Frank Massey, Autoinform

A Citroën Relay on and off again

A second-hand engine, a replacement gear box, and a new EGR valve and probably even more to consider. Autoinform's Frank Massey describes a Citroën Relay with some interesting problems, and the clues and fixes that eventually put the Relay back on the road for good.

The Relay's owner specialised in transporting vehicles across the country, and offered to drive the vehicle to our garage. The vehicle didn't quite make the journey, such was it's condition. Upon arrival, a quick serial scan reported faults with the number 1 injector, plus a turbo boost negative boost deviation.

A quick test drive revealed a badly misfiring engine and no turbo boost. The next process was to subject the charge pressure circuit to a smoke test. We modified our red line tester some time ago, in order to fully pressurise intercooler systems, most diesels operate with 1.4 bar of boost. However, in this case there was no need for such pressure as the leak was very evident. A steel hose from the EGR valve to the inlet manifold was leaking badly.

The evidence so far suggested a loss of boost to be a simple system leak, and until repaired no further tests were possible. The badly missing engine could however be due to several causes, such as a fuelling error, a mechanical error, either internal or an ancillary component, such as the EGR valve. The symptoms, plus the hard DTC error relating to the number 1 injector, was a sensible place to start.

All the injectors were removed for a comprehensive bench test, this revealed one injector electrically faulty, and one injector hydraulically faulty. The remaining two injectors passed all bench tests and were to be refitted. Two genuine new injectors were fitted after recutting the compression seats.

The customer expressed some doubt over a genuine EGR having been fitted. The next task involved removing the whole EGR assembly. It was clear from the poor assembly, that many of the problems could have been man-made when the engine and gear box were fitted. Coolant hoses, wiring loom and intercooler hoses were not run or clipped correctly.

The EGR transfer hose to the inlet manifold was loose and no seal had been fitted. Confident with the findings so far, the reassembly went smoothly. The engine started promptly on 4 cylinders, with no smoke or excessive diesel knock, as is common with combustion related problems.

Having cleared the DTCs, our next task was to log key data relating to turbo boost, EGR feedback, and injector smooth running balance. All of which proved normal. In fact the vehicle performance was remarkable.

A week after returning the vehicle, and following several hundred miles of use, the customer complained of diesel knock and a flat spot, but only when the engine was cold. We discussed the options and symptoms, agreeing to replace the two remaining injectors. I carried this work out at his home, and agreed that the diesel combustion noise when cold was reduced, a test drive also confirmed no flat spot.

Some three weeks later, yet another call from the owner, describing what sounded like serious problems: lumpy engine, smoking and lack of power. Confident of my work so far, I suggested the sensible option of transporting it back to our workshop. Upon receipt, the only problem we discovered was a slight air leak from the plastic filter housing. As this was a suction system, a lack of fuel and cavitation would cause severe running problems. A complete new housing was fitted and fully tested with our ADS low pressure gauge. The guage confirmed a perfect seal, and the status of the high pressure pump's ability to create a pressure differential across the filter housing.

With wisdom in mind, we decided to keep the vehicle over an extended test drive. After several days and some 150 miles of faultless performance the exact symptoms described by the owner occurred.

The only clue was excessive diesel knock and smoking. With no additional DTCs, this had to be a fuelling combustion problem. While consulting Autodata wiring schematics for this Relay, my next suspicion was a faulty rail pressure signal or intermittent HP pump internal error. Reflecting on exactly how and when the problem occurred, it transpired following the passing of a speed bump. Examining the wiring to the rail pressure sensor and pump volume valve exposed a wiring conflict with a metal support bracket.

So a lengthy series of problems with remarkably similar symptoms, a grateful and understanding owner, all resulting in a satisfying end.

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