Brakes and Heat

Heat generated from friction between the pad and the rotor have a tremendous influence on the performance of the brake system. Understanding how the brakes react to heat can help the brakes work their best in all conditions.

- Every brake has a sweet spot in its temperature range where it will work its best. Select a rotor that keeps the brake at the right temperature as much as possible. For downhill race bikes, 203mm rotors help keeps the brakes from overheating. On dirt jumping bikes, 160mm rotors can help keep the brakes hot enough to work their best. Saint M810 brakes have a hotter sweet spot than other brakes.
- Rotor size has the largest effect on the stopping power of the brakes. With four rotor size choices on Shimano brakes, you can custom tune your bike to have just the right amount of power.
- While some heat is good, brakes always have to battle overheating. Heat is transferred from the rotor and pad through the piston to the brake caliper. Shimano uses insulated pistons to keep the caliper as cool as possible.
- Center Lock rotor spiders act like fans, cooling off the caliper even more.
- XTR brake pads have titanium backing plates which dissipate heat more effectively than the standard steel ones do.
- Brake fade occurs when the pads and rotors get too hot. The pads simply lose their ability to grip the rotor and the brakes feel like they are losing power.
- Vapor lock occurs when the caliper gets too hot. The little bit of moisture in the brake lines will boil and become compressible. This will allow the lever to come closer to the bar during braking. In some cases the lever can even come all the way to the bar. Pumping the lever compresses the bubbles enough to make the brakes function again. When the brakes cool off, they will function normally again with no lasting ill effects.
- If a rotor becomes badly overheated, it can glaze over. It will become discolored when this happens having almost a rainbow appearance.
- Once the rotor is glazed, it will never function as good as it can. There is no way to save a glazed rotor, it must be replaced.
- Even though the pads were not likely damaged by the heat, it is always a good idea to replace the pads when the rotor is replaced.