

FITTING INSTRUCTIONS

PISTONS

PREPARATION

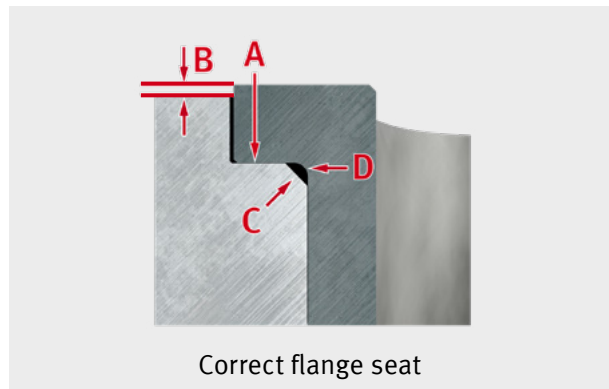
Checking cylinders



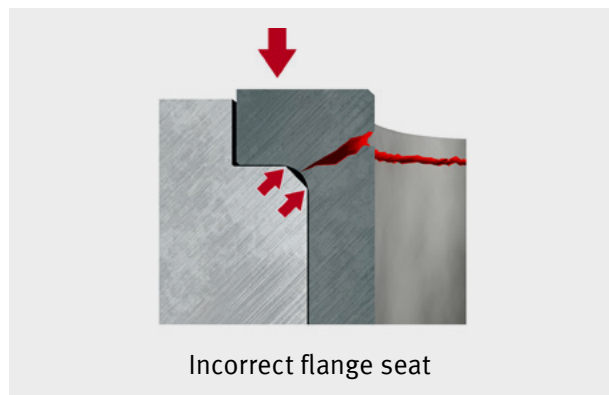
- Clean the cylinder bores and the sealing area carefully.
- Check the surface for cracks and wear marks.
- So that the oil film adheres well to the cylinder surface, it must have the correct roughness. If there is no manufacturer-specific information, you can use the standard values in the table as a guide.
- Check the diameter of the cylinders at the top, middle and bottom, as well as in a longitudinal and transverse direction (at 90° to each other). You can find the recommended cylinder tolerances in the table.

Surface roughness	Cylinder surface before running
R _{pk} (reduced peak height)	0.1 – 0.6 µm
R _a (mean roughness)	0.15 – 0.5 µm
R _{3z} (diagram evaluation)	1.5 – 3.5 µm

Nominal dimension range	Cylinder tolerance to be complied with
Ø 30 – 50 mm	0.011 mm
Ø 50 – 80 mm	0.013 mm
Ø 80 – 120 mm	0.015 mm
Ø 120 – 180 mm	0.018 mm

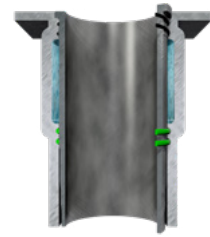


Correct flange seat

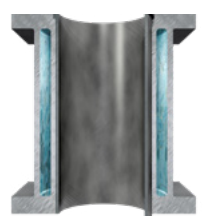


Incorrect flange seat

- For engines with wet cylinder liners:
Clean the surface of the liner flange seat in the crankcase carefully; do not use cutting tools. Flange seat A must be plane-parallel and free of dirt. Treat sealing rings carefully with assembly grease. It must be possible to insert the cylinder liner without great effort. Avoid hard impacts and back and forth movement of the cylinder liner. The liner protrusion B must correspond to the value specified by the engine manufacturer (e.g. 0.05 – 0.1 mm).



- For engines with dry cylinder liners:
Dry cylinder liners are usually larger than the engine block and must be pressed in (press fitting). The bevelled edge C in the housing must correspond to the rounding D on the cylinder liner.



INSTALLATION

General



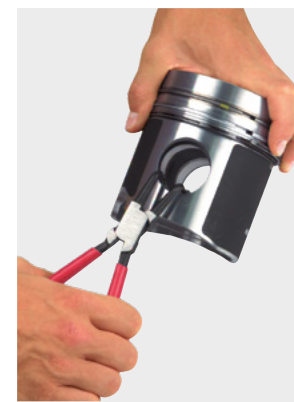
Kolbenschmidt uses preservatives that do not affect the engine oil. Therefore, it is not necessary to clean the pistons. The piston diameter, clearance and direction of installation (e.g. arrow) are indicated on the piston crown. Please note that the cylinder diameter comprises the piston diameter plus clearance.



Measuring points

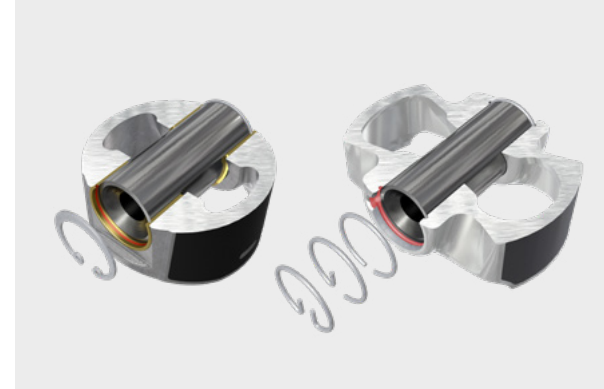
For pistons with a graphite layer, 0.015 – 0.02 mm of layer thickness still needs to be deducted from the measurement to get the stamped skirt dimension. For pistons graphitised according to the screen printing process, measure the skirt diameter only at the specified measuring points – small areas without graphite layer.

Assembly of piston and connecting rod



Before installing the connecting rods they need to be checked for distortion and twisting with a suitable testing instrument. The deviation must not exceed 0.02 mm per 100 mm. Position the piston and the connecting rod according to the direction of installation. The connecting rod eye can then receive the piston pin. The oiled pin is carefully inserted into the pin bores of the piston and into the connecting rod eye of the connecting rod. Avoid jerky movements.

The pin is fixed in place using the circlips provided, which can only be mounted using special pliers. Do not reuse circlips and avoid pressing together excessively, otherwise permanent deformation may occur. Turn the rings slightly to make sure that they have safely engaged in the grooves. Always position the joint of the circlips in the direction of stroke of the piston.



Inserting the piston into the cylinder bore

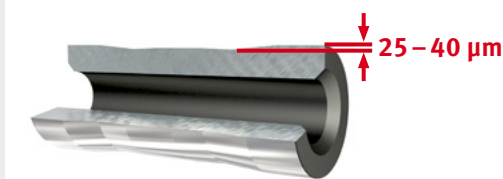


Clean the cylinder block carefully. Make sure that all sliding surfaces are free from dirt and well oiled. Press the piston rings together with a squeeze to enable the piston to glide into the cylinder bore without resistance. For diesel engines, measure the piston protrusion and always adhere to the manufacturer's instructions.

The piston must not be turned in order to adjust the piston protrusion. Pistons with reduced compression height are fitted for adjustment. In most cases, the compression piston dimension is graduated from 0.2 to 0.6 mm.

ATTENTION

If shaped pins are available, please use them.



Mounting piston rings



Kolbenschmidt pistons come ready to install. It is not necessary to mount the rings, which could lead to excessive strain. If you want to install a Kolbenschmidt ring set on a used piston, please use special pliers. Also note that the direction of installation of the rings is indicated with "TOP" ("TOP" must face the piston crown). Napier rings and oil control rings must be installed in such a way that the scraping action is directed towards the bottom skirt end. Make sure that the joint ends of the spiral expander in the oil control ring are always positioned opposite the ring joint.

TEST RUN

Engine test run



Do not start the newly reconditioned engine until it is completely assembled with all add-on assemblies and filled with oil and coolant. Ensure that the engine starts on the first attempt, as the first few revolutions are subject to critical lubricating conditions and decisive for the subsequent operating behaviour of the engine. After warm running of the engine, check it again for tightness, ignition, valve clearance, etc. Then start running the engine in on the test rig or in the vehicle. Operate the engine at a maximum of two-thirds of the engine speed and with moderate load changes. The engine speed can be gradually increased later.

After running-in



The fast-flowing hot oil cleans the engine of all foreign bodies that may still be stuck to it from reconditioning. These particles collect in the engine oil and oil filter. A distance of 50 km is sufficient for most of all dirt particles to accumulate. The engine should not be operated for more than 500 km with the first oil fill.

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