

**IMPORTANT: Remove crankshaft with aid of a second person.
Weight of crankshaft approx. 25 kg.**

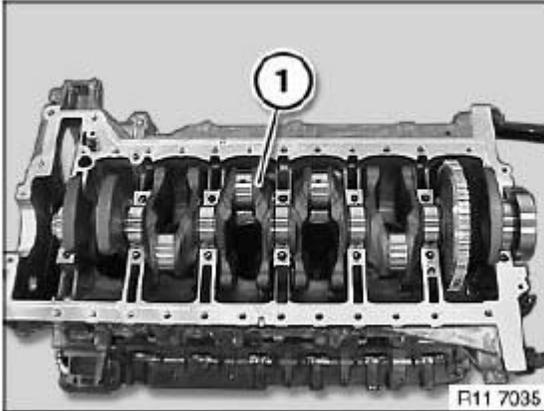


Fig. 110: Identifying Crankshaft
Courtesy of BMW OF NORTH AMERICA, INC.

Tighten steel screws (1 to 14) from inside outwards.

Tightening torque: **11 11 1AZ** .

Tighten screws (2) from inside outwards.

Tightening torque: **11 11 4AZ** .

Tighten screws (1).

Tightening torque: **11 11 2AZ** .

Installation:

Replace aluminum screws.

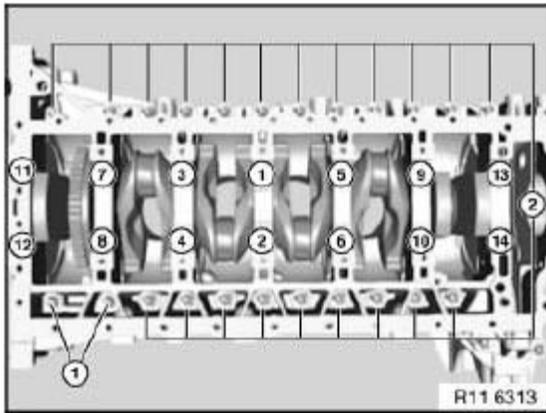


Fig. 111: Steel Screws Tightening Sequence
 Courtesy of BMW OF NORTH AMERICA, INC.

Tighten aluminum screws exclusively with special tool 00 9 120.

IMPORTANT: In the case of aluminum screws, jointing torque and angle of rotation must be observed without fail.

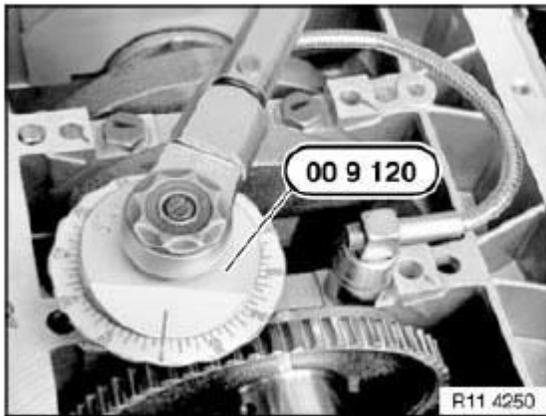


Fig. 112: Tightening Main Bearing Bolts Using Special Tool (00 9 120)
 Courtesy of BMW OF NORTH AMERICA, INC.

Set up stand with magnetic base on special tool 11 4 440.

Set up special tool 00 2 510 on stand.

Position special tool 00 2 510 on crankshaft.

Move crankshaft in direction of arrow.

Determine bearing play.

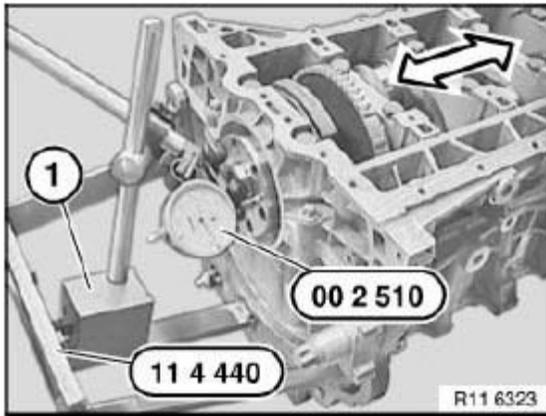


Fig. 113: Moving Crankshaft
 Courtesy of BMW OF NORTH AMERICA, INC.

Drive in both nozzles (1) with special tool 11 9 360 on left and right into crankcase.

Installation:

Always replace nozzles (1).

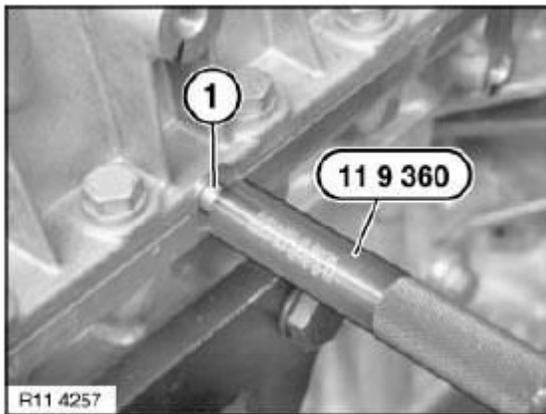


Fig. 114: Driving Nozzles Into Crankcase Using Special Tool 11 9 360
 Courtesy of BMW OF NORTH AMERICA, INC.

Replace radial shaft seal at **FRONT**.

Replace radial shaft seal at **REAR (FROM 1/1/09)** or **REAR (TO 12/31/08)**.

Installation:

Use PRIMER 1.3 AND LIQUID GASKET 1.4.

Prepare liquid gasket (1) in special tool **11 4 370 DEVICE** .

Screw on nozzle for injecting liquid gasket.

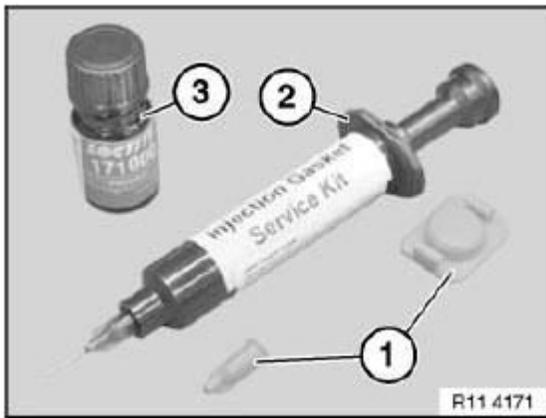


Fig. 115: Identifying Sealing Compound And Bottle Of Injector
Courtesy of BMW OF NORTH AMERICA, INC.

Slowly insert liquid gasket (1) with special tool 11 4 370 in direction of arrow.

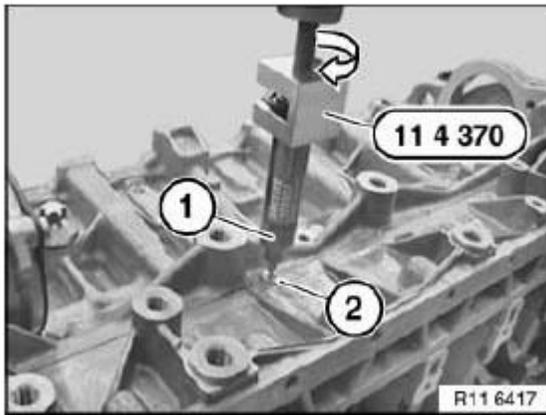


Fig. 116: Inserting Liquid Gasket Using Special Tool (11 4 370)
Courtesy of BMW OF NORTH AMERICA, INC.

Stop (seal off) escaping liquid gasket with primer 1.3.

(Picture shows N40).

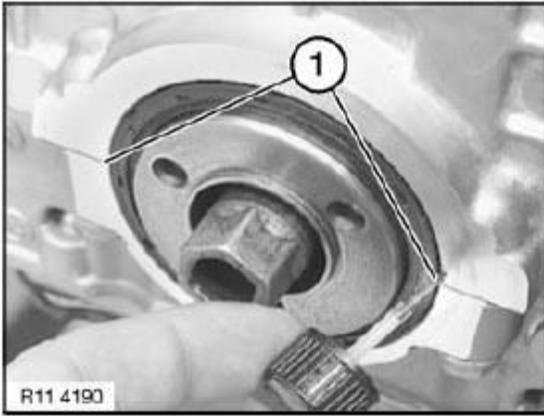


Fig. 117: Inserting Brush Into Groove
Courtesy of BMW OF NORTH AMERICA, INC.

Assemble engine.

11 21 531 REPLACING ALL CRANKSHAFT MAIN BEARINGS (N51)

Special tools required:

For the following special tools, refer to MAINTENANCE AND GENERAL INFORMATION - SPECIAL TOOLS -- 128I .

- 00 2 590

For the following special tools, refer to ENGINE - SPECIAL TOOLS (N51) .

- 11 4 251
- 11 4 252
- 11 4 470

IMPORTANT: Aluminum-magnesium materials. No steel screws/bolts may be used due to the threat of electrochemical corrosion. A magnesium crankcase requires aluminum screws/bolts exclusively. Aluminum screws/bolts must be replaced each time they are released . Aluminum screws/bolts are permitted with and without color coding (blue). For reliable identification: Aluminum screws/bolts are not magnetic . Jointing torque and angle of rotation must be observed without fail (risk of damage) .

Necessary preliminary tasks:

- Remove **crankshaft** . See 11 21 500 REPLACING CRANKSHAFT (N51).

Check setting of oil spray nozzles, adjusting if necessary: