

## LAP 15 — PROACTIVE MAINTENANCE

**T**here is a very good saying in business, "Bad news early is better than bad news late," and the same holds true in racing. Lose an axle at high speed, break a spindle in a turn, or blow an engine at high RPM and the consequences can be both expensive and severe. Race cars are like helicopters, "a loose collection of parts flying in close formation" and it's your job to keep them together. The best and least expensive way to accomplish this is to get proactive on your maintenance. I'm not talking about the obvious things like changing engine oil, replacing brakes and repairing the obvious, I'm talking about taking things apart that are working fine and inspecting them for potential failures before they occur. If you've ever visited a real race shop it's unlikely you saw a completely assembled car anywhere because they were likely in various stages of disassembly due to a proactive maintenance program.

If you race and have never blown a head gasket on your Mustang, face it, you will, unless you change it first. Head gaskets are subjected to tremendous thermal and cyclical loading which will, in time, result in failure. Just accept it and move on. The good news is stock head gaskets work just fine in high compression applications provided the deck is flat and the gaskets are regularly changed. If you race seriously, change them every year. If you open track your Mustang a few weekends a year changing them once every two years should be fine. If you overheat the car, don't wait too long before changing them. We're not talking about street duty here—the track is no place to be changing a head gasket. Believe me, several months ago we changed one on a friend's vintage Shelby Mustang at a race event in a driving rainstorm, it was not fun at all.

Next on the hit parade are valve springs, they get weak and cause all sorts of problems. If you have a spring rate checker you're ahead of the game, if you don't, get one and use it. The idea is to identify a weak spring before it causes other problems by letting a valve contact a piston. When that happens it is often found through failures of pushrods, valve locks, retainers, rocker arms or rocker arm studs. Many valve train component failures can be traced to weak valve springs. In fact, one of my motors is apart right now for preventative maintenance. I found I could barely see the impression of the exhaust valve in the carbon on top of the piston in the #8 cylinder. Yup, weak valve spring, I was lucky to catch it in time. You can too.

Road racing a Mustang means you're abusing the transmission. Count the hard shifts made in just one lap and compare that to the three made in one trip down the quarter mile. When compared to a drag raced car, your road race Mustang sees years of use in a typical weekend. All those shifts and make them all perfectly right? The rotating components inside a transmission are subject to vibration, fatigue, and shock loading which makes things crack in the most unlikely of places. Use a surface NDE (non-destructive examination) technique to check input and output shafts for cracks and look closely at blocker rings and synchronizers for obvious wear. Check the cluster gear closely too, as it is used in every gear except fourth. Input shaft bearings are probably the most

common failure so check yours closely for wear and make sure it fits tightly in the case, as they are known to spin under high load.

While you're in there go ahead and remove the clutch and flywheel. Inspect both sides of the flywheel and the pressure plate for cracks. Look closely at the pressure plate, looking for cracks near the mounting bolt flanges. Look closely, because sometimes your eyes just don't pick up the obvious failures. I had a pressure plate crack in three places once and I didn't even notice it until the fresh eyes of a friend pointed it out!

Simply put, catastrophic brake failure is bad and must be avoided. The good news is, it's rare. Having confidence in your brakes is the best way to go really fast. Usually, he who brakes last, wins. Routinely checking the flexible lines in your system is a good idea. Pay special attention to the rear flex line since its proximity to the hot exhaust exposes it to higher than normal heat which can cause accelerated degradation. If you have cooling ducts on the front brakes look closely for wear between the flexible line and ducts. Watch your hard lines too, paying special attention to mounting points looking for kinks, rubbing and erosion. Trace the hard line in the tunnel inspecting for impacts from stones and road debris. It's also a good idea to remove your brake pads and inspect them for de-lamination and cracks. Have a close look at those rotors too, paying special attention looking for circumferential cracks where the rotor meets the hub.

On a track, the loads seen by the suspension pivots are much greater than seen on the street. This means "normal" service life is greatly reduced and the odds of failure are much higher than normal. Like brakes, a suspension failure can be catastrophic so all possible steps should be taken to avoid it. Disassembly and inspection for cracks, wear, and loose bushings is extremely important. A common failure point is the inner pivot where the lower control arms attach to the body. In a stock setup, the bushings are press fit into the lower control arm. Look for looseness between the bushing and the control arm where the steel case of the bushing sides freely in and out of the control arm. Most people look at the rubber in the bushing and pronounce it ok. Insert a screwdriver up there and pry the control arm fore and aft looking for the bushing to slide within the control arm. You might be surprised.

Now get out in that garage and get that Mustang back together so you can get out on the track!

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