



Workshop bulletin: CV accessory drive

Belt damage

Common assumption:

The reason for belt wear and tear lies within the belt itself. The remedy to the problem is replacing the belt.



Caution:

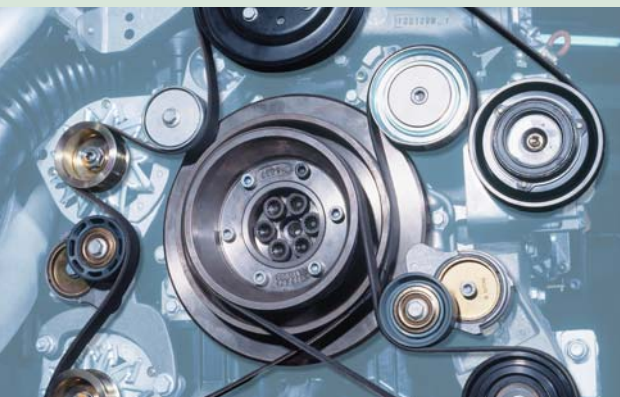
A worn belt can just as much be the result of a defective tensioner or idler pulley, which must be replaced immediately!

Precision and reliability for continuous heavy-duty operation

Belt drive systems on commercial vehicles are subject to permanently high loads. In this demanding environment, the precise interplay of high-quality and professionally installed tensioner and idler pulleys is critical to reliability.

To a large degree, the function of tensioning the belt is determined by the system accessories. Unless replaced, defective accessories will always cause tensioner belt wear.

Function of automatic adjustment systems



- Automatic adjustment of the belt tension, i.e. compensation for tolerances of all drive components
- Compensation for belt elongation and wear
- Compensation for thermal expansion of all drive components
- Minimised belt slip and noise emissions
- Extended service life of the complete belt drive system → and thus of all front-end auxiliaries

How to check and replace ribbed belts

- 1 Disconnect the battery to prevent unintentional engine start-up. Sudden engine start-up while working on the engine compartment can lead to severe personal injury. Attach a sign to the steering wheel saying **“Do not start engine”** (risk of injury).
- 2 Tensioning devices are spring-loaded. Therefore remove them with great care.
- 3 The ribbed belt must be **removed or installed by hand without prying it on or off**. Do not force the belt over pulley edges, nor use a pry.
- 4 On systems with a multiple-stage auxiliary drive (e.g. buses), always replace every **ribbed belt at the same time** and use only belts of the same brand; in addition, check the system tensioners and idlers and replace them if damaged or defective. It is important to check for missing or damaged protective covers. If a cover is missing, the sealing washer of the ball bearing is directly exposed to dirt or water, which is detrimental, eventually allowing moisture to penetrate into the ball bearing. This in turn causes the ball bearing to fail prematurely.

The following belt drive components are easy to replace:



Automatic (self-adjusting) tensioner with protective cover



Hydraulic tensioner with protective steel disk



Smooth steel tensioner pulley



Smooth idler pulley with guide flange



Overrunning alternator pulley with protective cover



Belt tensioner for bus/CV engine

For further information:

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Damage Diagnosis



Bellows damaged!

Damaged part should be replaced, as oil can leak which leads to the loss of the damping function.

Likely cause:

Damaged by screwdriver.



Cage assembly in the bearing melted [1] Cage assembly melted onto inner race [2]

The marks on the idler pulley indicate that its outer race was subject to excessive heat caused by friction of the belt in the belt drive. Due to insufficient belt tension, the belt slipped over the tensioner pulley instead of being driven at the same speed.



Fracture surface at the screw and broken piece

The fastening screw (10.9 grade) has broken away. The marks at the fracture surface indicate that the torque applied to tighten the pulley was too high (overtorqued).



Fatigue at the inner race and corrosion of the parts

The running surfaces of the outer and inner race show clear running marks with signs of corrosion and fatigue at the inner race. The marks on both rollers signal that dirt and moisture have penetrated from the outside.



Tensioner Arm Damage

Possible causes of the damage:

- During installation the tensioning arm has heavily impacted the limiting stop.
- The tensioning pin has been removed prior to mounting the belt.
- Incorrect belt length leads to the tensioning element operating in the critical range. As a result, the limiting stop is exposed to pro-longed excessive forces.
- Depending on the application, the described overloading can also damage interior parts of the tensioner, as a result the correct alignment of the tension roller can no longer be ensured. This leads to lateral belt wear.



Broken aluminium nose

Mounting and dismounting procedure

1. Installation advice for automatic tension rollers

Caution: risk of injury!



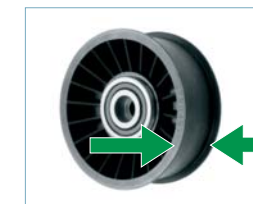
Make sure to install the tensioner and mount the belt correctly, prior to pulling the retaining pin out.



1

2. Installation advice for idler pulleys

Make sure there is no misalignment of the idler pulleys, lateral contact with the guide flange of the idler pulley leads to belt wear and can eventually cause the belt to fail.



2

3. Installation advice for multiple-groove tension rollers

Ensure parallel alignment of the ribbed belts which drive the tensioner pulleys and the ancillary pulleys (misalignment).



3



4. Installation advice for hydraulic belt tensioners

Use an appropriate setting gauge (arrow) or refer to the manufacturer's setting values to set the required pre-tension. Very important, after fitting the unit but before fitting the belt, carefully (without undue side load) cycle the tensioner through its range a few times to „prime“ the hydraulic damper.



4



Maintenance and replacement advice

In commercial vehicles the belt pulley operates under the most extreme conditions. In an environment of high temperature and dirt levels, belt drive components are subject to extreme wear.

We therefore recommend that all system components, i.e. tension rollers and idlers, be replaced whenever the belt is replaced, unless other replacement intervals are specified by the vehicle manufacturer.