

Correctly installed fire rings ensure optimal compression and extend the service life of diesel engines.

Cylinder liners with an oil control ring, also known as a fire ring, are often installed in heavily stressed engines. When used in combination with the matching pistons, they effectively reduce the formation of harmful oil carbon deposits.

Function of a fire ring

In diesel engines, oil carbon mainly accumulates on the top land of a piston. Over time, these abrasive deposits can wear out the honing in the cylinder liners. Cylinder liners with a fire ring have an inner diameter that is smaller than that of the cylinder bore. When used in conjunction with a piston with a matching top land diameter, the fire ring scrapes off the oil carbon deposits each time the piston passes through top dead center. If the piston needs to be replaced, the fire ring must therefore be removed beforehand.

Replacing fire rings

Destructive removal: If a new cylinder liner with a fire ring is to be installed, the fire ring can be broken and removed with a chisel worked between the fire ring and the cylinder liner.

Nondestructive removal: If the cylinder liner and fire ring are to be reused, the piston must be moved to bottom dead center by turning the crankshaft. Then, a used piston ring with the same diameter as the cylinder liner is inserted under the fire ring. A feeler gauge can be used to bridge the gap clearance and prevent the piston ring from becoming compressed and sliding over the fire ring. If the cylinder liner is not to be replaced, it must be fixed in place using a hold-down tool. When the crankshaft is turned, it moves the piston in the direction of top dead center, causing it to gently push out the fire ring in the process.



Figure 1: Destructive removal

Figure 2: Nondestructive removal

Figure 3: Cross section in lowered state

Important!

Wherever fire rings have been installed, they must also be replaced. The cylinder liner, fire ring, and piston should always be installed as a set. If only the piston or cylinder liner is replaced, ensure that the new part is designed for fire rings.