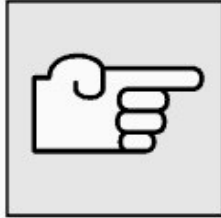


(engine removed)

Removal

Removal of pistons is described separately from installation. Assembly sequence for removal and installation is different.



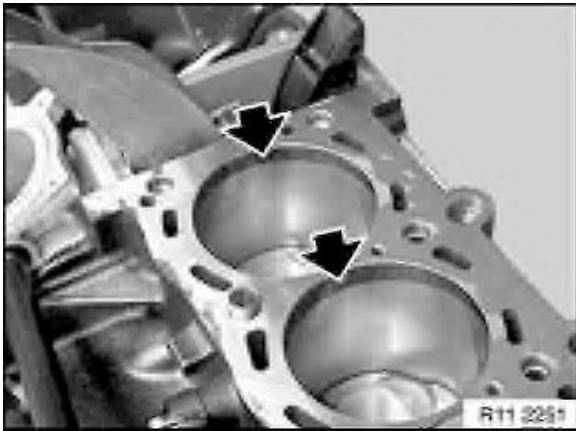
Fit engine to special tool 00 1 450.

- Removing cylinder head
- Removing oil pan
- Removing oil pump

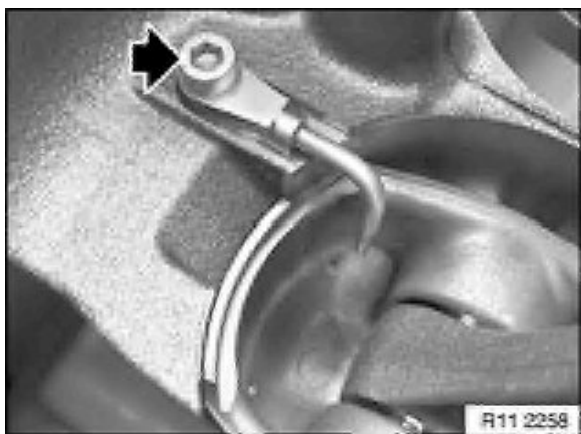


Caution!

Re-install piston, connecting rod and bearing shells back in the same position and in the same installation location.
Conrod and conrod bearing cover are designated with same pair number: do not interchange / confuse.



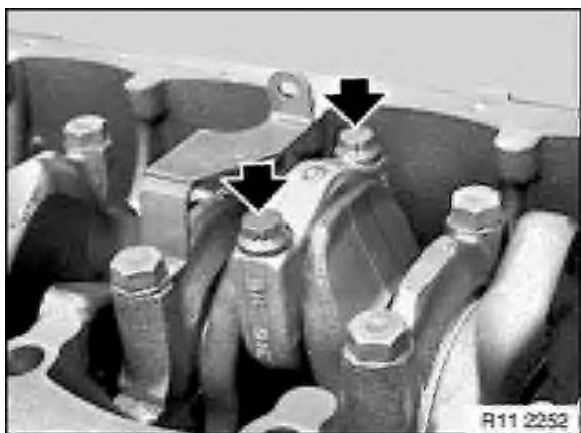
In event of heavy oil carbon residue:
Carefully remove oil carbon residue from cylinder wall.

**Note:**

Piston cooling spray nozzles are installed between the bearing seats.

Check spray nozzles for damage.

If necessary, remove piston-cooling spray nozzles.

**Caution!**

Contrary to the rule for all other BMW engines, the conrod bolts are not allowed to be replaced in the S54 engine.

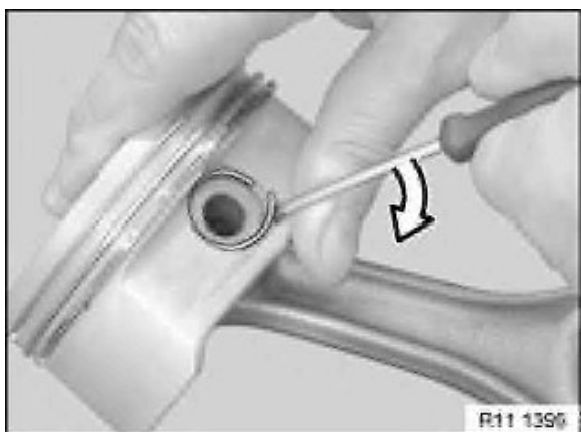
The conrods must be replaced if a conrod bolt is damaged.

Unfasten screws. Remove connecting-rod cover.



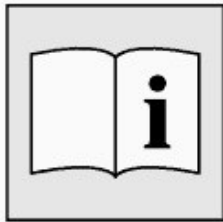
Insert special tool 11 3 480 in conrod.

Remove connecting rod with piston from cylinder-head side.

**Caution!**

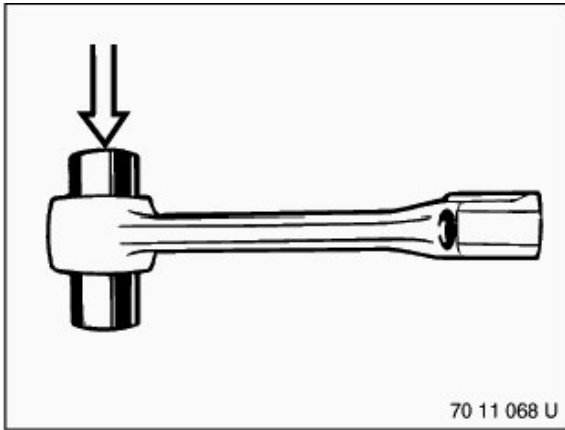
Piston and piston bolts are paired and must not be fitted individually.

Lift out retaining ring and press out piston pin.



Installation

Installation of pistons is described separately from removal. The assembly sequence for removal and installation is different.

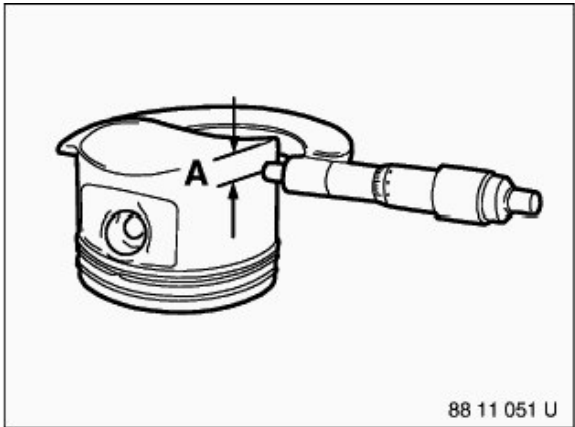


The piston pin must be able to be pressed through the liner by hand with little force and must not display any significant play. If necessary, replace connecting rods.

Note:

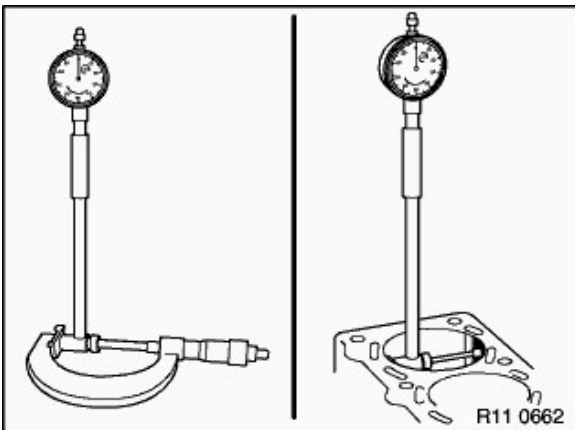
Only conrods of the same weight group are allowed to be installed inside an engine.

The BMW Parts Service only supplies connecting rods in complete sets.



Prior to installation, measure piston installation clearance: Measure piston diameter with micrometer at measuring point A from bottom edge of piston and offset at 90° to the axis of the piston pin.

Measuring point A.

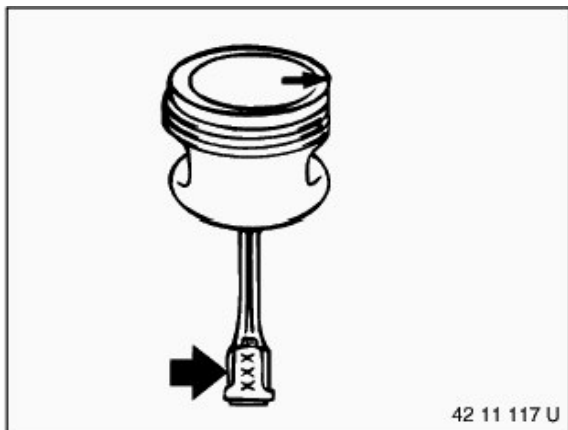


Adjust micrometer to cylinder bore of engine block. Set internal caliper on micrometer to zero. Measure bottom, center and top of cylinder bore in direction of travel and direction of engine rotation.

Diameter of cylinder bore.

Piston installation clearance.

Total permissible wear tolerance.



Caution!

Piston and piston bolts are paired and must not be fitted individually.

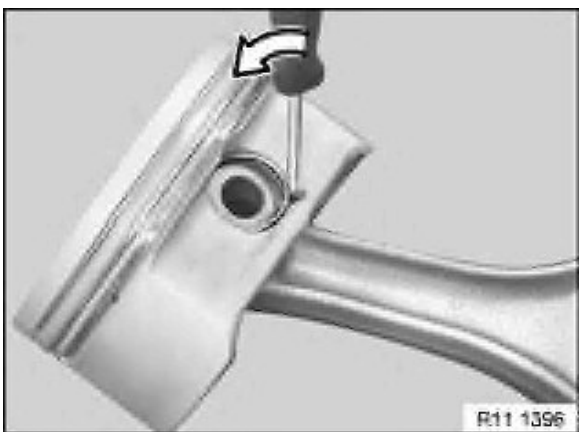
Fit conrod with piston pin to piston in such a way that both of the visible pair numbers on the installation direction arrow on the piston point to the right.



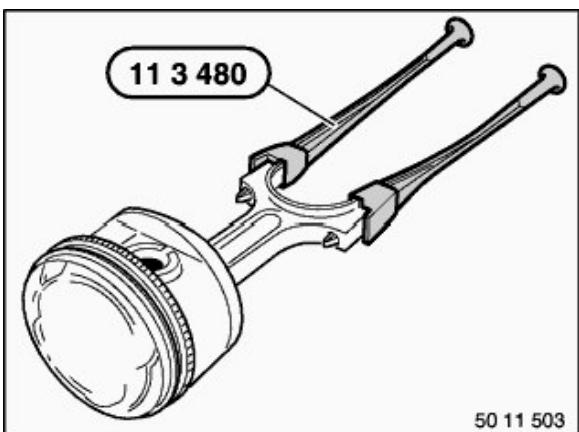
Caution!

The work step Replacing conrod bearings contains important information on the bearing clearance.

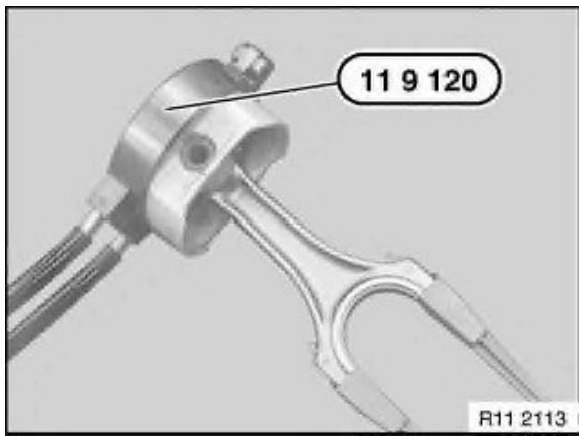
Install conrod bearing.



Install retaining ring.



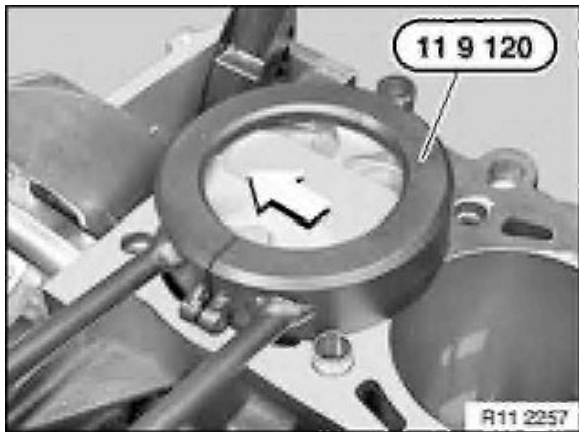
Insert special tool 11 3 480 in connecting rod.



Lightly coat pistons and piston rings with oil.

Offset the contact points of the piston rings by approx. 120° to each other but do not position above the piston pin boss.

Press piston rings together with special tool 11 9 120.



Keep piston rings pressed with special tool 11 9 120.

Install piston so that arrow points to camshaft drive.

Caution!

Danger of piston ring failure.

Only press pistons into place with finger force - do not knock in!



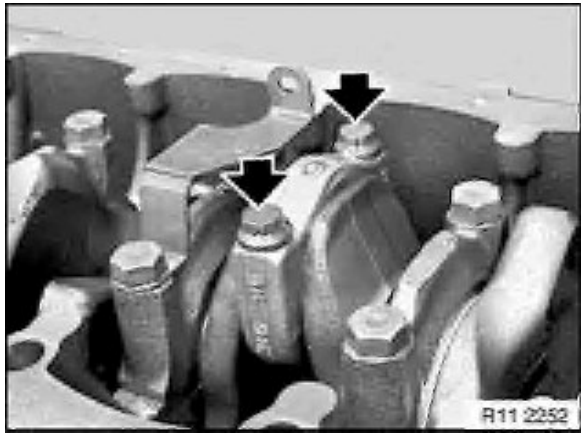
Attach crankpin to connecting rod.

Remove special tool 11 3 480.



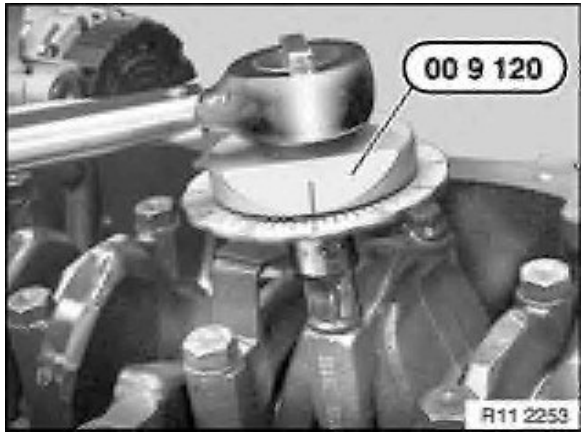
Apply light coat of oil to connecting-rod bearing shells.

Fit bearing caps so that pair numbers match up.



Caution!

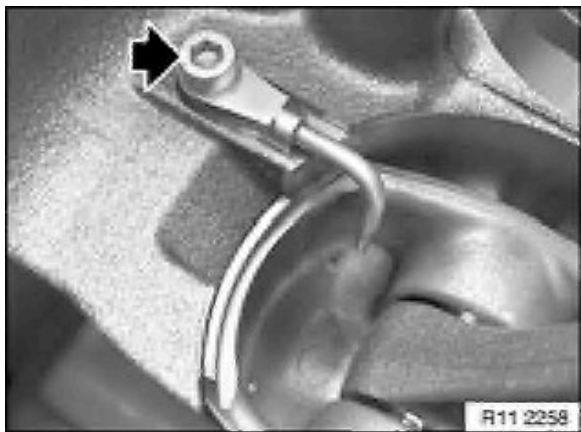
Install the old conrod bolts.



Secure conrod with special tool 00 9 120.

Tightening torque:

- Application torque 5 Nm
- Joining torque 30 Nm
- Angle of rotation 70°



Install spray nozzles for piston cooling, tighten down screw.

Tightening torque, 11 11 7AZ.