



# Plastic deformation of the piston in the running-in phase

During the first hours of operation new pistons are subjected to permanent plastic deformation. On most pistons, the piston diameter is reduced by a few 1/100 mm. This process is referred to as skirt failure.

## Technical background

The skirt failure is caused by thermal and mechanical strain on the piston during the first warm-up phase. The reduction of the piston diameter ( $D_{max}$ ) is different depending on the model, material composition and specific stress of the piston.

## What this means in practice

The piston diameter of new pistons must be measured and recorded before installation. If the measured value deviates from the nominal piston diameter stamped on the piston, the piston cannot be used.

Thanks to the plastic deformation when running-in, the original piston diameter can no longer be determined for pistons that have been run in. Complaints relating to the nominal piston diameter can no longer be made for pistons that have been run in.

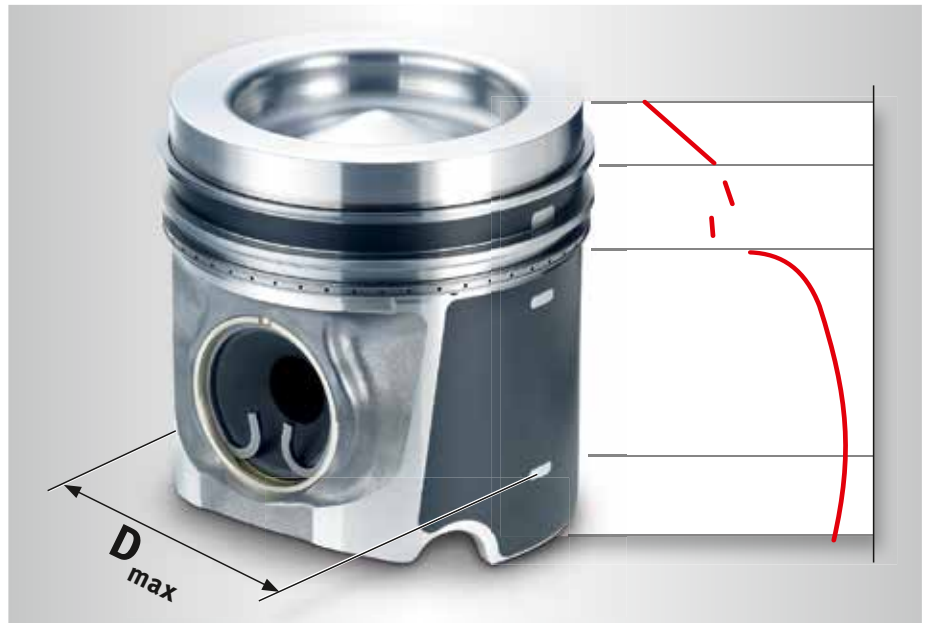


Fig. 1: Exaggerated illustration of the skirt outline and piston diameter ( $D_{max}$ )

## Measuring the piston diameter

The maximum piston size ( $D_{max}$ ) is located in the lower third of the skirt area. Pistons with skirt coatings often have so-called “measuring windows” within the coating. The maximum piston size is calculated at the lower measuring window (Fig. 1).



### Note:

In order to avoid measuring errors, the measuring surfaces of the measuring tool (outside micrometer) cannot be larger than the measuring windows in the coating.

If there are no measuring windows on a coated piston skirt, the piston diameter must be measured directly on the coating. To calculate the exact piston diameter, the double coating thickness (approx.  $2 \times 0.015$  mm) must be subtracted from the measured value.

If the position of the maximum piston size on the piston skirt is not known (piston coating with no measuring windows, uncoated piston), the exact position must be calculated by means of multiple measurements ( $90^\circ$  to the centreline of piston pin).

The right of changes and deviating pictures is reserved.