

Fourteen Missing Steps to Success

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Having played around for nearly 12 years with old cars, concentrating on Cadillacs, a person, such as myself, begins to feel rather complacent about how this or that works or what goes where.

No matter how many engines one has been into, there can always be surprises, and here's the winner!

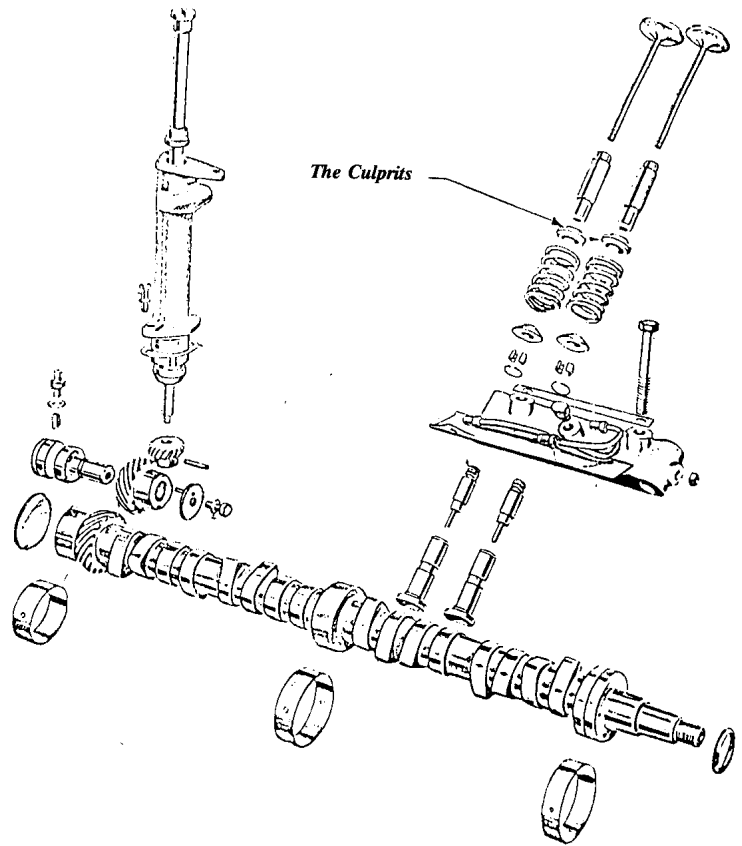
A year ago, Keith Smith and a top-notch mechanic in this area set out to rebuild a 1946 Cadillac engine to drop in place of the weary mill in his 41-75 Cadillac. The plan was to have everything done in time for the Classic Caravan last August. He did the job the only right way; broke down the block to a bare casting, degreased it, rebored it, had the crankshaft re-ground, replaced every bearing in the engine, had the cam re-ground, bought a new timing chain, pistons—the works...then had all of this balanced before assembly.

The engine was put into the car and started. Unquestionably, it was the worst, the roughest running engine that we had ever seen. Timing and carburetion were adjusted to no avail. Now, the fun began. Out came the '46 engine, back in went the original engine—it was late in July—the week of the riots in Detroit. All that week we labored over the sick mill, changing this, that, and the other. The trouble seemed to point to valve timing—again and again. But, when you exhaust every possibility, as we had done, you're willing to blame everything—or anyone, for the trouble. As the engine ran, gas vapor would be blown out of the carburetor air horn, some cylinders would fire, others would not. The whole mess followed no pattern—the working cylinders were not all from the same branch of the intake manifold; there was reasonable compression on all 8 cylinders; all cylinders were receiving ignition voltage—still, the engine fought itself as it ran...so roughly that it very nearly threw itself out of the cradle-like stand we use for these tests.

We tried another engine shop—no time to really dig into the problem, so Keith took it to another. The report was that the pistons and rings had been fitted too snugly...? whatever that had to do with it? So, this shop went through the identical ritual that Keith and I had, still with the same sick engine as a reward.

Now, however, as our third man checked valve stem lengths, he found that a few of them were too long—not by much, but a hair too long, nonetheless. He took them out, ground off the ends, to length, and proceeded to install them again. Two of the springs felt stiff enough, but most of the rest were soft enough to open the valves with finger pressure. What could this mean in terms of lifter pressure...? Well, assume $\frac{1}{4}$ of a square inch plunger area with 30 psi oil pressure on it means $7\frac{1}{2}$ lb. force exerted on the valve spring. If the springs were mushy enough, the lifter could open the valve of its own pressure! A closer look showed that there were flanged valve spring seats up at the valve guides for two springs, and none for the other 14.

These upper spring seats (*see illustration*) had fallen away in the degreasing tank—all but two of them. They're still available from Cadillac, so I ordered a set of 14 for Keith, and when they were put in, and the engine buttoned up, it became the sweetest running thing that ever there was!



In viewing this thing in retrospect, how did it happen that none of us even were aware of the existence of these spring seats—considering all of the valve jobs that I've done on these engines.? None of the other engines had been cleaned, and sludge holds the spring seats up in there like glue...! The whole thing is laughable now, but it wasn't earlier this year. My personal gain was first, of frustration, second, experience, and third, Keith and I prepared the engine from my 41-60S for the same major rebuild, and now it's finished. This was to be a backup in case his would not be ready. But, as sort of a happy ending, his 41-75 will have the new engine for the Caravan, and at long last, my 41-60S will have a decent engine in it.