Testing the injectors

For my next test I tried an 'injector balance test'. The tool I used was an injector actuating tool, which has three settings (10-30-100 millisecond) and for this test you need to connect the fuel pressure gauge, disconnect the harness for all the injectors and connect the actuating tool.

On this occasion I used the scan tool to prime the pump, although recycling the ignition key will do. The test showed injector #1 dropped in pressure by 10 PSI, which is my benchmark. Injector #2 was 10 PSI, injector #3 showed a drop of 9 PSI and injector # 4 showed a drop of 6 PSI. It was here that I found the cause of the problem.

This test supports the drivability problem, which is due to uneven fuel delivery, as it should be even across all cylinders with the manufacturer stating that a difference of 1.5 pounds is acceptable. In this case injector #4 was definitely faulty while #3 was on its way out. I recommended replacing both #3 and #4 to the customer, who agreed. The injectors were subsequently replaced and the performance of the vehicle was restored.

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We then carried out a further test drive to confirm that the repairs made were correct. This is a typical example of an ecotec engine with multiple problems – cam sensor failures are all too common and it is clearly something that caught the previous two garages out. There are at least three variants to this engine or system design and they share similar problems. The original cam sensor had probably failed and a replacement aftermarket part – which was not compatible with the system – only made matters worse.

It's important that the test drive, symptoms, information and a correct procedure are put into place. In my opinion, a scan tool wouldn't have proved very helpful in this particular case; in fact using trouble codes to 'diagnose' the problem is what caused the previous garages to run into trouble in the first place.

For this reason I believe a quality scope (in my case, the Pico 4000) is a must-have tool as it helped to verify cam and crank correlation and that the cam signals weren't correct. The other key here was the correct information from the supplier.

The injector actuating tool also proved invaluable, as it took me ten minutes to check all four injectors and to conclude my repair.