

Technical information for front end accessory unit drives — concealed technology ensures quiet operation

Technical background:

The engine combustion cycle accelerates and decelerates the rotary motion of the crankshaft. This rotational imbalance is transferred to the front end accessory unit drive.

As a result, the belt is subjected to strong vibrations (see image 1) causing unpleasant juddering noises. Increased torque fluctuations and extreme forces can occur on the alternator in particular.

Two key pieces of technology have been circulated and tested with the aim of combating these negative effects on the assembly drive:

- 1) Overrunning alternator pulley
- 2) Decoupler

These components will enhance driving comfort, and also improve the service life of belt drive components and fuel consumption.

As these belt pulleys are exposed to wear in the same manner as tensioner pulleys, deflection pulleys and belts, Schaeffler Automotive Aftermarket recommends replacing the overrunning alternator pulley/the decoupler when replacing the components in the assembly drive.



Image 1: Sample assembly drive — Illustration of vibrations caused by the use of a conventional rigid belt pulley on an alternator



Image 2: Rigid belt pulley

Various designs are used depending on the vehicle, engine and equipment. Please refer to our catalogue to ensure you choose the correct overrunning belt pulley.

For a long time, the rigid belt pulley (image 2) was the standard pulley used on an alternator. With a design predating V-ribbed pulleys with one groove, the rigid belt pulleys have been developed further so that they can be used with modern V-ribbed belts with multiple grooves.

The sole function of the rigid belt pulley is to drive the alternator by means of the looped belt.

The belt only needs to be replaced in the event of damage, corrosion or significant wear and tear unless the vehicle manufacturer recommends replacement at a service interval..

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Image 3: Decoupler

- (1) Ball bearing
- (2) Clutch
- (3) Friction bearing
- (4) Torsion spring
- (5) Outer ring with moulded race
- (6) Cover

A decoupler is an alternator belt pulley that powers the alternator by means of a "soft" torsion spring. It absorbs the rotational imbalance, thus preventing torque fluctuations. The dynamic forces on the component bearing points within the assembly drive decrease, while the belt tensioner and the V-ribbed belt are protected against damage.

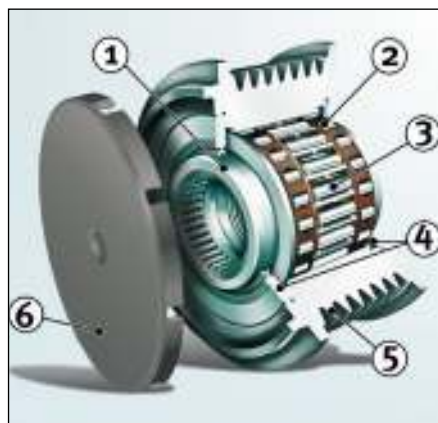


Image 4: Overrunning alternator pulley

- (1) Serrated inner ring
- (2) Radial support bearing
- (3) Overrunning clutch unit
- (4) Seals
- (5) Outer ring with moulded race
- (6) Cover

An overrunning alternator pulley features an overrunning clutch unit. This enables the alternator to be decoupled from the rotational imbalance on the crankshaft and the effects of the alternator's moment of inertia on the assembly drive and the belt vibrations are significantly reduced as a result. The force within the assembly drive is reduced, and the tensioner, pulleys and belts are subjected to smaller loads and have a longer service life.



Image 5: Special tools for fitting and removing different overrunning alternator pulleys

- (1) Tool for various manufacturers, short - Multipoint bit (item no.: 400 0234 10)
- (2) Tool for various manufacturers, short - Torx bit (item no.: 400 0235 10)
- (3) Tool for various manufacturers, long - Multipoint bit (item no.: 400 0200 10)
- (4) Tool for various manufacturers, long - Torx bit (item no.: 400 0201 10)
- (5) Tool for various Volvo alternators - Allen key bit (item no.: 400 0233 10)
- (6) Tool for Hutchinson damper - Multipoint bit (item no.: 400 0231 10)
- (7) Multipoint adapter for various manufacturers (item no.: 400 0215 10)



Note the specifications of the vehicle manufacturer!

Appropriate spare parts can be found in our on-line catalogue at www.Schaeffler-Aftermarket.com or in RepXpert at www.RepXpert.com.

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Technical subject to change

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For further information:

Phone: +44 (0) 14 32 264 264*

Fax: +44 (0) 14 32 375 760

Info@LuK-AS.co.uk

www.Schaeffler-Aftermarket.com

* Calls from within the UK 08457 001100

