

A Magnesium Crankcase Repair

By Rob VanMullekom

I work here at Gougeon Brothers, Inc. as Operation Supervisor in the epoxy department where we do production mixing, assembly, packaging and quality control of the epoxy products. A lot of the guys I work with here ride motorcycles. In talking with these guys, I found out that it is not uncommon to punch a hole in the ignition housing cover. In fact, that's what happened to my bike.

The ignition cover of my off-road motorcycle is a magnesium casting. The casting is not heavily stressed but does have to hold the hot (about 140°F) oil that lubricates the engine. When I realized it cost \$160 to replace the cover, I started thinking of the alternatives like, "how about using this epoxy we make for the repair and save some cash?"

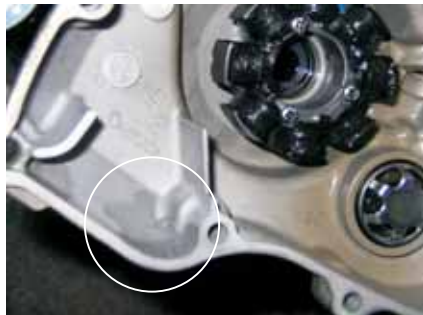
After asking around a little, I came up with an approach. Now after completing the task and finding that the repair is working fine, I thought I'd share my process of how to fix a punctured metal casting.

There were too many wire and cable connections so, rather than disconnect these, I chose to do the repair with the cover in suite. After draining the oil, I cleaned all surfaces with acetone. Then I abraded the surfaces of the magnesium with



▲ The holed ignition cover is off the bike, but still connected to it.

▼ The repaired cover showing the repair area from the inside.



a Dremmel™ Tool, to knock off the burs. Crankcases are made of other materials; aluminum and steel and I think the same strategies would work as well. I figured a rivet-like casting of epoxy would hold best. So I wanted the epoxy thick enough so it wouldn't run out.

I chose Six10® mixed with a little 420 Aluminum Powder because it will not sag and also is toughened a little so it will tolerate the vibrations that the whole motorcycle is exposed to. I didn't need enough to use the static mixer so I simply dispensed some into a small plastic container and stirred it. This material is thin when moving but thickens, or gels, when at rest. So it was easy to work into the void and flow about the inside to form my vision of a rivet. I smoothed over the outside and allowed it to cure for 24 hours before I filled the case with oil.

When I'm done riding the bike I put it in the garage with a paper towel under the repair so I can easily note if there are any leaks. Since the repair, I've ridden about 16 hours and have had no leaks. ■