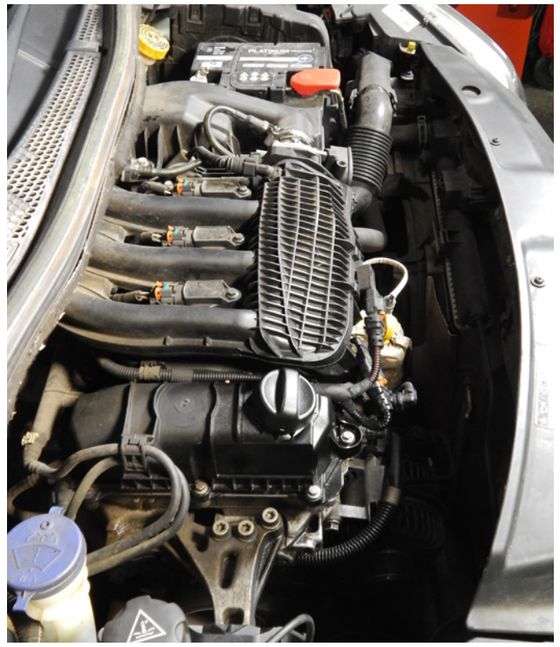
1.2 PureTech
Wet Timing Belt Replacement



A number of vehicle manufacturers are now using timing belts immersed in oil, which are narrower and require less operating space. This efficient and quieter drive alternative to the traditional ‘dry’ belt results in the reduction of friction losses, fuel consumption and exhaust emissions. The oil dampens any vibrations that occur and the engine runs evenly and more smoothly - whilst using more environmentally-friendly technology - making driving a pleasant experience.

However, due to rapid degrading of the engine oil in vehicles used in an urban environment (because of low mileage/vehicles not reaching operating temperature), it is reported that there are numerous issues with the 3-cylinder, 1.2 PureTech engine - which uses a ‘wet’ timing belt and is fitted to many Peugeot and Citroen models. The timing belt material is subjected to wear and can deteriorate.

Since the introduction of this engine, the recommended interval for the timing belt replacement has been amended subject to when the vehicle was manufactured. Peugeot and Citroen have also issued several technical service bulletins relating to this issue, including: the worn belt material mixing with the oil and affecting the oil pump strainer, and the variable timing solenoid valves and vacuum pump causing a number of issues (depending on the amount of belt material the engine has ingested).

The vehicle featured in this article is a 2013 Peugeot 208, fitted with the naturally-aspirated version of this engine. It was due its first timing belt replacement at 112,500 miles (180,000 km) and there were no other issues reported by the owner.

Before starting any timing belt replacement, it is essential that the vehicle manufacturer’s repair procedures are precisely followed. The engine should be at an ambient temperature and any special tools should be acquired in advance. It is also worth checking for any engine management fault codes that can be affected by belt material and relate to any of the components listed.

Timing Belt Replacement Procedure

With the vehicle raised, the right front wheel and wheel arch liner was removed to gain access to the auxiliary drive belts. The vehicle was raised further, the engine oil was drained, and the filter was replaced.

Lowering the vehicle, working from the top of the engine, the air filter housing was removed (taking note of the position of any of the pipes and wiring connectors) for reassembly. The three ignition coils were removed and several hidden pipes were unclipped before unbolting the inlet manifold. Once the inlet manifold was free from the cylinder head, this was then moved out of the way to expose the rocker cover. All of the bolts were removed, followed by the removal of the rocker cover - revealing the camshafts and the timing belt. (Fig.1)

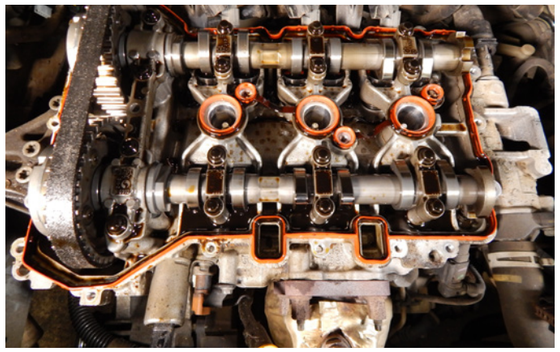


Figure 1

Next, the engine was turned over clockwise at least two times using the crankshaft bolt, until the upper flat surface of the camshafts was inclined by around 30°. This brought the alignment of both the camshafts and the crankshaft ready for the engine locking tools to be installed. (Fig.2)

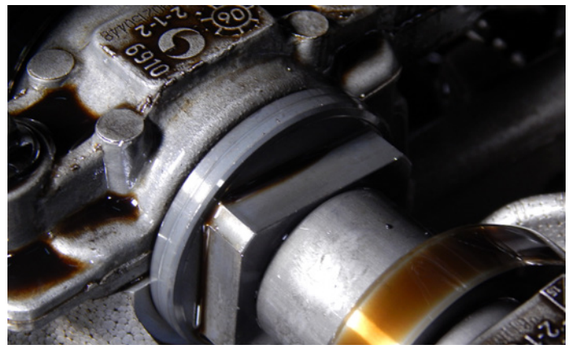


Figure 2

Note: Whilst turning the engine over, the camshaft dephasers should be locked when the pulleys rotate at the same time as the camshaft. The dephasers should remain locked and solid with the camshaft by moving the camshaft gently in both directions. In the event that a dephaser does not lock mechanically, replace the camshaft dephaser.
The engine was slowly turned clockwise by means of the crankshaft pulley bolt and the flywheel-locking tool was inserted. The connector of the injector closest to the camshaft pulley was disconnected and the camshaft-locking tool was installed. These were adjusted to fit the camshafts, fixing them to the cylinder head with the retaining bolts. (Fig.3)

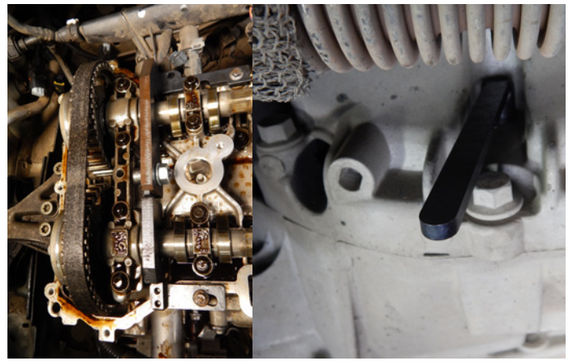


Figure 3

The vehicle was raised and the auxiliary drive belts were removed, along with the three retaining bolts for the crankshaft pulley and the timing belt cover. This revealed the timing belt tensioner and idler. (Fig.4)

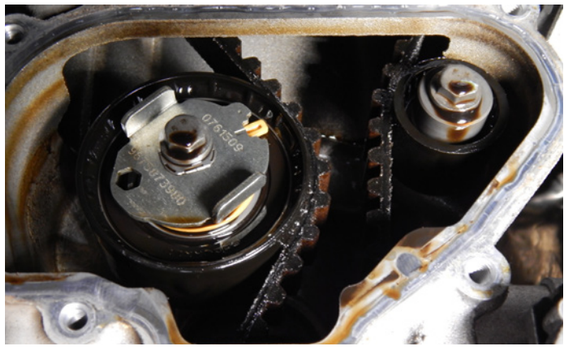


Figure 4

The next task was to remove the crankshaft hub-retaining bolt, followed by the release of the tensioner bolt and removal of the tensioner and idler pulley.

The crankshaft hub and oil seal were removed - revealing the end of the crankshaft and the oil pump sprocket and chain. (Fig.5)

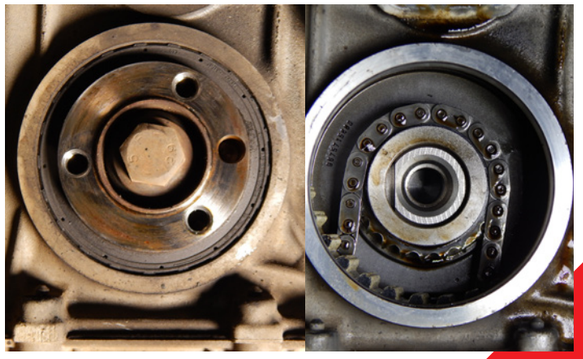


Figure 5

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With all of these parts removed, it was possible to remove the timing belt without removing the camshaft dephaser pulleys. However, if the camshaft dephaser pulleys are to be removed, it is vital that they are refitted to the same camshaft; they are marked ‘’IN’’ for inlet and ‘’EX’’ for exhaust.

With the timing belt removed, it was thoroughly inspected for any wear and deterioration of material.

On inspection, there was no sign of thinning of the belt material. However, it was evident that the contact area with the drive pulleys had started to deteriorate, proving that this belt required replacement. (Fig.6)

Figure 6

With all the components removed, the engine could be reassembled using any new parts that were required. Firstly, the new timing belt was fitted from the top of the engine and attached to the camshaft pulleys. Then, with the vehicle raised, the camshaft hub was aligned with the crankshaft and installed with a new bolt - but not tightened. Next to be installed was the new timing belt tensioner and idler. With the belt carefully fitted to and around all the pulleys, the timing belt was tensioned by rotating the eccentric roller tensioner using a 15mm six-sided socket, until the marks aligned. Then, the tensioner and crankshaft bolts were tightened. (Fig.7)

When completely satisfied that the timing belt was installed and tensioned correctly, the locking tools were removed. The engine was rotated at least two times, using the crankshaft bolt, and the engine timing points were realigned. The locking tools were installed to check that the engine timing was set correctly and the timing belt tensioner was checked as well. The locking tools were removed and the new crankshaft oil seal was fitted.

Figure 7

The engine timing belt cover was refitted using a new seal and the four fixing bolts were tightened. The crankshaft pulley was reinstalled and new auxiliary drive belts fitted.

The vehicle was lowered and the rocker cover refitted using a new gasket - after checking that all the metal dowels were present in the cam cover (they are prone to falling out).

Using new seals, the inlet manifold was installed. Then, all pipes and wiring connectors - including the ignition coils - were fitted.

The air cleaner assembly was refitted, the engine was filled with fresh engine oil and was then started and checked for any oil leaks. The wheel arch liner and wheel was refitted, and then a road test was carried out.

It is important that the vehicle manufacturer’s recommended service replacement intervals are regularly checked and adhered to for each model fitted with this engine. These essential checks are important, as changes have been made to the recommended replacement of the original timing belt during the production period of this engine - subject to make, model and assembly date range. In addition, the timing belt should be visually checked at each service, along with the use of the recommended engine oil.

The replacement febi timing belt, 47947, adheres to all of the latest specifications from the engine manufacturer and is produced from the same high-quality materials to assure an optimum repair solution.

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