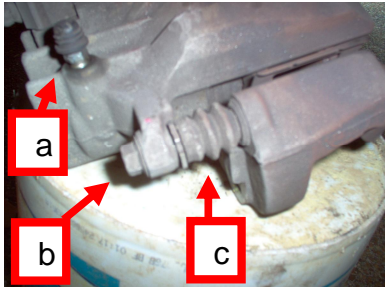
3. There is the culprit. To the untrained eye, it will look like the rotor is almost part of the hub. As early as possible, spray penetrating oil into the base of EACH of the lug bolts and ALL around the base of the hub/rotor joint (two arrows show these places). This should make the rotor removal easier.



4. Back side of the caliper. The circles show the four bolts which will need to be sprayed with penetrating oil to help break them loose and remove them. After giving the oil a few minutes to work, break loose all four bolts without removing any of them. The two bolts closest to the rear axle (“A”) are the caliper bracket bolts which hold the caliper to the wheel, while the other two bolts (“B”, smallest heads) are the caliper pin bolts.
5. Remove the caliper bracket bolts “A” and carefully maneuver the caliper off the rotor. Set the caliper on an overturned 5-gallon bucket for support. DO NOT let the caliper hang by the brake line or you may rupture the line. You can also suspend the caliper with a piece of wire if a bucket is not available.



6. This is the spring tensioned attachment for the parking brake. You must stretch this upwards and maneuver the metal end of the cable out of the lever which extends from the back side of the wheel assembly. It's a wrestling match to say the least, but it is possible to get this off, and it **MUST** be done to release the parking brake shoes' pressure from inside the rotor in order to remove the rotor.

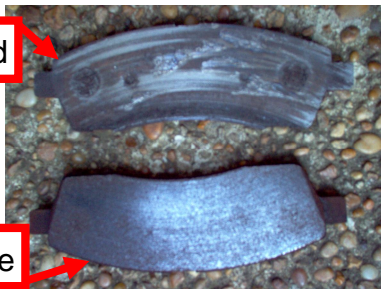
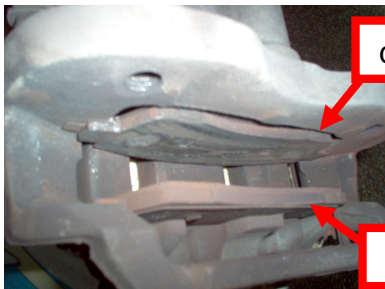


7. Here is a shot of the caliper slide pin boot "c", which was obviously dry and, in my opinion, in need of replacement. First, check to see if your slide pins are performing properly by sliding the two caliper parts in and out. Anything less than perfectly smooth action indicates a problem. Go ahead and remove both caliper pin bolts and separate the two caliper pieces.

a = brake bleeder fitting b = caliper slide pin bolt c = caliper pin boot

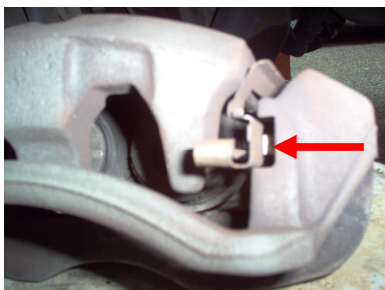


8. I had one caliper slide pin which was completely dry and severely corroded, even though it seemed to slide in and out with no trouble. Further inspection did reveal some heavily scored portions from being forced in and out of the pin socket. Inspect all pins carefully. I ended up replacing not only the pins, but also this caliper's slide bracket due to corresponding corrosion scale buildup inside the socket which would not allow the new pin to be fully inserted. Rather than trying to drill it out, I replaced the part.



9. Here is a shot of the inside of the caliper with both brake pads identified. Remove both brake pads by simply pushing them out of the caliper clips towards each other. My inner pad was gone, leaving only metal-to-metal on the caliper.

d = inner pad e = outer pad

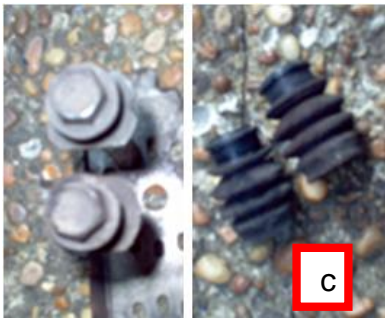


10. Remove the caliper clips by simply pushing them out of their positions (direction of the arrow). You may or may not need to replace the clips depending upon condition. Sometimes, they are corroded into place on the caliper, and end up getting damaged during removal.



11. These are the caliper clips (from the ends of the pads) and the piston pressure distribution plate (from behind the inner pad, between the pad and the pistons). Inspect these for damage or severe corrosion and replace as necessary.

f = piston pressure distribution plate g = caliper clips



12. Remove the caliper slide pins and boots and inspect for damage - corrosion, nicks, scratches, tears, cracks, etc. and replace as necessary or desired.

h = piston pressure distribution plate c = caliper slide pin boots

NOTE. Guzzle's front brake system instructions show the pin heads like these to the left and states that each pin has a different diameter. This is NOT the case for the rear brakes. Both slide pins are the same diameter, and the new pins do not come with a slotted shoulder flange like in the picture to the left.



13. Inspect the rubber seals around the pistons for any leakage. If there is any leakage, you may need to rebuild the pistons with new seals (not covered here).

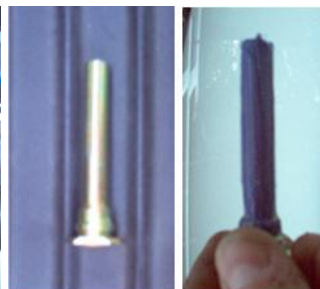
14. Use an old brake pad, piece of sheet metal, etc to cover both of the caliper pistons and then use a C-clamp, quick clamp, etc. to squeeze the pistons back up inside the caliper body (completely back inside, or there will not be room for the new rotor to fit between the new pads). Also, this is why you removed some of the brake fluid from the system - as the pistons are pushed back inside the caliper body, they displace fluid back up into the brake fluid reservoir which will overflow if it has not been drained down before hand.



15. If there is any corrosion or small nicks/scratches inside the caliper slide pin socket, you can cut a slot in the end of a small dowel and insert some emery cloth or fine sandpaper (nothing finer than 400 grit, and nothing coarser than 200 grit). With a drill, you can spin this polishing stick rapidly to clean out and polish the socket inner walls. This did not work on the socket where I had excess corrosion scale buildup, but can work for minor problems of this nature.



16. The brake parts I purchased came with a white silicon/teflon lubricant, but I chose to go with the purple product shown to the left due a reported popularity with local brake shops. It is a very high temperature anti-sieze compound that is rated for 2,800°F, and is made for brake applications like the caliper slide pins. Not cheap... \$18 for the 4 oz. bottle, but who want sto use cheap parts for your brakes, anyway, right? In a few pics below, I'll show you a few more places I used it aside from the caliper slide pins.



17. Following Guzzle's guidelines, use a Q-tip to apply a thin layer of anti-sieze inside the pin socket surfaces. Use the brush applicator to apply anti-sieze to the slide pins. Excess will get removed as you slide the pins into the sockets before assembling, and it can be wiped away with another Q-tip. After test-fitting the lubed pins, install the new boots and reattach the pins with the pin bolts. Torque to 27 ft-lbs.



18. I used a home-made jig for pulling the rotors. Place the 2x4 across the end of the hub and get a helper to put a second clamp in place. Both of you alternate tightening the clamps. You can use a heavy rubber mallet to help coax the rotor loose. I ended up using a metal hammer and more force than perhaps ideal because I knew I was replacing the rotors... if you're NOT replacing the rotors, be very gentle so as to not warp them during removal.



19. This is what the inside surface of my driver side rotor looked like when I got it off. The grooves were sometimes 1/8 inch wide and at least 1/16 inch deep. Your rotors should be smooth with no grooves or ridges at all if you've had normal wear.



20. Among the several suggestions posed to me by my buddies on Ford Truck Enthusiasts (or FTE, located at www.ford-trucks.com), someone also suggested that I do a thorough inspection of the parking brake pads while I had the rotors off. My pads looked good. You don't want to miss this inspection opportunity... they are about \$95 per side, and you don't want to have to tear everything back down again unnecessarily. Damaged pads will be so thin they look brittle, could have chips or pieces broken off, may appear crystallized, etc.



21. In order to hopefully help with any future rotor removals, I applied a thin layer of the high-temp anti-sieze to the mating surfaces between the hub and the rotor. Be VERY careful to not get the stuff inside on either the parking brake shoes or the inner rotor drum surface where the parking brake shoes come in contact.



21. Reinstall the new (or resurfaced) rotors by just sliding them onto the hub assembly.

22. Reinstall the calipers. Torque the caliper bracket bolts to 128 ft-lbs.

23. If you haven't flushed your brakes with new fluid in a while, now would be a good time to do that. Otherwise, top off the master cylinder reservoir.

24. "Bed in" your new brake pads properly in order to obtain optimum braking performance.

- Get on highway and run up to 60 mph (use brakes very gingerly until you're on the highway)
- Make an aggressive stop, but DO NOT come to a complete stop... at 10 mph release the brakes
- Accelerate back up to 60 mph and repeat the aggressive stopping effort, again releasing at 10 mph
- Do this cycle 8 times as quickly together as possible, and you can expect to feel the brakes get a little "softer" as they heat up, and this is normal
- After the 8th time, drive at 60 mph for about 10 minutes to cool down the brake pads and rotors
- Return home to let the brakes cool completely, using the brakes very gingerly until you're parked at home
- **IMPORTANT** - do not come to a complete stop or hold the brakes down while they're hot... this can result in permanent and irreparable damage to the rotors