

Invented for life



Drive technology

For reliable power transmission in the engine:
powerful, resilient and durable



Drive technology

Overview

In daily use, Bosch drive technology delivers high performance – despite high mechanical, chemical, and thermal loads. Timing belts, V-belts, ribbed V-belts, belt tensioners and idler pulleys are designed for this purpose and impress with their high resilience and long service life.

Technology for excellent power transmission

Regular timing belt replacement has become a key element on all maintenance schedules. Efficient power transmission can only be achieved complying with the replacement intervals specified by the vehicle manufacturers. For quick and safe replacement, Bosch also provides complete sets such as timing belt and water pump kits. The range is complemented by additional individual components of the accessory drive.

Fully equipped for regular service

Bosch supplies workshops with anything needed for regular complete servicing and to carry out tasks in an efficient manner:

- broad range of timing belts, V-belts, ribbed V-belts, tensioner and idler pulleys and torsional vibration dampers
- outstanding quality meeting the demanding requirements of vehicle manufacturers in terms of change intervals



Main drive Program



	Timing belts	Timing belt kits	Timing belt kits with water pump	Timing belt kits with switchable water pump
	<p>Synchronized power transmission with low noise and high operational safety throughout the entire service life: Bosch timing belts</p>	<p>Long-term power transmission that is efficient and synchronized: The Bosch timing belt kits are vehicle-specific and contain all components.</p>	<p>Long-term power transmission that is efficient and synchronized: The Bosch timing belt kits with water pump are vehicle-specific and contain all components, including the coolant pump driven by the timing belt.</p>	<p>Timing belt kits with switchable water pump – the warm-up phase of the engine is shortened, the passenger compartment warms up more quickly. Depending on the engine-relevant operating conditions, fuel consumption can be reduced by reaching the operating temperature more quickly.</p>

Scope of application				
<p>Advantages at a glance</p>	<ul style="list-style-type: none"> ■ High functional reliability ■ High comfort ■ Outstanding power transmission ■ Cords with high longitudinal stability 	<ul style="list-style-type: none"> ■ Quick and professional replacement ■ Easy and time-saving installation ■ High reliability 	<ul style="list-style-type: none"> ■ Quick and professional replacement ■ Easy and time-saving installation ■ High reliability 	<ul style="list-style-type: none"> ■ More comfort ■ Complete kit for easy installation ■ Fail-safe function thanks to integrated spiral compression spring: engine cooling is ensured even if the control system fails – and overheating is prevented

Workshop tip

Tie bolts used once must be replaced every time.

If required, such fastening parts are included in the Bosch timing belt kits.

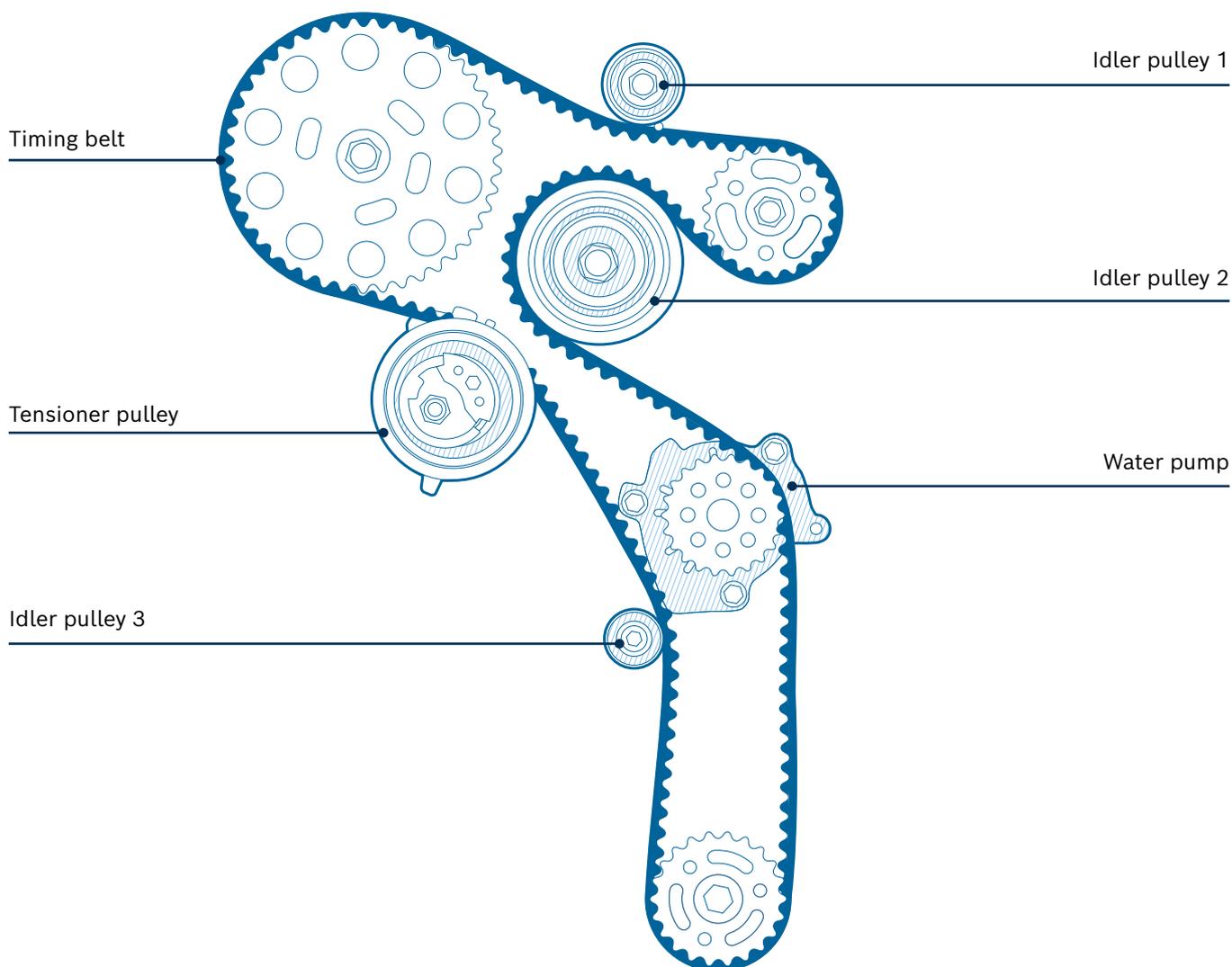


ESI[tronic] Software



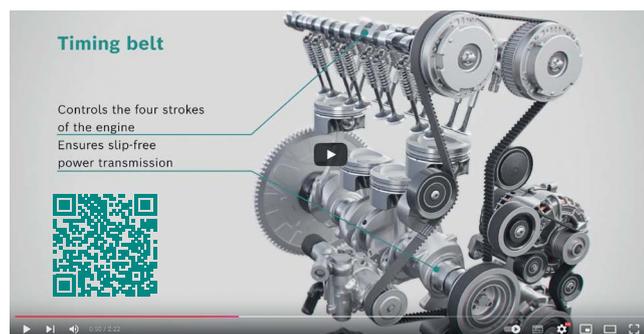
ESI[tronic] diagnostic software supports during the replacement of timing belt and water pump kits. Vehicle-specific advices save valuable time to the workshop and prevents assembly errors.

Main drive Technology



Heroes under the hood

Timing belts operate under extreme tough conditions and at the same time work highly precise. The video shows how the timing belt works in the system.



Watch the video: Scan the QR code!



3 questions to workshop customers

- Is the mileage higher than 60,000 km?
- Do you intend to keep the vehicle for more than 6 months?
- Do you drive more than 2,000 km a year?

Workshop tip: An engine failure due to of a defective timing belt will certainly cause very high costs. Replacing timing belts, tensioner pulleys and water pumps as a preventive measure can save a lot of money in the end.

Timing belts

Product details

Synchronised power transmission with low noise and high functional safety throughout the entire service life: Bosch timing belts.



Advantages at a glance

- **High functional safety** due to engine-specific rubber compound and belt design
- **High comfort** thanks to quiet running
- **Reliably synchronous power transmission** due to engine-specific tooth profile
- **Tensile cords with high longitudinal stability** due to usage of fiberglass
- **Protection of the teeth** due to for example Teflon or Xylan and a high quality cover fabric of the belt backside



Belts in oil

Compared to dry running timing belt, oil-bath-driven timing belts feature significantly reduced friction losses. This results in reduced fuel consumption. Additional advantages compared to the dry running timing belt:

- increased engine performance
- reduced pollutant emissions
- smooth engine operation
- reduced noise level

Timing belt kits

Product details

Vehicle-specific kits – complete, including all required components – ensure powerful and synchronized long-term power transmission.



Advantages at a glance

- **Quick and professional replacement** thanks to precisely matched components in excellent quality
- **Easy and time-saving installation** thanks to vehicle-specific installation instructions in ESI[tronic]
- **Particularly high reliability** due to comprehensive functional and endurance tests

Workshop tip

Timing belt kits pay off for the workshop:

- Workshops save time with every order and benefit from more storage space – with only one order number for all parts.
- All relevant components in one operation – fewer workshop visits and an all-round service increase customer satisfaction in the long term.
- By replacing all wearing parts belonging to the system, the risk of consequential damage and thus customer complaints is reduced.

Timing belt kits with water pump

Product details

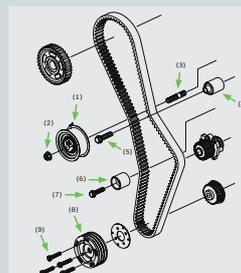
Water pump kits coming with all required components – including the timing belt driven water pump – ensure powerful and synchronous long-term power transmission.



Advantages at a glance

- **Quick and professional replacement** thanks to precisely matched components in excellent quality
- **Easy and time-saving installation** thanks to vehicle-specific installation instructions in ESI[tronic]
- **Particularly high reliability** due to comprehensive functional and endurance tests

ESI[tronic]



To support repairs and maintenance in workshops, the workshop software ESI[tronic] offers a whole range of clear and easy-to-understand technical information.

Timing belt kits with switchable water pump

Product details

The switchable water pump included in the kit shortens the warm-up phase of the engine. The passenger cell is heated up more quickly. Depending on the engine-relevant operating conditions, fuel consumption can be reduced by reaching the operating temperature more quickly.

Pre-assembled
switching unit



Advantages at a glance

- **Faster engine warm-up** and more comfort thanks to the electro-hydraulic controllable switching unit
- **Complete kit for easy installation** thanks to the solenoid valve supplied in the switching unit
- **Safety through fail-safe function:** even if the control system fails, motor cooling is ensured and overheating is prevented



How the pump works



During the warm-up phase of the engine, the supply of coolant is interrupted using the cover panel on the impeller. From an engine temperature of 60°C, the impeller is released and the coolant is fully pumped.

Watch the video: Scan the QR code!

Water pumps

Service and repair tips

Water pump leaks, shows signs of calcium or rust



Cause

Water with a high mineral content is added to the system, over a period of time

Effect

- Formation of deposits
- Restrictions to the flow of the coolant
- Damage of the seal of the pump

Recommendation

- Clean the cooling system before replacing a new water pump
- Check system pressure, use correct coolant mixture
- Use distilled water only

Water pump leaks after topping up with coolant



Cause

- The ceramic seal is damaged by adding cold coolant to a hot system
- Engine runs with insufficient volume of coolant in the system

Effect

Sudden change in temperature can cause the ceramic seal to crack

Recommendation

- Always allow the engine and cooling system to cool before adding fresh or cold coolant
- Never start the engine without coolant

Water pump leaks shortly after installation



Cause

Usage of excess sealant during the water pump installation

Effect

- Contamination of the ceramic seal ring
- Premature failure

Recommendation

Usage of the correct amount of sealant when installing

Water pump doesn't turn freely



Cause

- Excessive drive belt tension
- Overload/failure due to vibration or imbalance

Effect

Broken bearing

Recommendation

- Ensure correct belt tension
- Check condition and ensure correct alignment of all elements: pulleys, idler, belt, and others

Accessory drive Program



V-belts	Ribbed V-belts
<p>Open-flanked and toothed Bosch V-belts have been developed for universal application in compact drive designs.</p>	<p>Single and double ribbed Bosch V-belts are used in vehicles equipped with a vast array of options as standard.</p>

Scope of application		
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<p>Advantages at a glance</p> <ul style="list-style-type: none"> ■ Reliability and a long service life ■ Oil- and heat-resistance ■ Ideal for drives with multiple grooves 	<ul style="list-style-type: none"> ■ High functional reliability and performance ■ Perfect fit for every application ■ Outstanding power transmission
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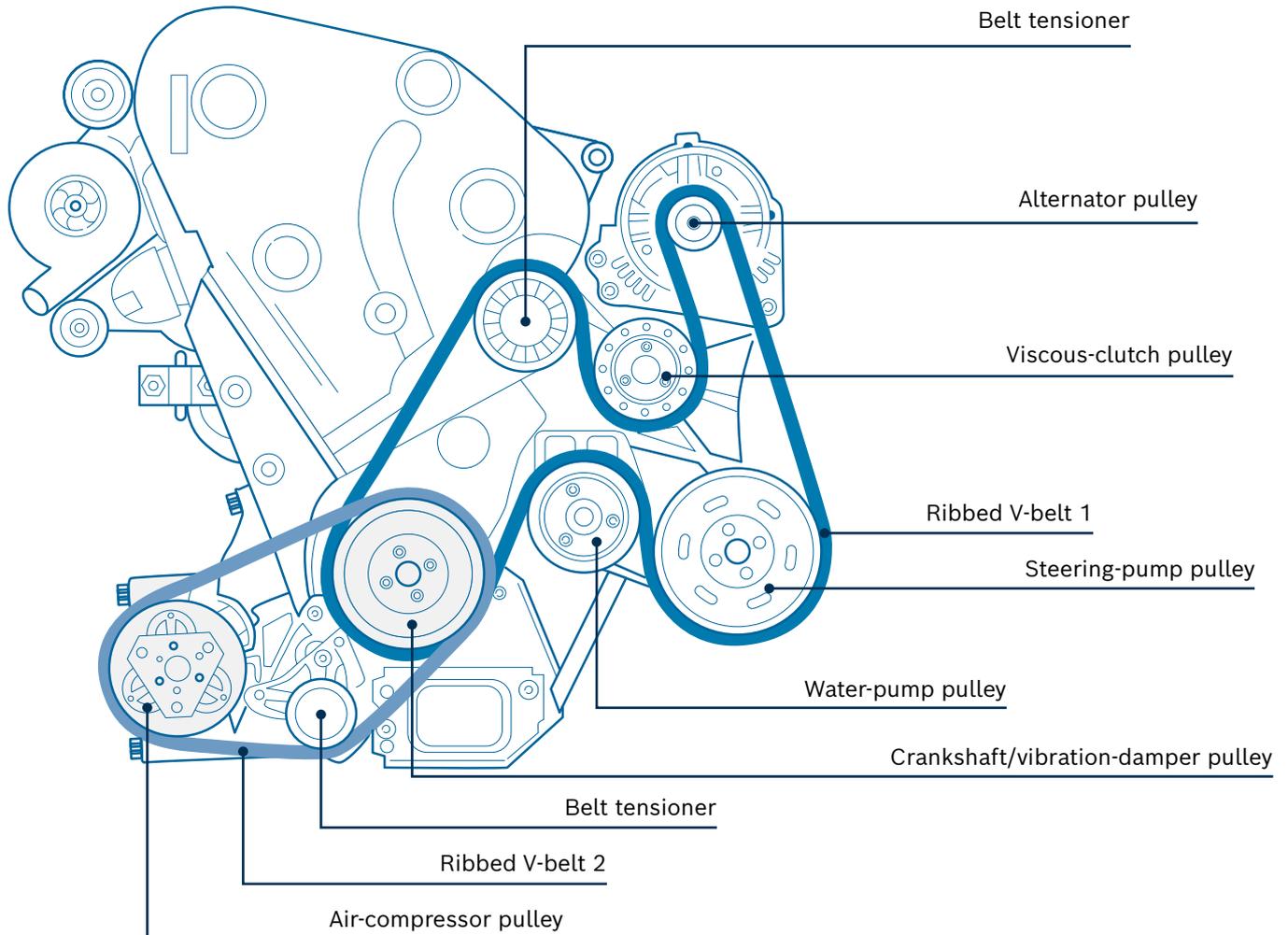


Belt tensioners and idler pulleys	Torsional vibration dampers	Ribbed V-belt kits
<p>Belt tensioners work dynamically adjusting the belt tension particularly well to the respective operating condition and in line with the engine load. Idler pulleys guide the belt thus absorbing part of the load placed on the drive system.</p>	<p>Bosch torsional vibration dampers eliminate any vibrations thanks to their integrated rubber track thus protecting the belt and all of the units.</p>	<p>The vehicle-specific ribbed V-belt kits – complete with all necessary components – ensure efficient power transmission in modern accessory drives with their numerous units.</p>

Scope of application			
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<p>Advantages at a glance</p> <ul style="list-style-type: none"> ■ Reduced noise ■ High mileage ■ Long durability and service life 	<ul style="list-style-type: none"> ■ Increased driving comfort ■ Increased service life of the belt and other components of the belt drive ■ Vehicle-specific designs 	<ul style="list-style-type: none"> ■ Fast and professional change ■ Easy and time-saving installation ■ High reliability
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Accessory drive Technology



Over the last decades, the accessory drives of modern engines have become ever more sophisticated. The requirements placed on the individual accessory-drive components nowadays have become extremely high. Bosch high-performance components thus work highly accurate and reliable.

Bosch accessory drive:

- V-belts
- ribbed V-belts
- belt tensioners and idler pulleys
- torsional vibration dampers

V-belts

Product details

Open-flanked and toothed Bosch V-belts have been developed for universal application in compact drive designs.



Advantages at a glance

- **Reliability and a long service life** thanks to high-quality materials
- **Oil- and heat-resistance** due to fiber-reinforced rubber compound
- **Ideal for drives with multiple grooves** due to precision-manufactured V-belts

When changing belts observe!

- Cool down engine to ambient temperature
- Replace **all** components of a belt drive system
- Avoid misalignment, axial offset and skewed positions and observe specified tightening torque
- Belt pulleys, rollers and tensioning devices are to be protected against operating fluids such as oil, brake fluids, coolants, and fuels.

Ribbed V-belts

Product details

Single and double ribbed Bosch V-belts are used in comprehensively equipped vehicles as standard.



Advantages at a glance

- **High functional safety and performance** – ideal for high belt speeds due to the use of high-quality materials
- **Precise fit for every application** thanks to individually designed material composition and belt properties
- **Outstanding power transmission** due to accurately fitting ribbed profile



Workshop tip



Besides standard belts, Bosch also provides special belts with high performances for modern vehicles. They are used for sophisticated start/stop or hybrid applications, for instance. For particularly resilient tension members, these special belts are often equipped with aramid cords.

Ribbed V-belt kits

Product details

The vehicle-specific ribbed V-belt kits – complete with all the necessary components – ensure efficient power transmission in modern accessory drives with their numerous units.



Advantages at a glance

- **Fast and professional replacement** thanks to precisely coordinated, high-quality components
- **Easy and time-saving installation** thanks to vehicle-specific installation instructions in the ESI[tronic]
- **Particularly high reliability** thanks to extensive functional and endurance tests

Workshop tip

Scan the smart code on the packaging: Find kit-specific technical information under “Downloads” – this saves valuable time and helps avoid assembly errors.

Smart code



Belt tensioners and idler pulleys

Product details

Belt tensioners work dynamically adjusting the belt tension particularly well to the respective operating condition and the engine load. Idler pulleys guide the belt thus absorbing part of the load placed on the drive system.



Advantages at a glance

- **Reduced noise** due to specific damping mechanism
- **High mileage** thanks to precise design for accurate belt alignment and tensioning
- **Long durability and service life** due to effective protection against contamination – compound seal, chrome-silicon torsion spring or protection cap

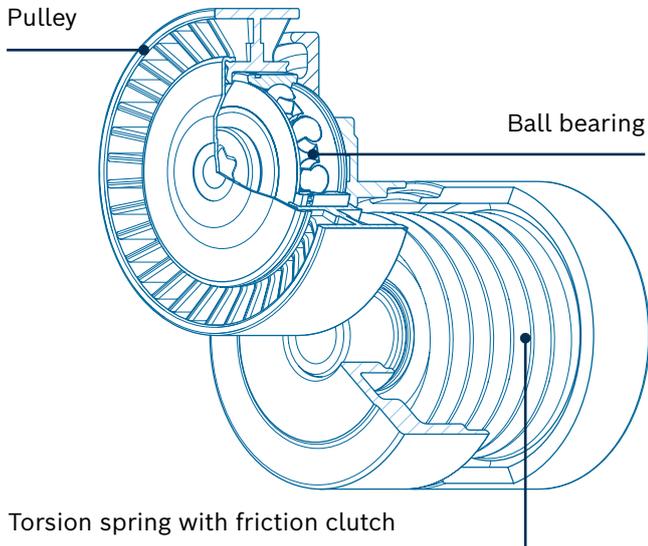
Belt tensioner for hybrid vehicles

Bosch also offers belt tensioners for hybrid applications. These are able to cope with fluctuating torque from gasoline and electric motors and ensure consistent belt tension.



Belt tensioners and idler pulleys

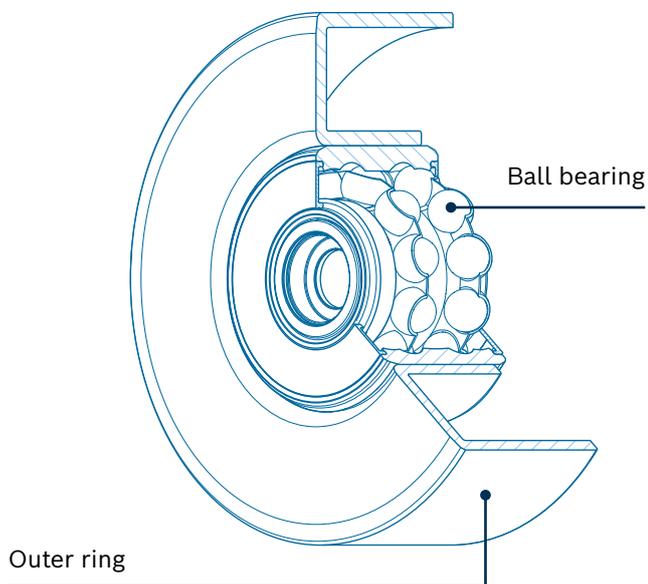
Technology



Belt tensioners neutralize changes in tension within belt drives. This includes short-term changes caused by temperature and load variations as well as long-term changes as a result of wear.

Effective design:

- tensioner pulley with outer ring made of steel or plastic
- single/double-row grooved ball bearings
- torsion spring generating the pretension



Idler pulleys provide precise guidance for the belt – depending on the position of the driven belt pulley. In addition, they increase the wrap-around angle in case higher outputs are to be transmitted.

Effective design:

- single/double-row grooved ball bearings with enlarged grease reservoir
- outer ring made of steel or plastic (polyamide), flat or grooved

Torsional vibration dampers

Product details

Crankshafts cause vibrations and rotational irregularities transmitted to the whole drive system via pulleys and belts – thus straining all units. Bosch torsional vibration dampers eliminate any vibrations thanks to their integrated rubber track thus protecting the belt and all of the units.



Advantages at a glance

- **Increase the driving comfort** due to higher operational smoothness and reduced noise generation
- **Increase the service life of the belt and the other components of the belt drive** preventing vibrations and slip
- **Vehicle specific designs** with single or double elastomer element



Workshop tip

Fluttering ribbed V-belts, uneven tensioners, increased engine noise generation and vibrations indicate a defective damper.

The torsional vibration dampers should be checked at major inspections. Check the crankshaft pulley for tears, detachments, bursts and deformation of the elastomer track. Some belt pulleys feature indicators providing information on the degree of wear.

Torsional vibration dampers

Technology

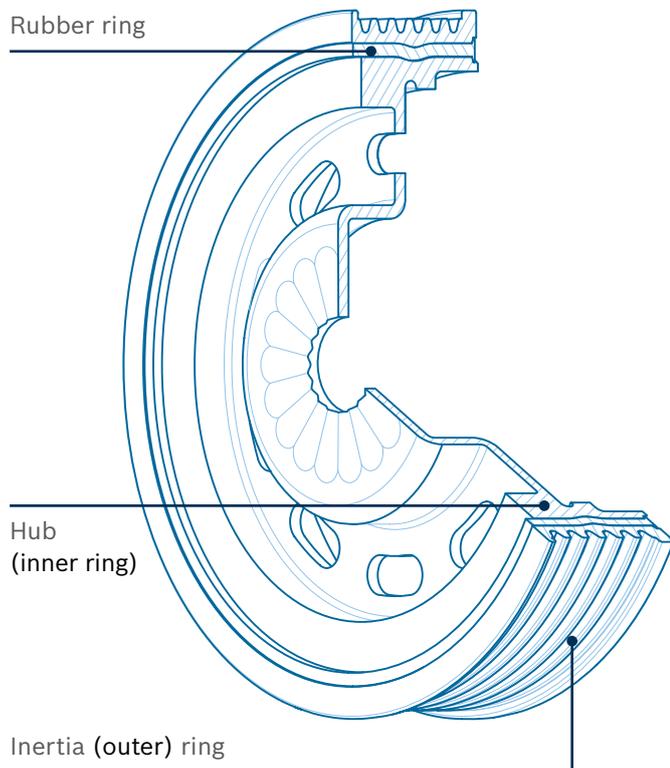


Fig. Torsional vibration dampers – simple version

Torsional vibration dampers absorb the crankshaft vibrations by means of an elastomer element located between their inner and outer rings.

Torsional vibration damper isolators provide additional isolation of the belt drive by means of a second rubber track. Rotational irregularities of the crankshaft are thus not even forwarded to the auxiliary drive. This results in a significant relief for all components of the accessory drive.

Effective design:

- rotating flywheel stabilizing the belt drive
- elastomer element absorbs the torsional vibrations preventing them from being passed on to the outer ring
- dampening of rotational vibrations due to slide bearings



Installation parts

Check if the bolts can be reused!

The ESI[tronic] provides information on which bolts are to be used one time only. For several applications bolts are available at Bosch. The vehicle-specific installation parts can also be purchased at the authorized workshop.

Ribbed V-belts

Service and repair tips

Damage pattern	Cause	Solution	
Uneven rib profile wear 	<ul style="list-style-type: none"> ■ Misalignment or roller bearing damage ■ Severe belt vibration 	<ul style="list-style-type: none"> ■ Replace belt, tensioner and idler, and if necessary, water pump ■ Ensure proper fitting and set correct tension 	↻
Cracking/rupturing of base material 	<ul style="list-style-type: none"> ■ Temperature too high due to insufficient tension or defective bearing ■ Belt worn ■ Foreign particles influence 	<ul style="list-style-type: none"> ■ Ensure proper fitting and set correct tension ■ Replace belt ■ Eliminate foreign particles, check cover and install correctly 	↻
Cracking of belt after short usage 	<ul style="list-style-type: none"> ■ Excessive tension ■ Belt kinked prior to or during fitting ■ Drive components or rollers stiff or blocked 	<ul style="list-style-type: none"> ■ Ensure proper fitting and set correct tension ■ Ensure proper belt handling ■ Replace belt, tensioner and idler, and if necessary, water pump 	↻
Contamination 	<ul style="list-style-type: none"> ■ Influence of operating fluids, for instance oil, anti-freeze or brake fluid 	<ul style="list-style-type: none"> ■ Eliminate cause, for instance leakage at engine ■ Replace belt 	↻
Damage to belt backing 	<ul style="list-style-type: none"> ■ Surface of the tensioning or idler pulley damaged ■ Foreign particles influence ■ Belt ageing 	<ul style="list-style-type: none"> ■ Replace belt, tensioner and idler, and if necessary, water pump ■ Eliminate foreign particles, check cover and install correctly ■ Replace belt 	↻
Abnormal rib profile wear 	<ul style="list-style-type: none"> ■ Insufficient tension ■ Influence from foreign particles or operating fluids ■ Misalignment ■ Belt pulley defective 	<ul style="list-style-type: none"> ■ Ensure proper fitting and set correct tension ■ Identify and eliminate cause ■ Check axial position and axial parallelism of drive and bearing clearance of rollers and replace if necessary ■ Check belt pulleys and replace if necessary 	↻
Noise 	<ul style="list-style-type: none"> ■ Insufficient or excessive tension ■ Drive overloaded ■ Misalignment ■ Influence from operating fluids 	<ul style="list-style-type: none"> ■ Ensure proper fitting and set correct tension ■ Check rollers, drive components and their bearing clearance and replace if necessary ■ Check axial position and axial parallelism of drive and bearing clearance of rollers and replace if necessary ■ Identify and eliminate cause 	↻

What drives you, **drives us**

Bosch technologies are used in most vehicles worldwide.
People, and assuring their mobility, is what we are focused on.

Therefore, we have dedicated over 130 years of pioneering spirit
and expertise in research and manufacturing to achieving this.

We provide the aftermarket and workshops worldwide with modern diagnostic and workshop
equipment and a wide range of spare parts for passenger cars and commercial vehicles:

- solutions for efficient vehicle repairs
- innovative workshop equipment and software
- one of the world's most comprehensive ranges of new and exchange parts
- large network of wholesale customers, for quick and reliable parts supply
- competent hotline support
- comprehensive educational and training offers
- targeted sales and marketing support

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