

Technical Note - Rough Running Riviera Rectified

Some time back I noticed that my 1972 Riviera 455 engine would occasionally hesitate when idling. The idling became progressively worse and the Riv started to conk out at inappropriate times. At off-idle speeds the engine still ran well and would cruise all day, not missing a beat, so I put up with the idle problem. It was another thing added to my bucket list of things to do sometime.

Late last year I fitted electric thermo fans to the Riv to alleviate overheating. This was the last straw as far as the idling problem was concerned. With the engine hot and the thermo fans operating the engine would start easily enough but would stall when put in gear (it's an automatic). Even turning the power steering when the engine was idling was enough to cause the engine to stall. It was time to sort out the idling problem.

My first step was to check the ignition system. Many years ago I installed an aftermarket breakerless ignition unit. It replaced the points and condenser, but used the original coil, ballast and distributor. It worked well, overcoming the usual problems associated with the original points. Lois and I drove the Riv to Queensland for the 2008 National and the breakerless ignition didn't miss a beat. All seemed to be working fine here, with the high tension leads reading the right resistance and a healthy spark at idle.

I turned now to look for a vacuum leak. A gauge showed that the manifold vacuum sat steady on an acceptable 17 inches. The cylinder compression was a healthy 140 ± 5 psi. I checked out all the vacuum hoses, including the PCV and EGR systems, brake booster and transmission modulator. I looked for a leak in the intake manifold gasket as best I could without removing it. All OK here.

Next I had the Rochester four-barrel overhauled, but to no avail. The only way I could make the engine idle without stalling in gear was to back out the carby idle mixture screws $3 \frac{1}{2}$ turns, making the idling mixture over-rich. An exhaust gas analyser showed that the air-fuel mixture of around 11 was required to make it idle smoothly (should have been around 14). With the idle screws out 2 turns, which is about where they should normally be, the engine would simply not idle properly, if at all.

With the idle screws out $3 \frac{1}{2}$ turns, I played around with the ignition timing, with inconclusive outcomes. At 8° advance, the engine would idle smoothly out of gear, but rough as bags in gear. With 12° advance the engine would idle smoothly in gear, but rough as out of gear. Figure that one out!

So before ripping off the intake manifold to see what might be going on underneath where I could not see, I decided to replace the breakerless ignition with the original points, just to be sure, and – bingo – problem fixed! I had just confirmed the golden rule of engine troubleshooting – the first three things to check are ignition system, ignition system and then ignition system!

The breakerless ignition unit I used was the Hall Effect type (no connection with Brian and Linda). The literature tells us that this type of ignition unit is widely used and generally regarded as reliable. Troubleshooting includes ensuring that the Hall Effect sensor device and the vanes that bolt to the distributor rotor have good ground connections, or even using an oscilloscope to observe the voltage waveforms. As far as I am concerned, all that is academic, as the breakerless ignition now resides at the bottom of my garbage bin, and I am a dedicated follower of points.

By the way, the Riv electric thermo fans work a treat – maybe I will include a future article on these on my bucket list!

Alan Haime (WA Buicks)