

With Tritan against wear

The ever-increasing demands on diesel and petrol engines require resilient components with high wear resistance. A core component is the timing chain.

Task and structure of the timing chain

The control chain has the task of connecting and synchronizing the crankshaft with the camshaft.

Key components of the timing chain drive are: gear wheels, tension and slide rails as well as chain tensioners.

Basically, one differentiates between three types of timing chains:

The type of chain used in the engine is mainly determined by the engine's design.

The timing chain is subject to considerable dynamic stress during engine operation, which is due to the strong vibrations in the chain drive. The vibrations are caused by the uneven running behaviour of the crankshaft and the camshaft. A further cause may be the fluctuating power requirement of the driven secondary components. In some cases, for example, the injection pump may be part of those.

Chain elongation as a sign of wear

As a result of the above-mentioned loads, wear elongation occurs over time, which leads to a shift in the control times.

This affects the exhaust and engine running characteristics. If the control times shift more intensively, there is a risk of engine failure.

The chain elongation occurs in the chain joints and determines the service life of the installed control chain.

TRITAN®

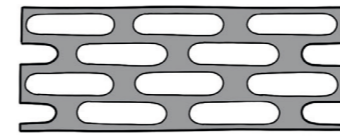


The chain joint connects the inner and outer link, which in the case of the bush chain is composed, for example, of the bushing and the pin. Wear is a result of the mechanical load of the two components against each other.

In studies, a typical elongation of 0.5% was measured after an operational performance of 250,000 km. If the wear elongation is 1% and above, the perfect functioning is not ensured any longer and the timing chain must be renewed.

To prevent premature wear and tear of the timing chain, the OE supplier IWIS has developed the Tritan technology for chain pins. This ensures the freedom of maintenance of the timing chain even with increasing requirements.

PLATES



Steel belt

Normal stamping
Recutting
Fine stamping

Refine
Barrel finishing

Inner plate

BUSHINGS / ROLLS



Steel belt

Winding
Calibrating

Barrel finishing
Case hardening
Shot blasting

Roles
assemble

Bushings
to press in

PINS

Steel wire

Cut to length
Forms
Grinding

Heat treatment
Chromating or gas nitriding
Barrel finishing

Press the pin

Mounting · Riveting · Oiling · Checking

Production sequence of a timing chain

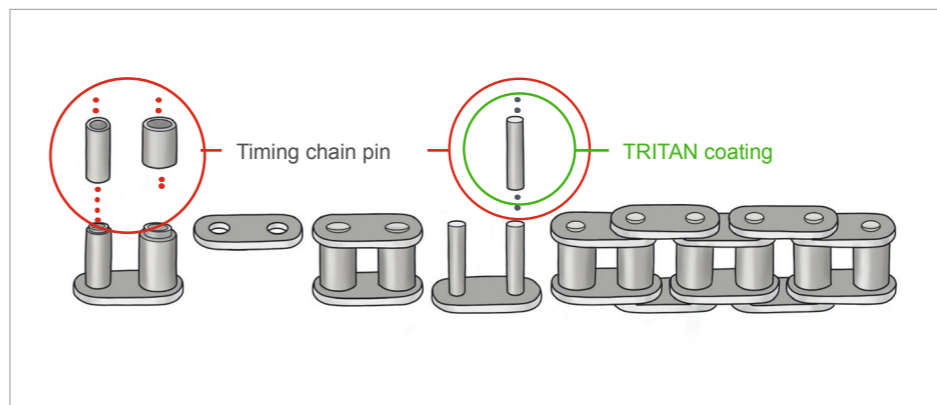


The coating is carried out according to the "Physical Vapor Deposition" principle (PVD). With that, the pin is bombarded with ions under a high vacuum to remove material. The desired chromium nitride layer at the pin material is formed by a reaction gas.

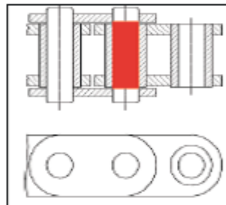
This particular process provides improved resistance to aggressive oil-carbon-fuel mixtures. This results in a wear improvement of at least 50% compared to other coating methods. In addition, friction has been reduced by 20%, which contributes to a reduction in CO₂ emissions.

The data on wear improvement and friction reduction have been demonstrated on special test stands by IWIS.

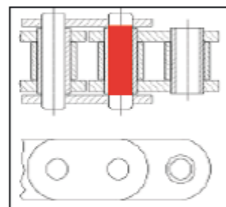
In addition, you can rely on spare parts in tested OE matching quality from febi bilstein. You can find the entire passenger car range at: partsfinder.bilsteingroup.com



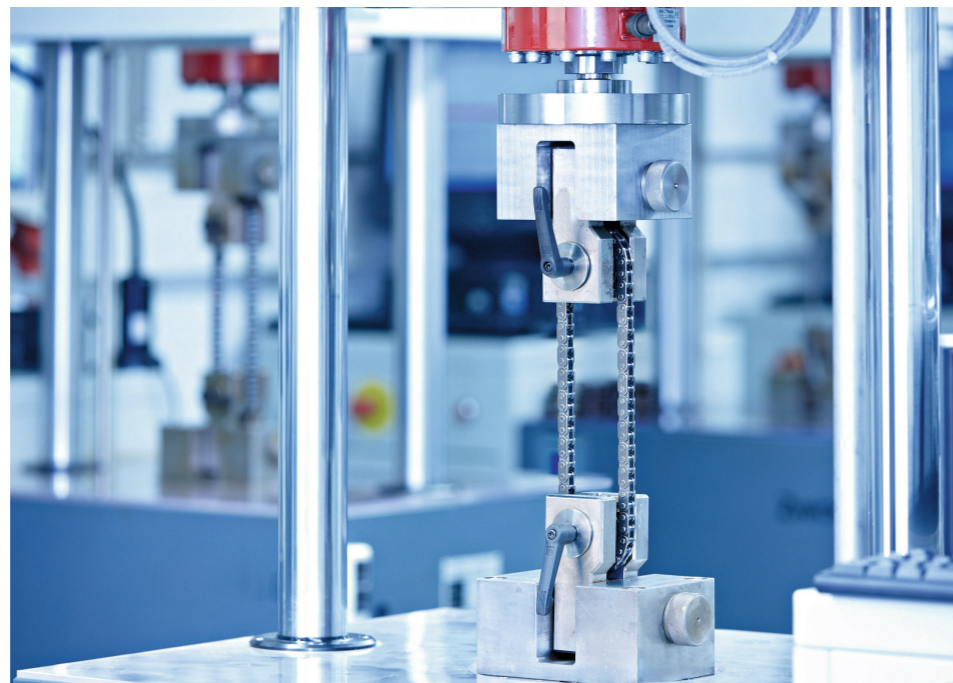
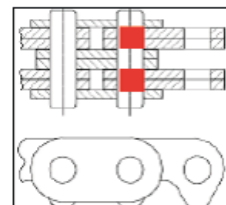
Bush chain



Roller chain



Toothed chain



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