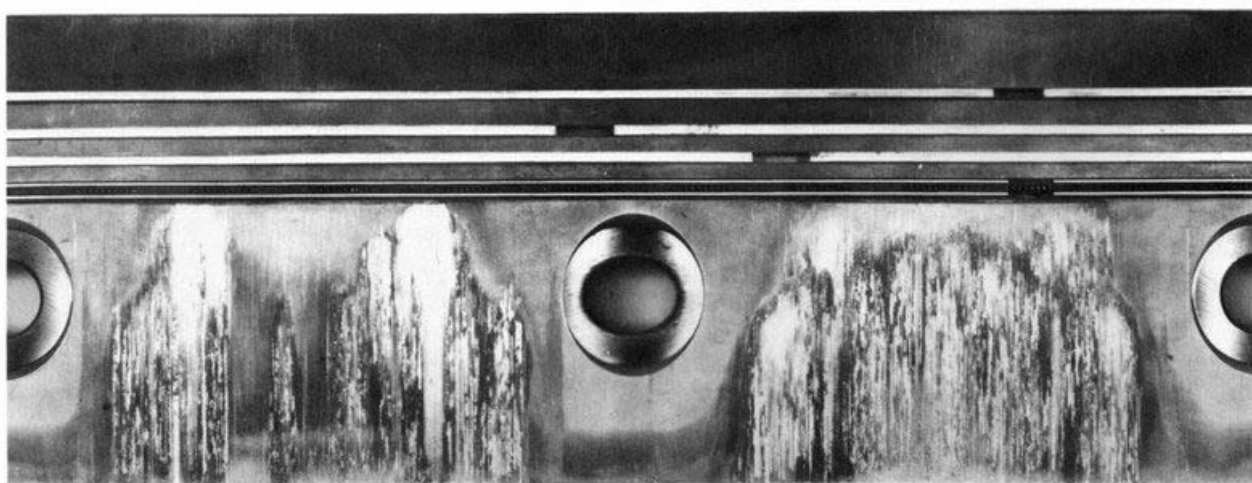


1.1



## 1 Piston Skirt

### 1-1 Seizures on the major and minor thrust sides

**Symptoms** The skirt area of the piston exhibits heavy frictional wear with seizure marks on both the major and minor thrust side. These areas are glossy and partly look as if they are polished; they are concentrated preferably towards the lower skirt end. The ring belt and the piston rings are in good condition.

**Cause and Effect** The piston is machined to such a profile that, at operating temperature, the skirt bears on the cylinder wall throughout its length. If, as in this example, originating from the skirt end, seizures occur on both bearing sides (major and minor thrust sides), it may be concluded that the fitting clearance was too small. Overheating caused by faulty combustion can be ruled out in cases where the section of the top land does not exhibit any seizures, traces of erosion, or melting of the material (see also 2.2.2 and 1.3). This damage occurs after short operation (new condition), since thermal expansion is impeded by the insufficient clearance. Insufficient clearance can also occur if the engine has overheated because of a cooling defect (lack of water, defective radiator valve). (The thermal expansion of the aluminum piston is twice as great as that of the cast-iron cylinder) if, in cases of water shortage, topping-up with cold water is carried out too quickly, this can also cause insufficient clearance, since the cylinder contracts quickly because of the over-rapid cooling while the piston remains hot. If the seizure marks are distributed unevenly around the periphery of the piston, these marks, i.e. piston seizure, may also have been caused by the deformation of the cylinder. So-called "cylinder bright-spots" (localized polished areas) also provide an indication of this. In this case, it must be assumed that the diameter of the cylinder bore was too small after the overhaul.

**Remedy** The correct cylinder dimension must be adhered to by all means. Using the values stamped on the piston crown for skirt diameter and clearance, one can calculate the exact cylinder diameter; this should then be checked before installing the piston.