



By Gail Wagner

"WENCH WITH A WRENCH"

Give Me A Brake, Okay ?

Oh, oh.....are the brakes on your car squealing, is the car pulling to one side, or is there a giant puddle of yucky stuff under your car on the garage floor? All of these problems point to an issue with your braking system.

The brakes are obviously an essential component to the safety of both you and your passenger. While brakes are quite reliable, your brake system does require some routine maintenance and problems can develop as a car ages. We wanna' stop when we wanna' stop, right?

A Little Background: How Brakes Work

The brake system in our Miatas are called "disc" brakes as opposed to the older "drum" brake system. Disc brakes use a rotor which is attached to the hub of the wheel with calipers, brake pads, and a hydraulic system (that's what brake fluid is for) to slow the car and bring it to a stop when the brake pedal is applied.

So when your brake pedal is applied, the hydraulic system increases the pressure being put on the pedal, which causes the calipers to push the brake pads against the rotor which slows the car and brings it to a stop. Ta-da ! ☺

Our modern disc brake systems are extremely reliable but there are a number of pieces/parts and some require routine maintenance and replacement which you should be aware. ☺

With My Apologies to David Letterman:

"The Top 10 Brake Concerns Every Driver Should Know"

- **Brake pads:** Worn out brake pads will cause the braking distance to increase and may cause a metal-to-metal grinding on the rotor surfaces (not good). If a brake pad gets cracks in its surface - caused from overheating the pad - then they will squeak or squeal when stopping. If the pads and rotors get overheated, then the stopping distance will be increased. Brake pads have a built in metal "scraper" that will warn of excess brake wear. Once you hear a squealing or scraping sound on a regular basis, it's time to replace the brake pads. I strongly suggest you use Mazda Miata OEM or OEM-equivalent (Akebono brand) brake pads for best wear and performance.
- **Rotors:** The brake rotor surface needs to be flat to keep contact with the brake pads. If the rotor surface is warped from heat damage, it will cause the brake pedal to pulsate up and down and the car to jerk when stopping. This is not the pulsating brake feeling for those of you with ABS antilock automatic braking system in later 1998+ Miatas. If your rotor is overheated, its surface

will be discolored blue to purple, hardens the surface and the brake pads will not be able to grip them. Then guess what? This will cause a car to not stop as quickly as it should. Note: if your Miata has been stored or unused for a while in a damp location, rotors can rust causing poor braking performance.

- **Leaks:** A leak in the braking system is usually a hydraulic (fluid) issue. If the brake pedal goes to the floor (talk about a sinking feeling!), it can usually be traced back to a leak. A leak in the brake line will result in a loss of brake fluid and eventually the brake system may fail altogether. That is REALLY not good. ☹ Leaks should be addressed immediately. A pool of brake fluid on the garage floor or a low brake pedal are all symptoms of this problem. Don't wait.
- **Sticking caliper:** The caliper and caliper brackets hold the brake pads and force them against the rotor to stop the car. Caliper pistons can become stuck and when this happens the car will usually pull to one side when the brakes are applied or the pads and rotors will be overheated or worn down too fast. It will also affect acceleration as the brake is sticking. A sticking caliper can be dangerous and should be repaired ASAP. Sometimes the caliper bracket slides will bind causing the same issues as a stuck caliper except only one pad will get worn down too fast instead of both.
- **Warped rotors:** Rotors can become warped if they are exposed to extreme stress. Mountain driving or towing (not with our Miatas, of course) can result in warped rotors. Extreme high performance driving without slowly cooling the brakes afterward can warp a rotor. Even parking a car next to a sprinkler system can warp a rotor! The cold water hitting the hot brakes can result in warping. Warped rotors will usually cause the steering wheel and car to "shake, rattle and roll" when the brakes are applied. Warped rotors may even increase stopping distance or cause the ABS antilock brakes to engage prematurely.
- **Brake fade:** If the car is taking longer than normal to stop, it is probably due to brake fade - you put your foot on the pedal and it slowly drops to the floor without stopping the car as quickly as it should. In most cases this is a short-term problem but it can turn into a long-term problem. For instance, driving down a mountain road will heat up the brakes making the pads and rotors less responsive. Once the brakes cool down they should return to their normal functionality. As time goes on though, brake fade can become permanent and then it's definitely time to replace the brake pads and rotors. Brake fade is the early sign of overheating the brakes and will damage the rotors and pads. Read \$\$\$\$\$.
- **Smoking brakes:** While smoking brakes a *la Steve McQueen and "Bullit"* does sound sorta' cool, it's actually a very dangerous condition. Overheated brakes or brakes that are smoking means the brake pads have been burned (you may notice an acrid, burning smell) or something is leaking onto the brakes. If this happens, the pads will develop a glaze which can severely affect your stopping distance. I understand that if axle seals are leaking onto the brakes, it will ruin the brake pads and rotors too. Read \$\$\$\$\$.
- **Brake light:** If the brake light (or ANY light for that matter) on your dash illuminates, it can indicate a serious issue. In most cases it probably means a problem with the hydraulics and the car should be inspected and repaired as soon as possible. It is never safe to drive if the brake light is illuminated, okay? (The light also doubles duty to let you know the parking brake is left on in some cars.)
- **Faulty or collapsed hoses:** A collapsed or malfunctioning brake hose can result in calipers that move unevenly. This will cause the car pull to one side when the brakes are applied. If the brakes are pulling to one side, the car should be inspected and repaired as soon as possible. Sometimes the fluid pressure to the caliper will not be released by the faulty hose and will keep the caliper applied. Tip: If you wanna' be cool, get a set of stainless steel brake lines (hoses). Stainless steel lines provide a number of benefits as compared to OEM rubber brake hoses. They provide excellent protection from roadway debris, they reduce expansion during pressurization and they give you the cool race car look. (I have Goodridge-brand, red, braided stainless steel ones ☺).
- **Emergency brake on:** This may seem silly but it can happen. It is pretty easy to forget to release the emergency brake and this will cause acceleration performance issues as well as damage to the brake system. If the car seems to be accelerating slowly or you hear a squealing or grinding noise, check to make sure the parking brake is not engaged. If the parking brake cable seizes after being set and you try to release it that can cause the car to not be moved at all. ☹

IMPORTANT: Brake Fluid: Your entire brake fluid system should be flushed and totally replaced at least every two years. Why? Glycol-based brake fluid starts to absorb moisture from the moment it's put in the system. The fluid attracts moisture through microscopic pores in rubber hoses, past seals and exposure to the air especially where humidity is high. Water in the brake lines lowers the boiling point of the fluid so stopping ability can diminish in hard stops as heat in the system increases. In addition, over time the moisture can cause internal corrosion in the brake lines, calipers, master cylinder and other components. Brake fluid is stored in the master brake cylinder reservoir, a translucent plastic container on top of the master cylinder in the engine compartment. This allows you to see the fluid level inside without having to remove the filler cap when you check the fluid level. Opening the cap unnecessarily should be avoided because it allows moist air to enter the reservoir. Be careful adding extra brake fluid to the reservoir if the level is low as it is highly corrosive to the paint finish. By the way, clutch fluid is the same as brake fluid; brake fluid is used both in hydraulic brake and hydraulic clutch.

In summation, your brakes require serious maintenance attention for obvious reasons. Check your brake fluid level under the hood monthly and attend to any brake problems you may have as soon as possible. If you take good care of your Miata, it will take good care of YOU!

Zoom Zoom Safely!

Gail

DISCLAIMER

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