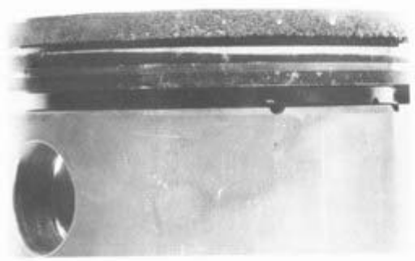
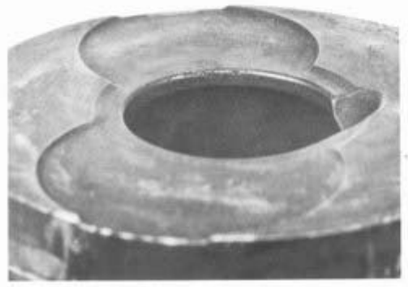
3.7

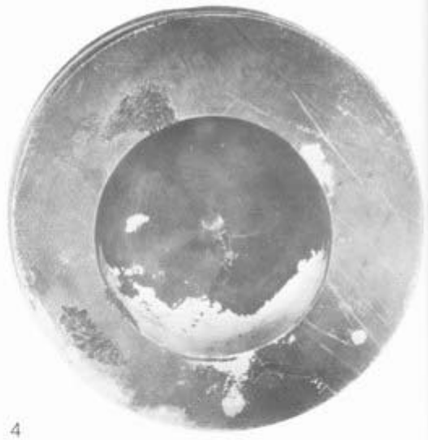


1

2



3



4

3 Piston crown

3.7 Erosion on crown and top land

Symptoms

The pistons in Figures 1 and 2 exhibit erosion-type surface damage in the area of the top land.
In Figure 3, this effect can be seen only on the rim of the combustion cavity, while in Figure 4 it can be seen, additionally, also on the crown.

Cause and Effect

In the interest of clarity, Otto and Diesel engines will be dealt with separately.
Otto engine (Figure 1)
High-frequency compressional vibrations with fast-igniting fuel-air mixture (low octane rating) together with raised temperatures lead to erosion-type surface damage on the crown edge, the top land, and the upper edge of the top ring groove because of "knocking" combustion (see also 2.2.2)..
Diesel engine
Erosion on the crown edge, top land and upper edge of the groove(Figure 2)
An excessive injection quantity, or fuel with insufficient ignition characteristics (cetane rating) leads to damage with a secondary combustion chamber effect.
Erosion on the rim of the combustion cavity (Figure 3)
A spray-over of fuel due to a faulty nozzle ignites on the hot surface of the combustion cavity rim and causes localized erosion of particles of material.
Erosion on the piston crown (Figure 4)
In this case, too, oversprayed fuel has ignited and created a secondary combustion chamber. This occurs particularly in the area underneath the hot exhaust valve (see also 3.2.2).

Remedy

Otto engine
Use only fuel with the recommended octane rating. Check the adjustment of the carburetor or injection equipment as well as the ignition timing regularly.
Diesel engine
Clean or replace the injection nozzles and check that they are seated correctly. Check that the injection quantity and injection timing are set precisely. Use fuel with adequate ignition characteristics (cetane rating).