

INA System solutions for the valve train

High technology and a top level of precision



The content of this brochure shall not be legally binding and is for information purposes only. To the extent legally permissible, Schaeffler Automotive Aftermarket GmbH & Co. KG assumes no liability out of or in connection with this brochure.

All rights reserved. Any copying, distribution, reproduction, making publicly available or other publication of this brochure in whole or in extracts without the prior written consent of Schaeffler Automotive Aftermarket GmbH & Co. KG is prohibited.

Copyright ©
Schaeffler Automotive Aftermarket GmbH & Co. KG
May 2017

Schaeffler in the Automotive Aftermarket – more innovation, more quality and more service.



Schaeffler REPERT – the service brand for garage professionals.

With REPERT, we offer a comprehensive service package for our products and repair solutions. Looking for specific information about damage diagnosis? Are you in need of particular tools to help make your every-day garage routine easier? Whether online portal, service hotline, installation instructions and videos, training seminars, or events – you get all technical services from a single source.

Register now for free, in just a few clicks, at:
www.repxpert.com.

Schaeffler in the Automotive Aftermarket – always the first choice for vehicle repair.

Whenever a vehicle needs to go to the garage, our products and repair solutions are first choice to fix them. With our system competence in transmission, engine, and chassis, we are a reliable partner around the world. Whether passenger cars, light and heavy commercial vehicles, or tractors – our optimally tuned components allow fast and professional parts replacement.

Our products are based on a comprehensive systems approach. Innovation, technical expertise, and the highest material and manufacturing quality make us not only one of the leading development partners for vehicle manufacturers, but also a pioneering provider of value-retaining spare parts and complete repair solutions for clutches and clutch release systems, engine, and transmission applications, and chassis applications in original-equipment quality – right up to the appropriate special tools.

Know-how of the four key systems of the engine – this is what the brand INA stands for. The product portfolio includes a full range of engine components for the timing drive (for both belt and chain-drive vehicles), for the front end auxiliary drive (FEAD), for the valve train, and the cooling system. The spare part portfolio has both individual products, and solutions that are available in complete KITS and SETs.

SCHAEFFLER
REP>XPERT



The function of the valve train

An internal combustion engine must be cyclically supplied with fresh air, and exhaust gas must be cyclically discharged. The task of the valve train is to open and close the intake and outlet channels to allow this charge change process to be carried out as efficiently as possible. Depending on the engine design, a distinction is made between valve trains according to the number of valves they activate, and the number and location of the camshafts driven by them.

Due to its function, the valve train is exposed to high accelerations and decelerations. In addition, the exhaust valves have to withstand extreme temperatures coming from the hot exhaust gases. To be able to work correctly under these conditions, valve train components should therefore:

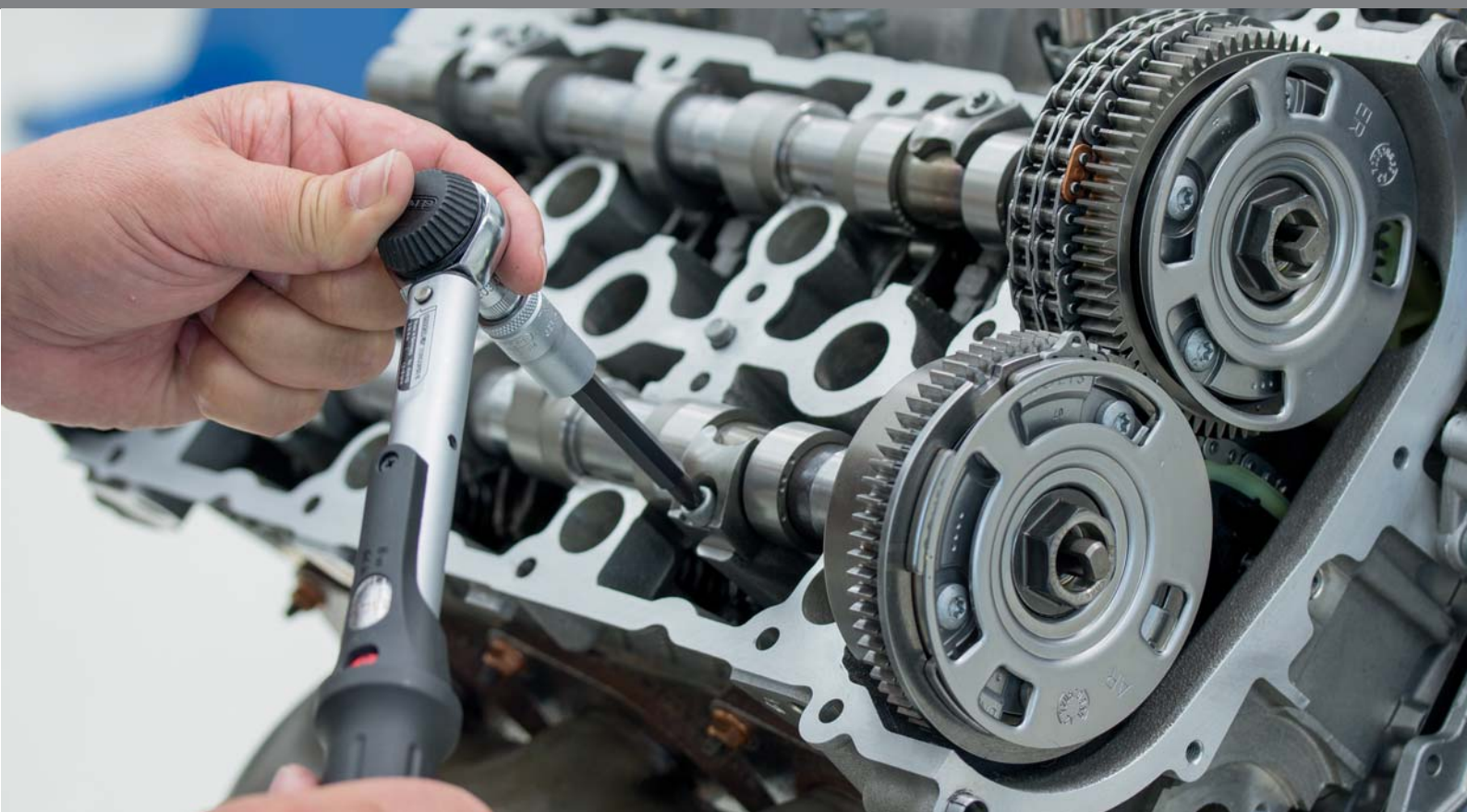
- Exhibit a high level of strength
- Produce low amounts of friction
- Ensure sufficient heat dissipation from the valves

In order to guarantee proper functionality, it is also crucial to exclude valve lash and keep the performance characteristics of the engine stable throughout its service life.

What can you expect from INA?

INA is the leading producer of all types of valve train components. As a technology leader, our focus is on the highest precision in production and assembly throughout our range, which also includes switchable products, for example. Our first-class components in the valve train withstand rising temperatures and high pressures on ever smaller engines. With a wide range of repair solutions, INA is also ideally positioned in the aftermarket, allowing valve trains to be repaired professionally and efficiently.





INA as a technology leader – a success story

The reliable product quality of the Schaeffler brand INA is extremely well accepted, both in Europe and the rest of the world – a result that we are proud of, and see as an incentive and a commitment for the future.

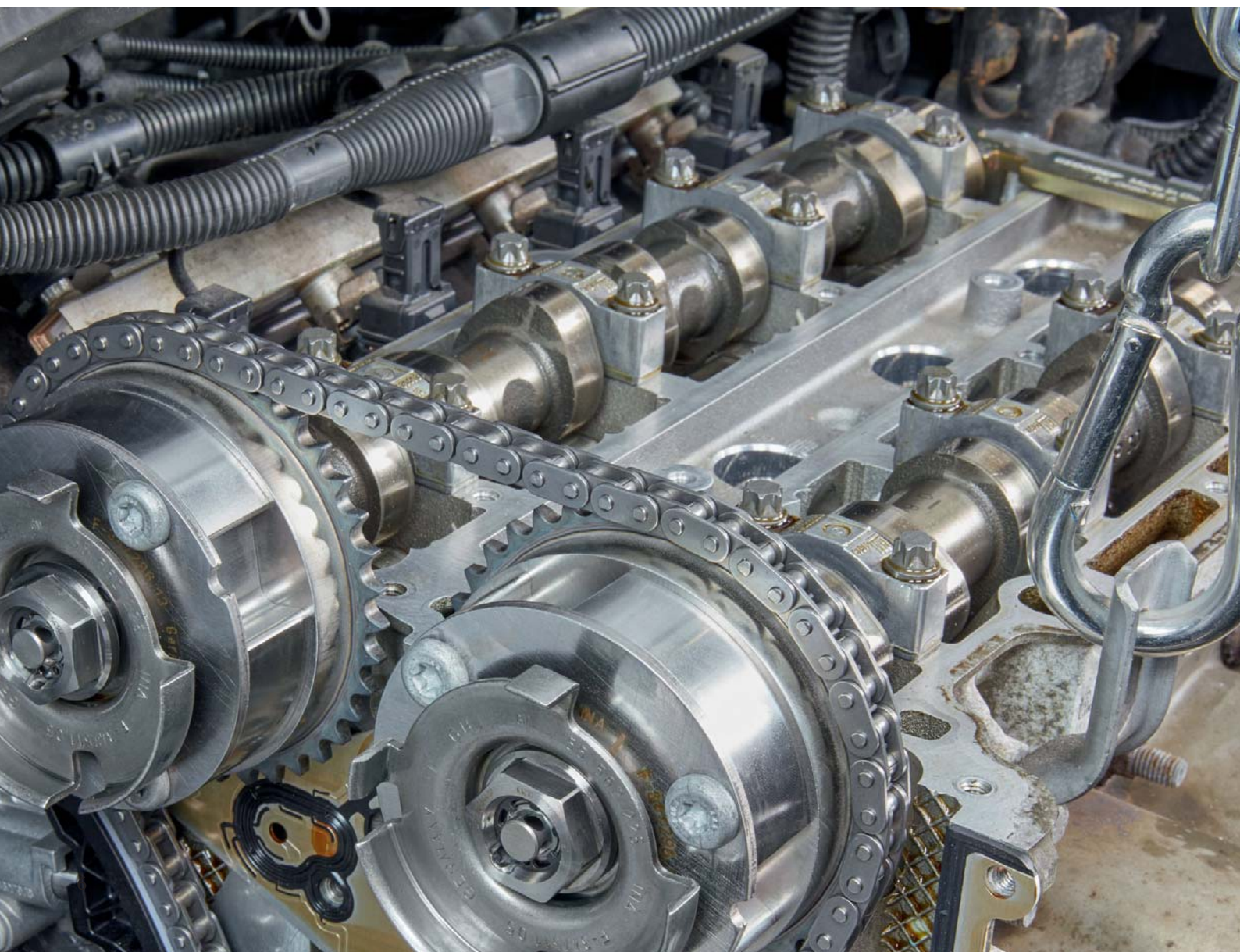


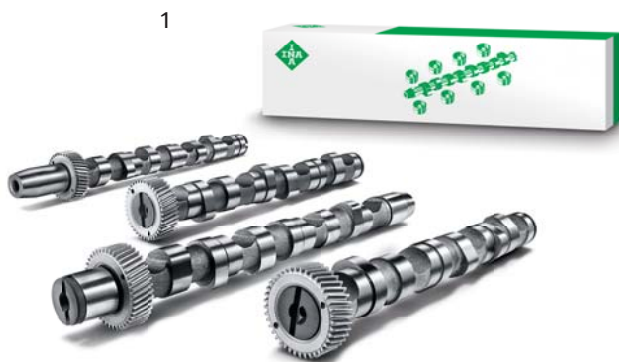
Our range is the market leader when it comes to valve trains

As the leading provider in the field of valve trains, INA offers a range that leaves nothing to be desired. But diversity is only one aspect of the intelligent repair solutions from INA. Our valve train components are equipped with all the necessary accessories for ensuring efficient and sustainable installation and are also perfectly compatible with one another.

The INA range includes both hydraulic and electric variable camshaft timers and valves. With the help of these products, control times can be adjusted variably, which in turn increases the efficiency. Bucket tappets, finger followers and swing arms are also included in the range, as well as rocker arms and rocker arm bridges. Other innovations from INA include INA camshaft KITS, as well as camshaft KITS with variable camshaft timers.

At www.repxpert.com INA also offers you a comprehensive range of services, more detailed product information, and concrete work aids, such as training sessions.





The INA valve train range:

1. Camshafts and camshaft KITS
2. Variable camshaft timer for chain drives (hydraulic & electric)
3. Variable camshaft timer for belt drives
4. Central valve
5. Control valve
6. Roller-type finger follower
7. Tilt/swing arm
8. Hydraulic pivot element
9. Bucket tappet



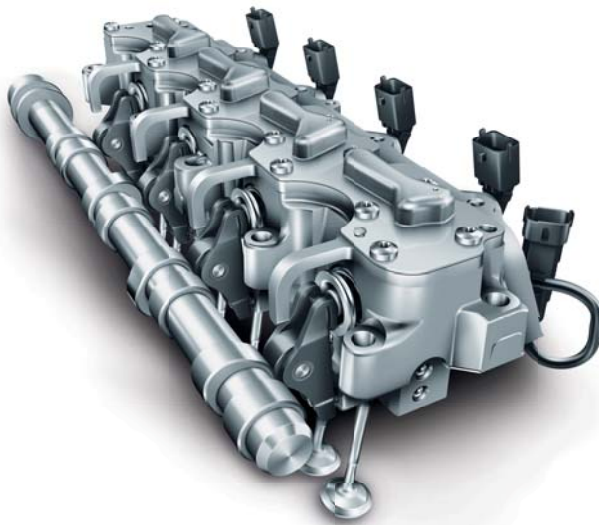
Our focus during development

INA is leading the way when it comes to technical developments, and will also influence and shape them significantly in the future.

The current development objectives in the engine sector are the main focus. These include, for example:

- Reducing CO₂ emissions
- Reducing frictional losses
- Increasing efficiency

We give some examples below of the kind of INA valve train systems and products that enable these objectives to be achieved.



UniAir

Using the first electro-hydraulic system worldwide to allow fully variable control of the inlet valves in petrol and diesel engines enables the engine to always operate at optimum efficiency. This causes fuel consumption to be reduced by up to 10 %, performance to be increased by 10 %, and torque in the lower engine speed range to be increased by up to 15 %.



Switchable roller-type finger follower

In conjunction with the hydraulic valve lash compensation elements, this provides a permanent and constant valve lash. Contact with the cam is provided by a roller with rolling bearings. By using cam rollers, the low-wear and maintenance-free roller-type finger follower causes much less friction loss in comparison to bucket tappets.



Electromechanical camshaft phasing unit (ECP)

The ECP developed and produced by Schaeffler enables the camshaft to be adjusted faster and more accurately to the prevailing engine operating conditions. This reduces the fuel consumption and CO₂ emissions, as well as leading to increased driving dynamics, particularly in the lower speed range. Of interest when starting the engine: In contrast to a hydraulic timer, on the ECP it is possible to turn the camshaft while the engine is stopped.



Cross-system repair solutions

INA is the first provider in the aftermarket to offer cross-system repair solutions covering several key engine systems. As the individual subsystems are technically linked to each other, such repair solutions are very useful. After all, integrated maintenance is particularly efficient and ensures the smooth and sustainable functionality of all key systems.

An example of such a repair solution: **The kit for Opel 1.2 L & 1.4 L (A12/A14)**. This solution combines components from both the chain drive and the valve train in a single box:

- Timing chain, tensioner, sprocket wheels, rails
- Variable camshaft timer and valves
- Various seal rings and seals (oil sump, cover for timing drive, water pump, variable camshaft timer)

Notes

[illegible]

Notes

[illegible]

