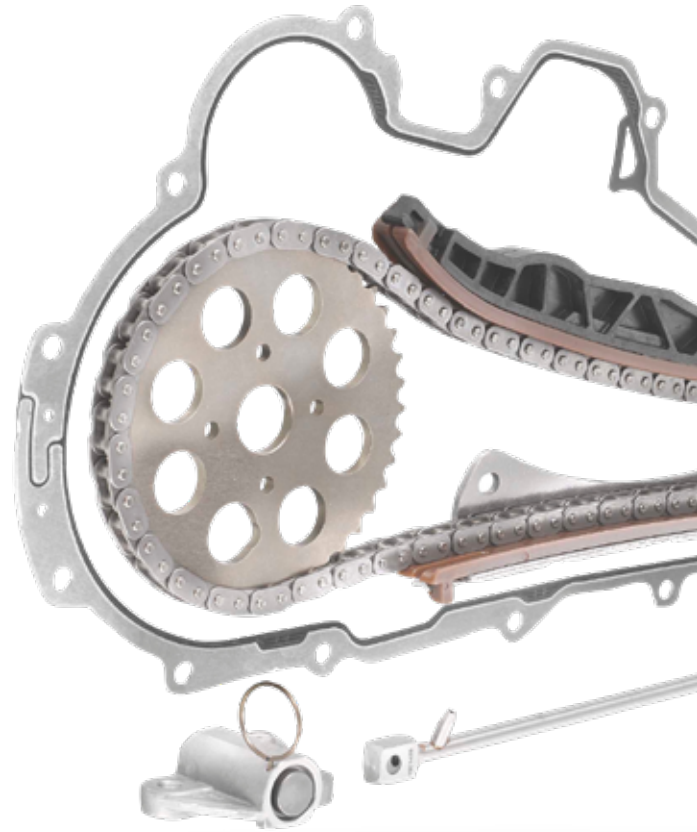


Engine timing: Role and definition

The engine's timing system keeps the camshafts in sync with the crankshaft. The former controls the motion of the valves relative to the pistons. Whether it uses a chain or a belt, the timing system also drives the injection pump and water pump in some cases. The critical role the timing system carries out demands precision and quality products are used, to help eliminate the risk of engine failure. The timing system is the most essential part of the engine and ensures the transmission of power to the drive wheels.



Market: Timing chains are back, stronger than ever

Now back in use again in many of today's vehicles, the timing chain had been largely abandoned in the 1990's, as the vehicle manufacturers started to favour the timing belt, which was lighter, quieter, less expensive to maintain and more fuel efficient. Recently, however, the timing chain has regained its popularity and is no longer used only in heavy-duty engines.

Automotive manufacturers and drivers appreciate its many advantages:

- Its long service life and its durability
- Its compatibility with new hybrid engines
- Its lighter and quieter new design

The SNR timing chain kit range comprises of:

- A **range of 100 part numbers** that cover the needs of the market.
- The expertise and know-how of an **original equipment and aftermarket manufacturer**: NTN is a worldwide market leader in original equipment hydraulic tensioners.
- An **extensive product range** comprising of specific kits (oil pump drive kit, upper or lower timing chain kits) and complete kits including all chain drive power transmission components (timing chain kits, oil pump chain drive kit, hardware, seals, and gaskets).
- **Coverage** of most vehicle models using a timing chain **in Europe today**
- A **range of services** that ensure lasting, reliable maintenance and repair work. More than 120 part numbers have been developed together with CLAS to offer a new range of tools, tested and approved under the SNR brand.

The SNR timing chain kits include:

Chain

Its job is to synchronise the camshaft, the injection pump, and the crankshaft. Located in the engine block, it is lubricated by the engine oil, which keeps it operating smoothly. It is the main component of the timing chain system; there are different technologies, such as block type or split-link chains, for example. The type of chain is selected according to the vehicle application, horsepower, and type of engine. It is important to follow the manufacturer's recommendations regarding choice and maintenance of the chain to ensure the optimum performance and maximum service life of the engine.



Hydraulic tensioners

NTN tensioners use a hydraulic system comprising of several components: springs, cylinders, push rod and seal inside a metallic body. They contain oil that can withstand extreme temperature variations. One of the main sources of wear to the tensioner body is the elongation and stretching of the chain.



Sprockets and VVT*

There are key components over which the timing chain runs. These are toothed wheels whose tooth design and orientation are precisely machined for perfect synchronisation with the chain. The material these parts are made from can differ according to the technical requirements of the chain system.

Variable valve timing (VVT) sprockets make it possible to optimise air intake and exhaust in the engine to enhance the vehicles performance.



Slider shoes or guide/tensioner rail

Parts primarily made of glass fibre reinforced polyamide but can also be made of biomaterials (plastic, metal or aluminium). The slider shoes are designed to guide and/or tension the chain. Quality parts are essential for reducing vibrations and noise while maintaining proper chain tension.



* Continuously variable engine timing

Technical tips to extend service life

Unlike timing belts, timing chains do not have any periodic replacement interval specified by the manufacturer. Nevertheless, it is essential to maintain them properly!

The components of a timing chain system are subject to high loads and tensions. Over time, this can lead to deterioration and wear. Because they are lubricated by the engine oil, they require regular inspection.

To guarantee engine and timing chain kit performance, NTN lists the signs of any possible problems :



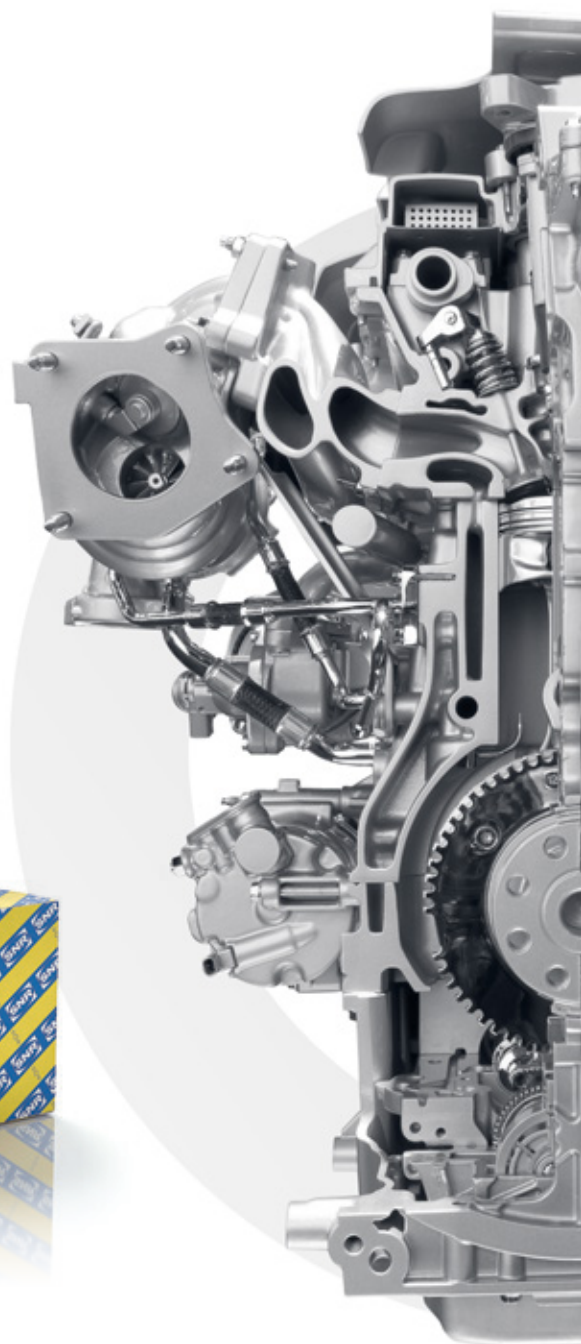
- Particulate contamination in the oil, can be a major cause of timing chain issues
- Unusual noises
- Degradation of performance, stalling or stuttering
- Difficulty starting
- "Check engine" light illuminated on the instrument panel

How to take care of a timing chain?



- Follow the engine oil change intervals to guarantee correct lubrication of the chain.
- Use high-quality oil specified for the vehicle.

To ensure that the timing chain kit is replaced with one of OE quality, use a complete kit from SNR!

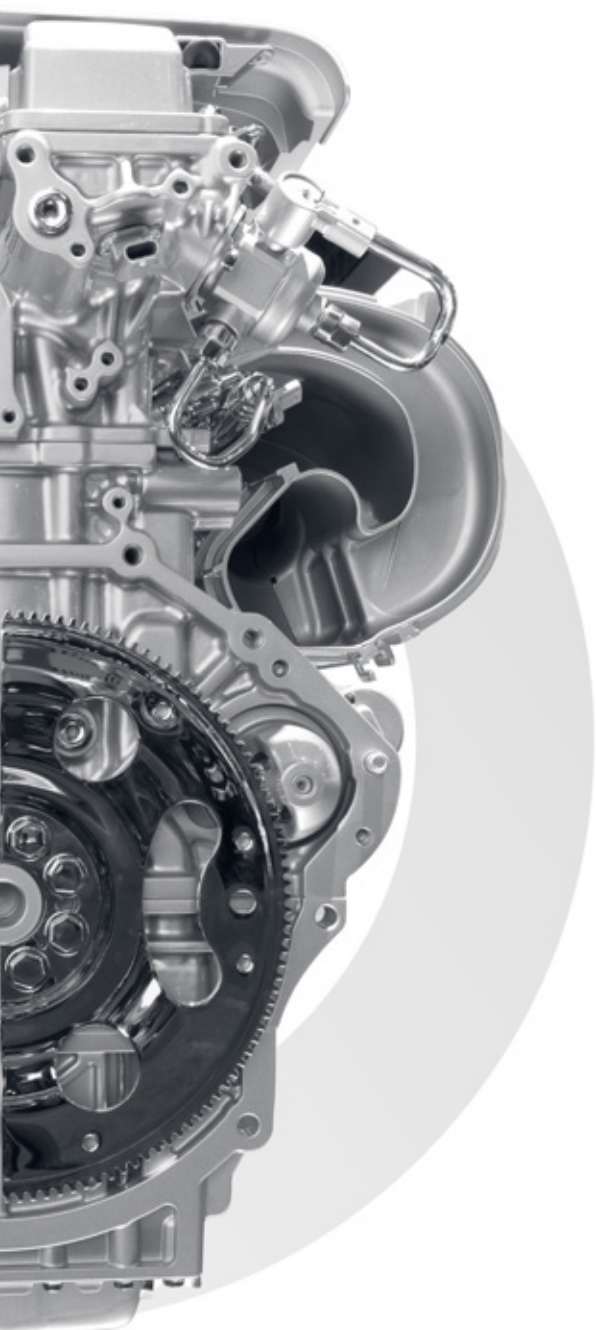


NTN, world leader in hydraulic rollers

NTN is the leading supplier of original equipment hydraulic tensioners used in both timing belt and timing chain applications. This type of tensioner uses a hydraulic cylinder system comprising several components, including a spring and a metallic sheath. The oil can withstand extreme temperature variations. This complex part requires a mastery of manufacturing processes that only an engine specialist can guarantee.

Advantages of an NTN hydraulic tensioner:

- Perfect adjustment of chain or belt tension
- Optimal absorption of tension variations
- Resistance to temperature variations
- Extended service life
- Quieter operation makes driving more comfortable



NTN, an original equipment manufacturer, supplies all major automotive manufacturers the world over.

NTN manufactures its timing system rollers and tensioners at its factories in Mettmann, Germany, and in Nagano and Iwata, Japan. The latter site is also where the R&D centre is located.

In continuous pursuit of innovation and the further development of its POWERTRAIN product range, NTN unveiled a new type of compact chain tensioner at the 2019 at the Tokyo Motor Show. This new product has made a considerable contribution to engine downsizing and made it possible to reduce oil consumption by 10 %. Since 2006, NTN has been producing an average of 12 million tensioners and 40 million bearings for rollers per year.

*Engine size reduction



Services

To satisfy your needs, NTN supports you with:

- Technical experts to assist you with your everyday issues
- On-site training courses and e-learning modules
- Tech Infos: data sheets and removal/installation tips
- Technical tutorials on our SNR Automotive Aftermarket YouTube channel exclusively dedicated to repair technicians
- TechScan'R: an app dedicated to garages looking for just the right part along with the associated best practices for installation.





NTN

Make the world **NAMERAKA**



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