

Touareg cranks and sort of starts

A trade customer contacted our garage, in relation to a problem vehicle that they had come to the end of their diagnostic capabilities. The information we were given was that the 2010 Volkswagen Touareg V6, broke down while driving and was towed to their workshop. Their assessment was that the vehicle did run, but only barely. The six injectors were removed and sent off for testing. The test results of the injectors found them to be faulty.

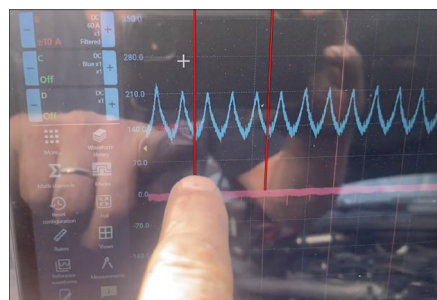
The workshop fitted 6 reconditioned injectors, a new high pressure fuel pump and a new timing belt. This work, although needed, did not resolve the issue. The Touareg was still just barely running. At this stage, we were contacted and asked to take a look, to see if we could shed some light on what the root problem was.

We found several interesting fault codes stored in our initial scan. These included glow plug and intake runner motor fault codes. These faults were due to the previous workshop's work, and there was still nothing obvious about what the actual issue was.

We cranked the engine over, listening carefully to see if the engine itself sounded ok.

When the vehicle was running it sounded irregular and very rough, yet it did not sound like it had a misfiring cylinder. We looked at all relevant data PIDs that could cause these types of issues, and again nothing seemed very much out of place.

We next thought of an actual mechanical failure, such as the timing chain. We carried out a relative compression test, which at first glance looked perfect. There were nice even peak amperage levels being drawn by the starter motor for each cylinder. On closer inspection, we noticed there were only three compression humps in two rotations (720 degrees) of this engine. This was a V6 engine, so there should have been 6. There was no compression on one bank. The firing order of the engine was 1-4-3-6-2-5. We had no compression on 4, 5, or 6. The bad cylinders were all located on the left bank, and were every other position in the firing order.



A scope trace on engine cranking showed only 3 compression strokes on this 6 cylinder engine (between red lines is two rotations)

We explained our findings to the customer, stating more diagnosing time would be required to get to the bottom of this problem. We advised that the most likely cause of the loss of compression on the left hand bank was due to a timing belt failure.



**Peter Kennedy,
Kennedy's Garage**

On disassembly of the engine, we found the timing chain was in a good state of repair. It was most likely replaced a couple of years previously. We carried on disassembling, and removed the left bank rocker cover. Once the rocker cover was removed, we were finally able to see something was off. The camshaft lobes had rotated on the intake camshaft. Once the camshaft was removed and compared to a new one, the issue was even more visible. All of the intake lobes had rotated around 90 degrees. We fitted a new camshaft, and reassembled the engine. It was back up and running in no time, much to our relief.



When compared to a new camshaft, the old cams were noticeably out of position

The question you have to ask is this: How did this happen? After discussing our findings with the previous garage, we concluded that injectors number 4,5 or 6 had failed badly. This possibly caused a hydrolock situation in one of the left hand bank cylinders. This would have put the intake valves under immense pressure when they were meant to be opening, causing the intake lobes or pulley to rotate on the camshaft axis.

The conclusion was a positive one and it is also very satisfying. As in every day in the life of a garage, you keep learning!

Scan the QR code to view part 1 of this 2 part video of this diagnosis and repair on Kennedy's Garage YouTube channel.

