

# Timing chain wear and the impact it has on engine performance



Fast running engines which are fitted to passenger cars and light commercial vehicles commonly use a metal timing chain, which is located within the engine and lubricated by the engine oil, connecting the crankshaft to the camshaft, this in turn controls the opening and closing of the intake and exhaust valves. Over extended periods of continuous use the chain drive gradually elongates. This can eventually lead to camshaft and crankshaft synchronisation issues, disrupting the accurate control of the intake and exhaust valve timing, leading to engine inefficiency and increased emission levels leading to eventual failure.

Elongation of the chain drive can occur in many parts of the system.

Chain - wear occurs mainly on the pins and in the bushes.

Sprockets - contact area with the chain, wear on the sprocket teeth.

Tensioner – becomes weakened in time, incorrect tension control.

Tensioner and guide rails – becomes worn as other components wear, cutting grooves into the guiding surface.

As a timing chain wears and slack develops between surfaces that are in immediate contact, the slack causes the chain to elongate and changes its pitch through the relative displacement of the links. This is detected in the rollers and supports on a roller chain and in the pivot pins and links, which can eventually cause the system to weaken leading to chain drive failure.

febi timing chain kits correspond to the latest technical developments, upgraded components are used, these include strengthened chain guides with optimised surface structure and superior quality chains treated with a TRITAN® coating. This coating improves friction properties to reduce wear and optimises engine fuel consumption. The sprockets in the kit are designed to reduce chain load and tensioners with improved damping characteristics. A complete febi chain repair kit has significant friction improving properties and strength for a confident replacement with improved noise, vibration and harshness qualities and efficiency features.



As vehicle engines develop with a reduction in weight and capacity and an increase in power output. Increased stresses are put on these linking components, particularly in high powered, fuel efficient diesel and direct injection petrol engines. Coupled with other emission reducing technologies, such as stop-start and hybrid vehicles there is a need to minimise timing chain wear as vehicle emission legislation continues to tighten.

The constant rotational stress on the chain and sprockets coupled with the dynamic forces within the internal combustion engine contribute to wear, also the degradation of the oil plays a significant factor. Chain drive wear can be accelerated by various factors, including the repeated pivoting motion of the driven links or bushes against stationary connector pins, along with the presence of excessive amounts of soot and acid in the oil and the relationship with other timing components.

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