WHOA THERE!

Boy is it fun having a Mustang that accelerates from zero to 60 in a matter of seconds and goes around corners like a roller coaster, but if you don't have enough "whoa for the go," then the end to your thrill ride will be less than impressive.

Let's look at brake systems and start with a brief component description. We'll focus on late model Mustangs, which have front and rear brakes in a disc brake design versus drum brakes. A brake system may consist of the following components:

- **A brake pedal and lever (the pieces that your foot presses on the inside of the car)**
- **Fluid reservoir (the item each of us checks daily to ensure we have fluid)**
- **Fluid**
- **Master cylinder (the "pump" providing pressure to the system when you press on the brake pedal), hard brake lines (lines that are made of metal and carry brake fluid through the vehicle)**
- **Metering block (proportions the brake fluid between the front and rear brakes)**
- **ABS (Automatic Braking System on most late-model Mustangs which "pulses" the brakes if the wheels lock up during extreme braking or braking on slippery surfaces)**
- **Flexible lines (lines that connect calipers to the metal brake lines)**
- **Calipers (the "clamp" that applies the pressure to the rotor as you press the brake pedal)**
- **Brackets (hold the caliper to the knuckle or axle)**
- **Pads (the sacrificial material pressed against the rotor during a braking event)**
- **Rotors (the cast metal disc that the pad presses against during a braking event)**

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So why change or modify the brake system? For a couple of reasons—first, to enhance the car's performance look and second, to enhance the actual performance of the car's brake system. Adding big, colorful calipers and big, slotted or cross-drilled rotors add a "performance look" to a car, even when it is standing still. If a performance look is what you want, then bigger is better; go with the package that looks coolest to you.

If performance is desired, then bigger brakes don't always mean better. Brakes add un-sprung mass to your car's chassis and we want to minimize mass for optimized performance. Key brake performance components are brake pads, fluid, pad to rotor surface area and heat management. (Notice I did not say big, huge calipers and big, huge rotors!) Most cars are equipped with more brake capability than a customer ever requires.

MRT has been highly successful in competitive road racing with Cobra, Bullitt, and Mach 1 stock rotors and calipers. We change other components in the brake system and optimize the system performance without adding weight. To be clear, the performance aftermarket brake systems typically work better because they have increased clamping capability, increased surface area between the pad and rotor, increased rotor mass and cooling capability, and often look smokin' cool, too.

Rotors are probably the first brake component a customer changes in a brake system since rotors and pads are the two primary wear components in your brake system. As a rotor wears, it can warp or get hot spots that cause a car to shudder or pulse when the brakes are applied. When this occurs, it's time to replace the rotors! A lot of customers are replacing worn rotors with slotted or crossed-drilled aftermarket rotors which enhance the brake system's appearance and performance. Many people ask why rotors have slots or holes—the easy answer is "because it looks cool."

Another answer is based on experience from years ago when the race industry struggled with rotor failure (overheating, warping, cracking, or trapping gasses between the pad and rotor) during extreme driving events (a.k.a. racing). Brake pads produce a dust and release a small amount of gas when they are worked hard and get hot. If the dust and gas build up between the pad and rotor, brakes lose their ability to slow the car. The race industry experimented with several designs to address this issue and drilling holes in the rotors increased the rotor surface area for cooling and gave a place for the gasses to dissipate during extreme braking. The problem with drilled rotors is that they will ultimately crack—starting at the edge of the hole—causing premature failure of the rotor. A more popular way to get the same racing look is to dimple the rotors in either a slot pattern or a hole. Dimpling seems to be the best of both worlds; you get the performance look, extreme braking feature and a more durable, longer lasting rotor.

In the end, changing the brake system is driven by appearance gains or racing performance gains. The critical end result is a system capable of stopping the car in a safe, efficient manner—and looking good while doing it. Not a bad result!

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