

10 THINGS YOU NEED TO KNOW ABOUT MUFFLER PACKING

That you won't learn anywhere else

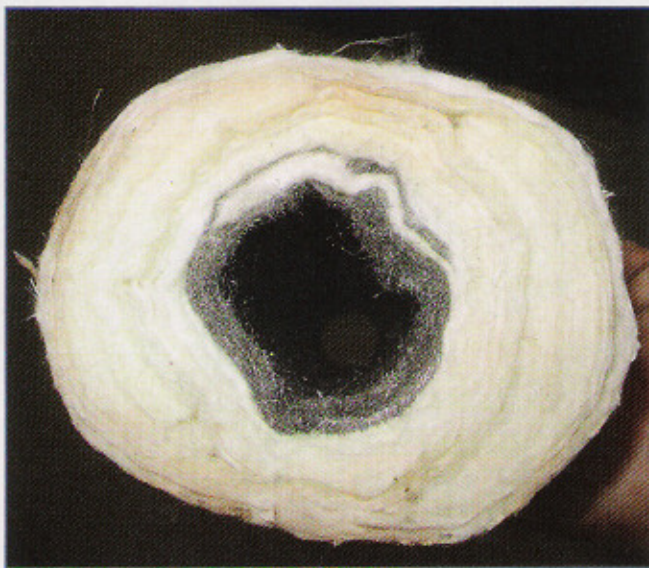
(1) Recent studies reported that fresh muffler packing can produce an almost two horsepower gain (from 7000 to 8000 rpm) over a worn-out muffler. A blown muffler will also cause a drastic loss of low-end response.

(2) Every factory team relies on its exhaust supplier to handle their muffler repacking through muffler rotation on a race-to-race basis. The teams have four or more mufflers in reserve for each race bike. They take all of them to the sound test area. Additionally, they weigh their mufflers before every race to insure that they are fully packed.

(3) Contrary to what you may think, muffler packing blows out from front to back. The first place to lose packing is where the muffler canister meets the mid-pipe. This is caused by the increased turbulence where the pipe enters into the large chamber. It should be noted that as turbulence increases, so does the back pressure against the exhaust valve. Excessive back pressure reduces scavenging, which prevents fresh fuel from entering the cylinder. Low-to-mid throttle response suffers the most, and smaller displacement engines will fall flat sooner. With continued use, a worn-out muffler can turn brown from the excessive heat. As the muffler canister heats up, the fiber becomes more brittle and fractures at a faster rate.

(4) Muffler packing is made of thousands of tiny fibers, all of which vibrate with each sound pressure wave. Like bending a paper clip back and forth, these fibers reach a point where they break under stress. When the fiber is short enough to work its way through the core's perforations, the exhaust pulls the available fiber into the stream and out the muffler. It goes out as fibrous dust and is breathed in by the rider behind you.

(5) The AMA sound limit for 2008 is 98 decibels. In 2010, it will drop down to the same 96 decibel limit that the FIM requires for international competition. The FIM's 96 dB sound limit, however, is identical to the AMA's old 99 dB limit. How can that be? The FIM does their 96 dB sound test at a lower rpm than



the AMA's 99 dB test. The exception to this rule is that under FIM rules, some bikes are tested at the same rpm levels as the AMA, but it is typically big-bore bikes, like the YZ450F, and they are tested at around 4800 rpm (where the bike is rarely ridden).

(6) Aftermarket mufflers tend to have threaded fasteners on one end cap so the canister can be repacked. Many production mufflers rely on rivets at both ends. Mufflers designed with rigid mounting brackets on their shells tend to be easier to disassemble. Those that mount with a P-clamp-

style-band that wraps around the muffler are more difficult to handle and more time-consuming to take apart.

(7) Although mufflers look like they are packed with home insulation fiberglass, you can't use fiberglass batting from Home Depot. It isn't suited to the high temperatures that four-strokes produce. Real muffler packing has to use material that retains its strength and flexibility in the 1200°F-plus environments that are created by high-compression race engines.

(8) There are four types of aftermarket muffler packing available: **1.** Continuous bulk fiber. **2.** Fiberglass mats. **3.** Steel wool. **4.** Pre-formed glass or glass/steel pillows. All types will restore a muffler back to its original performance level. Steel wool packing and pre-formed pillows can cost up to twice as much as the loose fiberglass type. Fiberglass mats are the least durable, while the pre-formed pillow type is the easiest to handle and install. Bulk packing is, as you would expect, the most time-consuming.

(9) It's important to leave no unpacked voids in the muffler. Pack it tight. Always inspect the muffler core for weld fractures during a rebuild.

(10) Here are some tips to make your muffler packing last longer. Always use a rubber muffler plug when washing your bike. Seal the end-caps with silicone rated for at least 400°F to prevent water from entering the muffler. The correct jetting will help maximize packing life. A bike that is too lean will produce excessive heat, which will damage the packing. □