



Eure!Car Tech Blog highlights

The Eure!Tech Blog covers problems that mechanics are facing every day. The Blog, which is updated regularly, can be read at www.euretechblog.ie. Here is a sample of a recent post.

This new post discusses the details of a common failure in VAG TSi engines, timing chain stretch and/or loss of crank/camshaft synchronisation.

Symptom

A clanking sound when starting, or difficulty starting are evidence of this failure.

Depending on its severity, the engine failure lamp may stay permanently lit.

If stored error codes are read, the following recorded failure may be detected: P3008 - Camshaft Position Sensor G40 - Signal outside tolerance.

More errors may be stored due to this condition.

Possible Causes

With the symptoms described, the two main reasons may be:

- Camshaft sensor in bad condition.
- Loss of synchronisation between the crankshaft sprocket and the camshafts.

Diagnosis and Repair

If there aren't any clanking sounds on startup but starting is difficult, it is advisable to check the correct operation of the camshaft position sensor; located on top of the cylinder head. The sensor is a hall sensor with a three-wire connector:

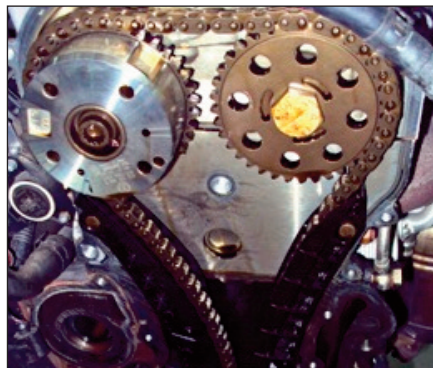
- PIN 1: 5V power from the ECU
- PIN 2: Signal (varies from 2.5-5.0 Volts)
- PIN 3: Ground

If the camshaft position sensor is in good condition and the signal is correct, a mechanical fault may be present.

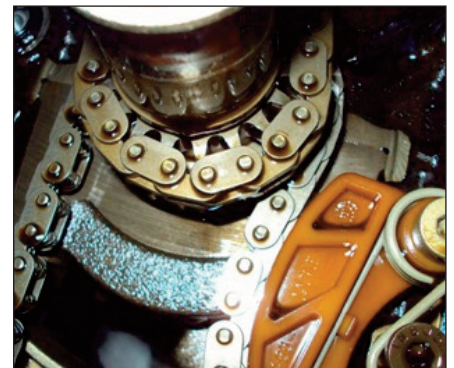
The problem may be caused by the stretching of the timing chain, or even loss of synchronisation, which it is caused by a mechanical failure of the chain tensioner.

When the engine stops, the tensioner loses oil pressure, leaving the timing chain slack at the bottom of the crankshaft. When restarting, a lack of synchronisation with the camshafts may occur.

In extreme cases, when starting the engine, the crankshaft sprocket may rotate without pulling the chain, causing major



Slack timing chain between the camshafts



Slack timing chain at the crankshaft sprocket

engine damage.

Check the cylinder compression. The maximum permissible difference between cylinders is 3 bar. This test will approximately reveal the severity of any damage. Significant variation in cylinder compression may require the removal of the cylinder head in order to inspect and repair the damaged items.

If the compression values are within tolerances, remove the oil sump and the timing cover to check the state of the chain.

Timing Chain Replacement

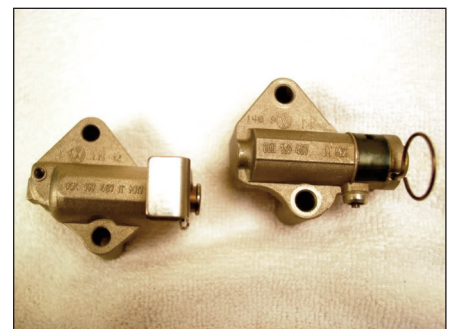
If the chain needs replacing, use a complete timing chain kit with a new hydraulic tensioner. Ensure that the modified model is installed. The two hydraulic tensioners are shown to the right on this page. Check for any other damage that may have occurred inside the engine. Loose or broken parts may have caused other damage that may have to be repaired.

Replace the oil and oil filter. For this type of engine, only oils of the following qualities are appropriate:

- QG 1 - Long duration oils "Long-life - 5W30
- Qg 0 - Synthetic fixed interval oils - 5W40

Advice and Prevention

Possible causes for this type of failure, other than mechanical failure of the chain tensioner, as described, may be related to the servicing interval (oil change) and oil quality.



Hydraulic tensioners, the old design (on right) and modified (on left)

To reduce the chance of this type of failure, the following is recommended:

- Replace the oil and filter at intervals specified by the manufacturer.
- Use the oil that meets or exceeds the manufacturer's recommendations.

Replace the tensioner of the timing chain every 60,000km and make sure that the modified tensioner is part of the timing chain kit.

If the customer hears a metallic clanking when starting the engine, it is advisable to consider this as an indication of this failure and take action to prevent any damage beyond what has already occurred.