Tightening torque 11 23 2AZ. Refer to **ENGINE - TIGHTENING TORQUES** .

Installation:

Fit special tool 11 3 460 on special tool 11 9 451.

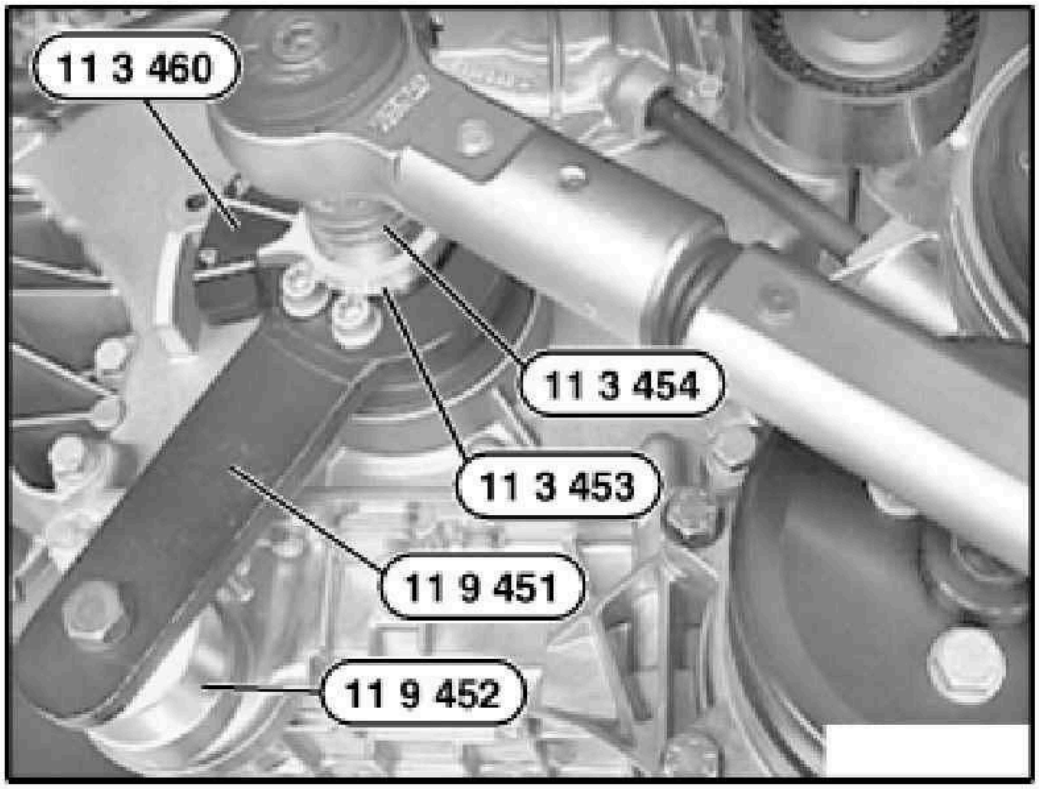

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Fig. 184: Fitting Special Tool (11 3 460) On Central Bolt
Courtesy of BMW OF NORTH AMERICA, INC.

NOTE: Special tool 11 3 460 is magnetic.

Installation:

Select 0° position and secure special tool 11 9 453 with clamping screw on socket (special tool 113 454).

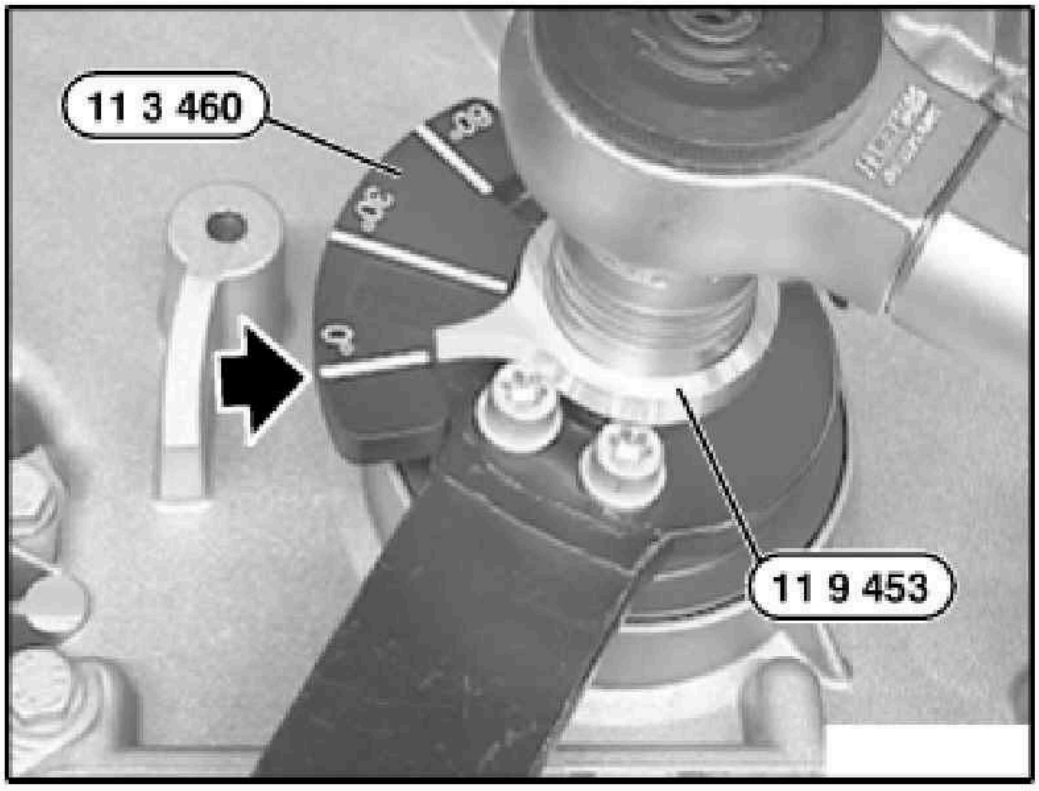

Fig. 185: Securing Special Tool On Socket
Courtesy of BMW OF NORTH AMERICA, INC.

Tighten the central screw with torsion angle.

Tightening torque 11 23 2AZ. Refer to **ENGINE - TIGHTENING TORQUES** .

Assemble engine.

CONNECTING ROD WITH BEARINGS

11 24 571 REPLACING ALL CONROD BEARINGS (N62)

Special tools required:

- 00 2 590
- 00 9 120

- 11 2 110

(piston removed)

IMPORTANT: Note grinding stages on crankshaft. Refer to ENGINE - TECHNICAL DATA .

The letter (1) denotes the crankshaft construction stage.

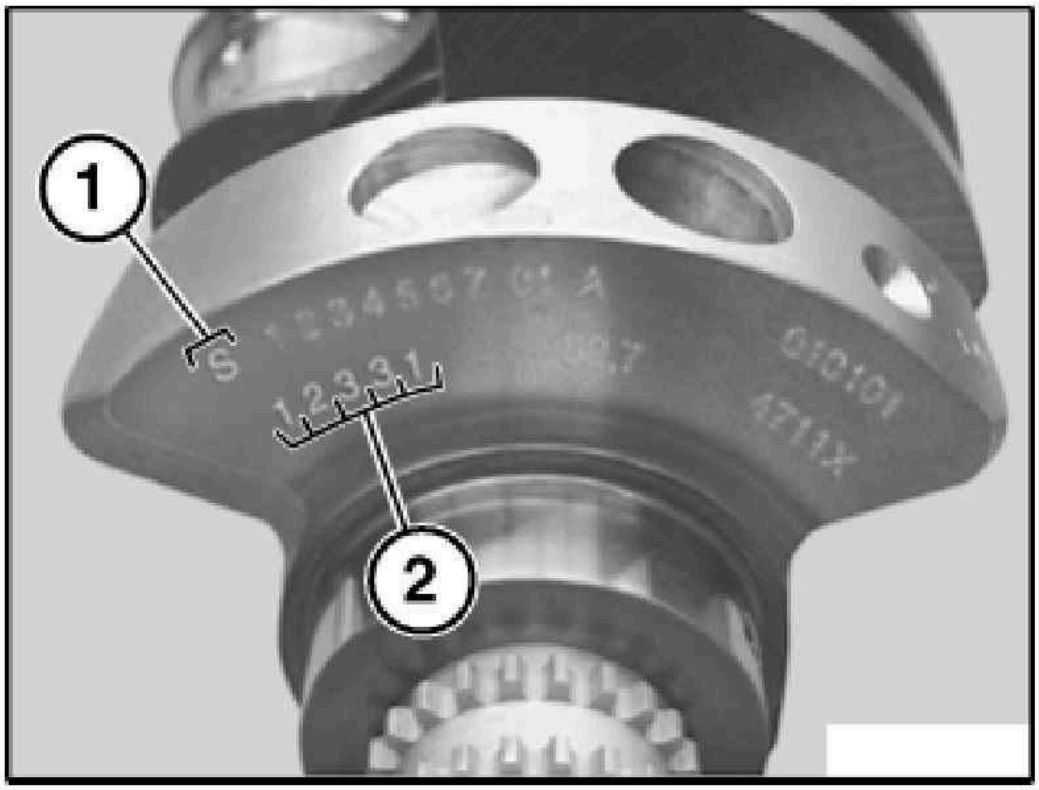

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Fig. 186: Identifying Crankshaft Construction Stage
Courtesy of BMW OF NORTH AMERICA, INC.

The numbers (2) denote the bearing shell classification for the relevant bearing position from 1 to 5 (main bearing cap).

Install new conrod bearing shells.

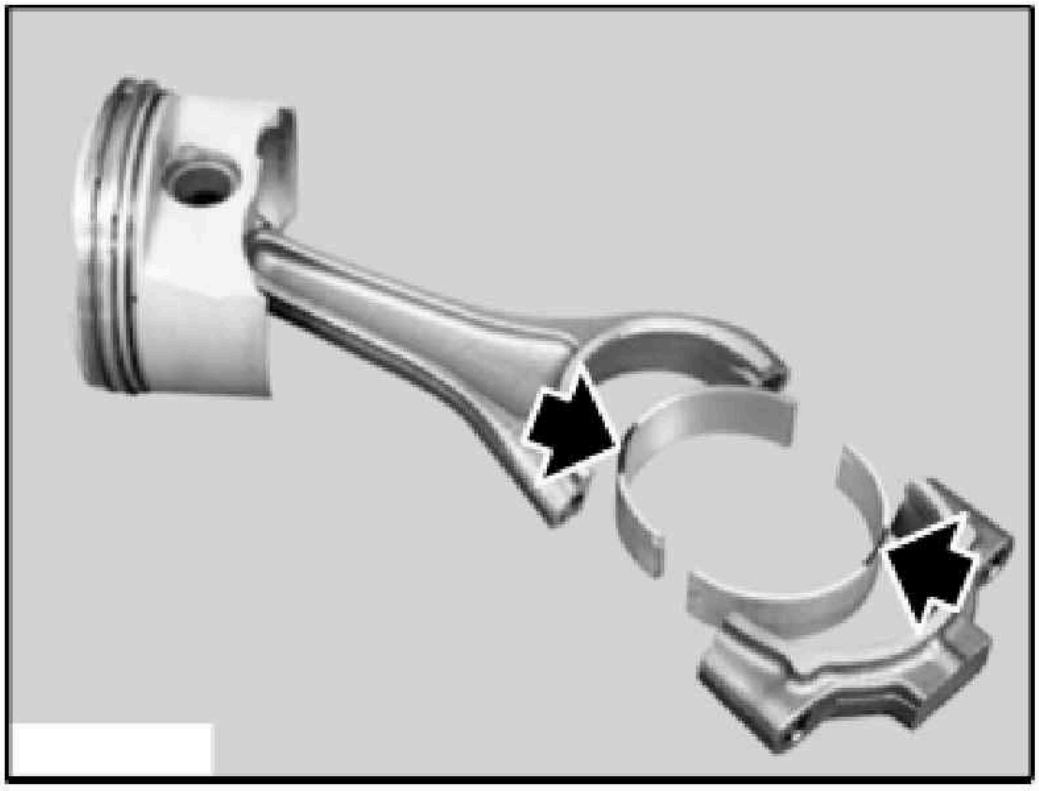

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Fig. 187: Installing New Conrod Bearing Shells
Courtesy of BMW OF NORTH AMERICA, INC.

Insert one red and one blue bearing shell for each conrod.

Install piston. Refer to **11 25 530 Removing and installing/replacing all pistons (N62)**.

Check connecting-rod bearing clearance:

Piston in BDC position.

Fit special tool 00 2 590 (Plastigage Type PG 1) to the oil-free crankshaft.

Position bearing caps so that pair numbers match up.

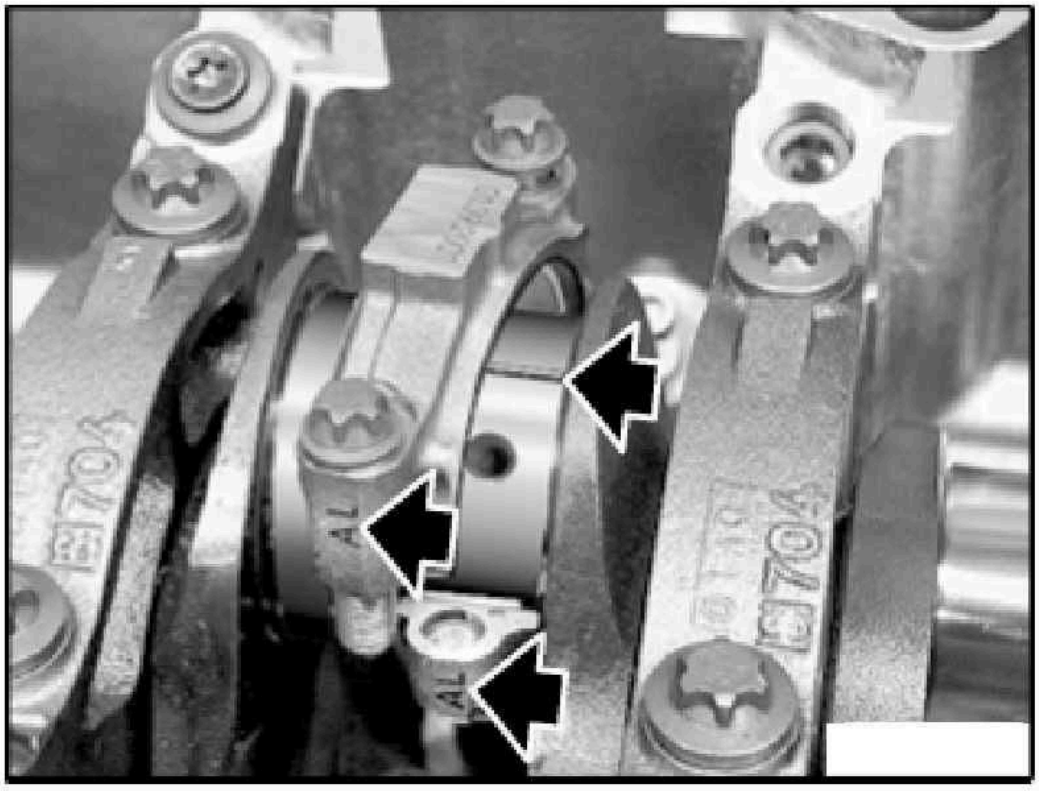

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Fig. 188: Positioning Bearing Caps
Courtesy of BMW OF NORTH AMERICA, INC.

CAUTION: Do not distort conrods or crankshaft.

Use the old connecting-rod bolts to check connecting-rod clearance.

Tighten down conrod bolts with special tool 00 9 120 or special tool 11 2 110.

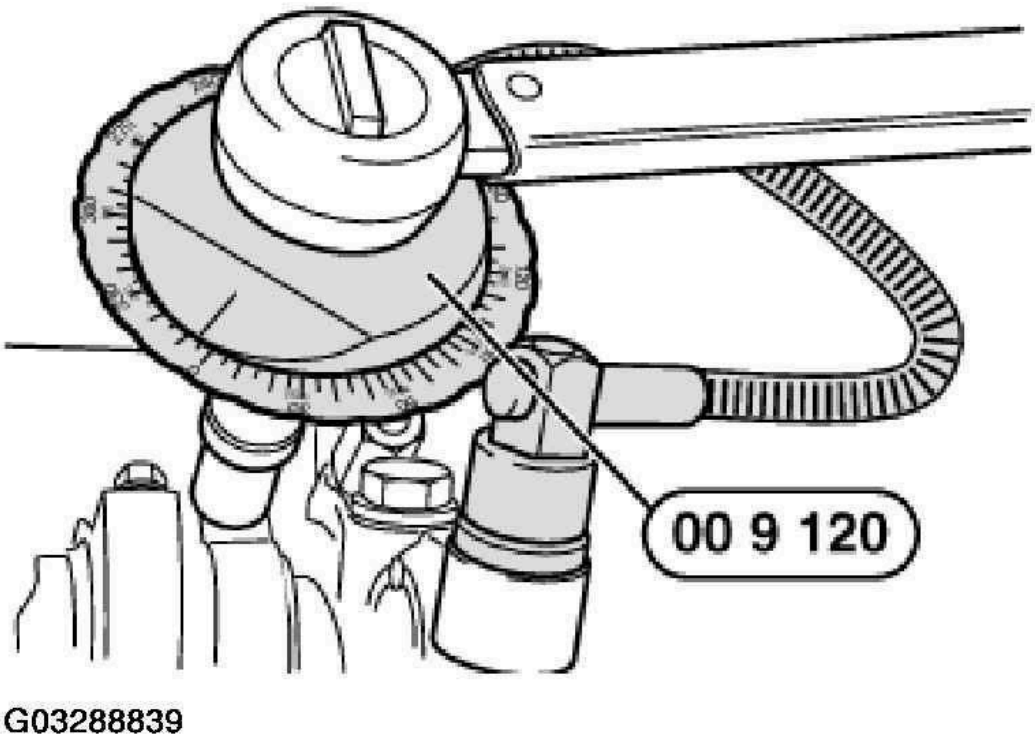

Fig. 189: Tightening Conrod Bolts
Courtesy of BMW OF NORTH AMERICA, INC.

Tightening torque 11 24 1AZ. Refer to **ENGINE - TIGHTENING TORQUES** .

Remove bearing cap and read off bearing play at width of flattened plastic thread with assistance of measurement scale.

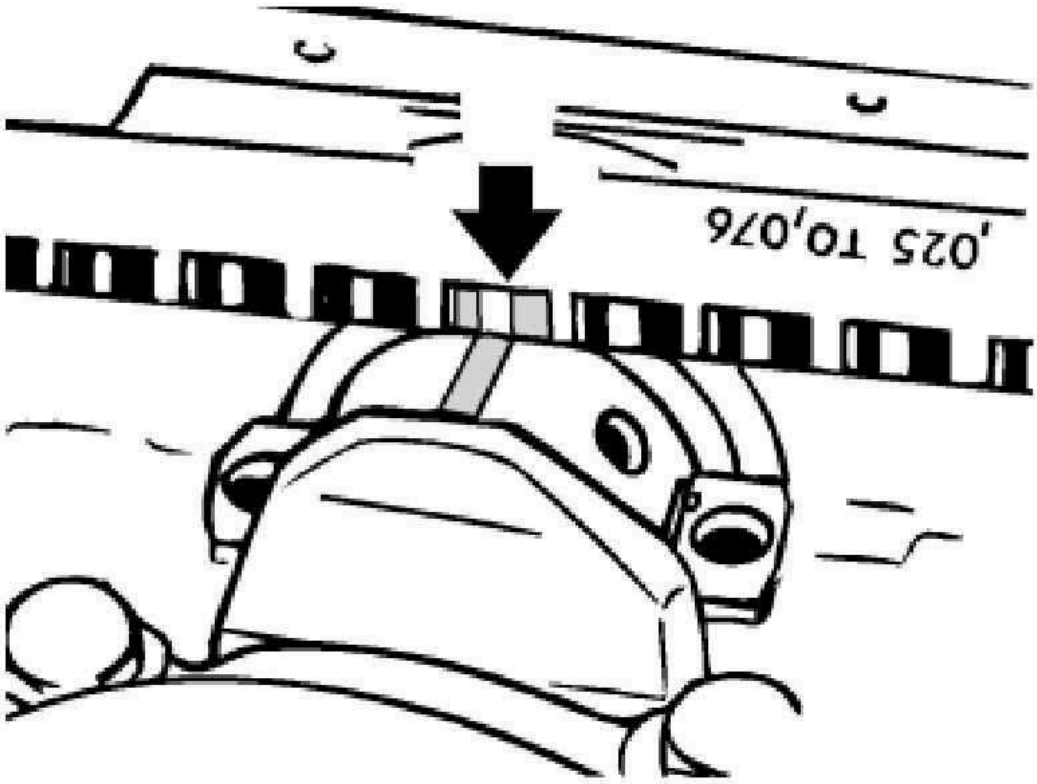

Fig. 190: Measuring Bearing Play
Courtesy of BMW OF NORTH AMERICA, INC.

Conrod bearing clearance. Refer to **ENGINE - TECHNICAL DATA** .

- Remove plastic thread.
- Lubricate crankshaft and bearing shells.
- Install new connecting-rod screws.

Tighten down conrod bolts with special tool 00 9 120 or special tool 11 2 110.

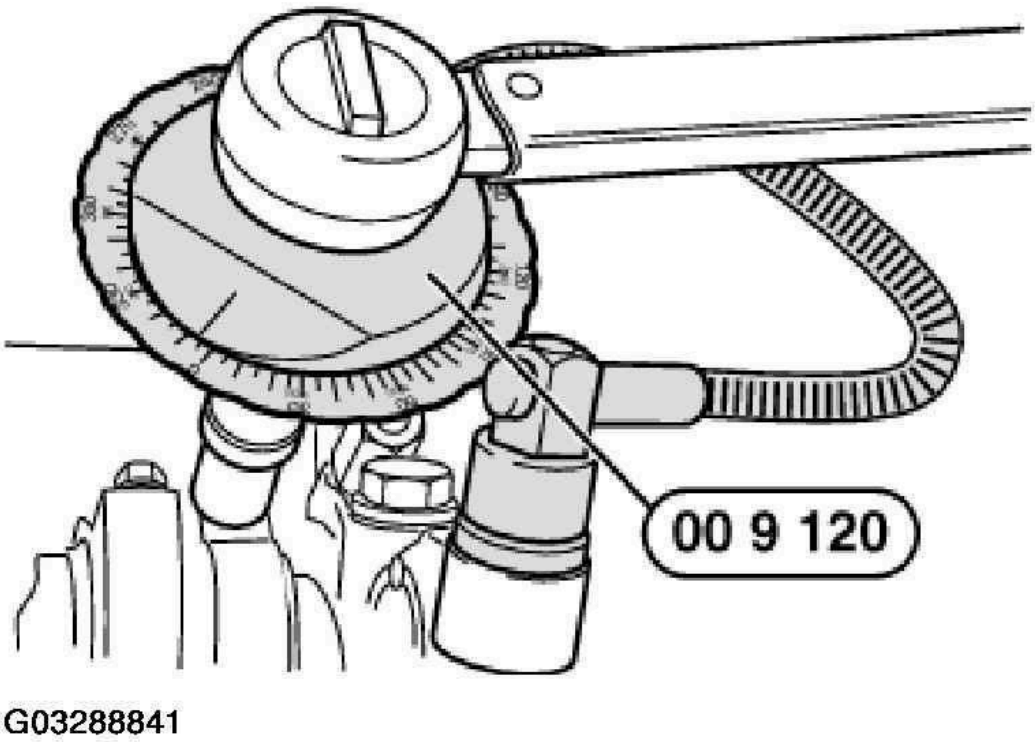

Fig. 191: Tightening Conrod Bolts
Courtesy of BMW OF NORTH AMERICA, INC.

Tightening torque 11 24 1AZ. Refer to **ENGINE - TIGHTENING TORQUES** .

PISTONS WITH RINGS AND PIN

11 25 530 REMOVING AND INSTALLING/REPLACING ALL PISTONS (N62)

Special tools required:

- 00 9 120
- 11 8 141
- 11 8 151
- 11 8 152
- 11 9 500

(engine removed)

Removal

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

Mount engine on assembly stand.

Remove both cylinder heads.

Unscrew oil sump.

Remove oil pump.

CAUTION: Re-install piston, connecting rod and bearing shells back in the same position and in the same installation location.
Conrods and conrod bearing caps are denoted with the same pairing letters, do not mix them up.

In event of heavy oil carbon residue:

Carefully remove oil carbon residue from cylinder wall.

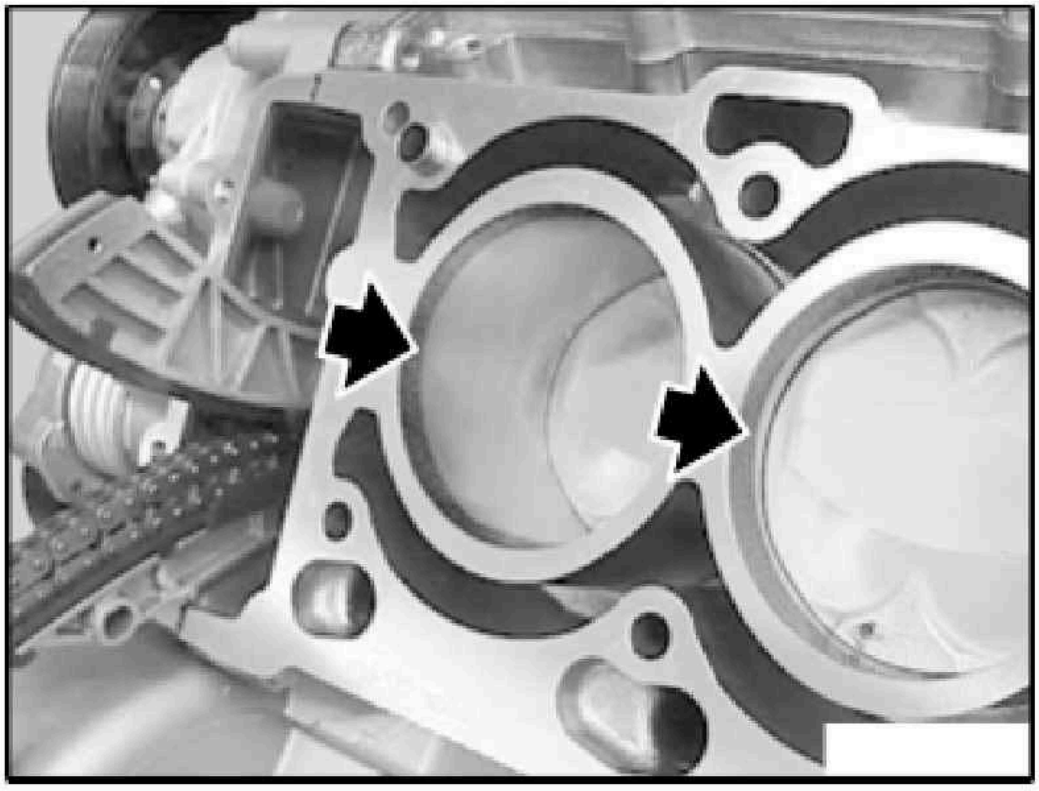

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Fig. 192: Identifying Oil Carbon Residue
Courtesy of BMW OF NORTH AMERICA, INC.

CAUTION: When removing and installing pistons, make sure piston cooling spray nozzles (1) are not damaged.