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2009 JEEP Wrangler Unlimited Rubicon OEM Service and Repair Workshop Manual

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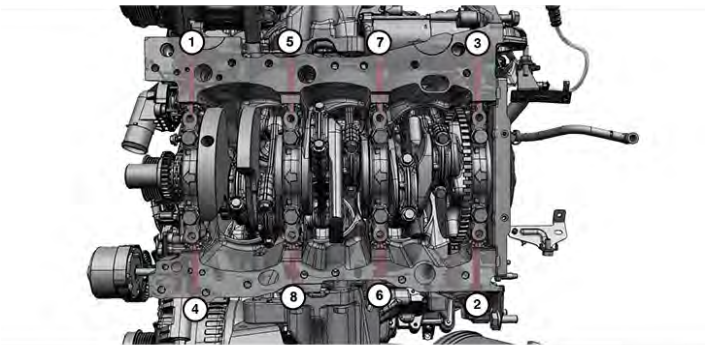
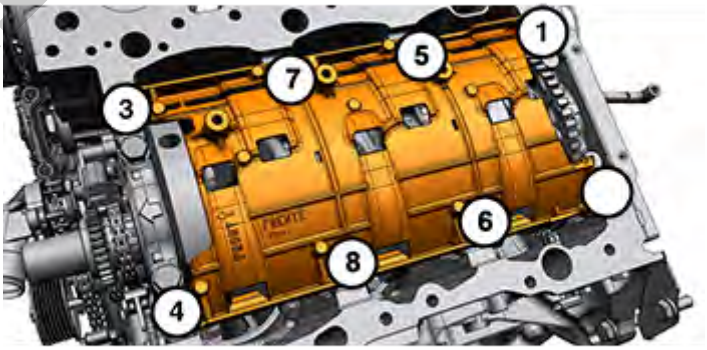
3	Crankshaft Side Main Bearing Cap (Tie Bolt) M8 Bolts	**30 N·m (22 Ft. Lbs.)**	Tightening Sequence  0903189863
4	Piston Oil Cooler Jet to Engine Block Bolt	**6 N·m (63 In. Lbs.)**	–
–	Crankshaft Outer Main Bearing Cap and Windage Tray M8 Bolts	**21 N·m (15 Ft. Lbs.) + 90° Turn**	Tightening Sequence  0903189851
–	Crankshaft Target Wheel to Counterweight Bolts	**11 N·m (8 Ft. Lbs.)**	–

List 3

- 09 - Engine, 2.0L / Lubrication / PUMP, Engine Oil / Removal and Installation
- 09 - Engine, 3.6L / Lubrication / PUMP, Engine Oil / Removal and Installation
- 09 - Engine, 5.7L / Lubrication / PUMP, Engine Oil / Removal and Installation

List 4

- 09 - Engine, 2.0L / Engine Block / Inspection
- 09 - Engine, 3.6L / Engine Block / Inspection
- 09 - Engine, 5.7L / Engine Block / Inspection

List 5

- 09 - Engine, 2.0L / Lubrication / Standard Procedure
- 09 - Engine, 3.6L / Lubrication / Standard Procedure
- 09 - Engine, 5.7L / Lubrication / Standard Procedure

Replace only one main bearing at a time while all other main bearing caps remain properly tightened. If all main bearing caps are removed, the weight of the unsupported crankshaft will damage the crankshaft oil seals.

NOTE

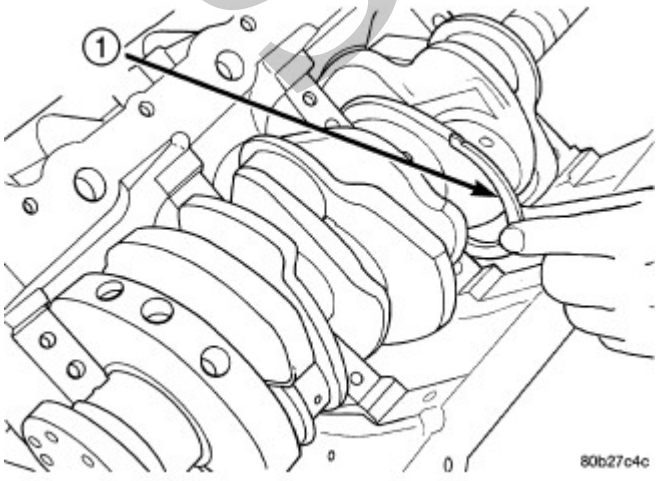
Replace the main bearings in the following order; 2, 3, 1, 4.

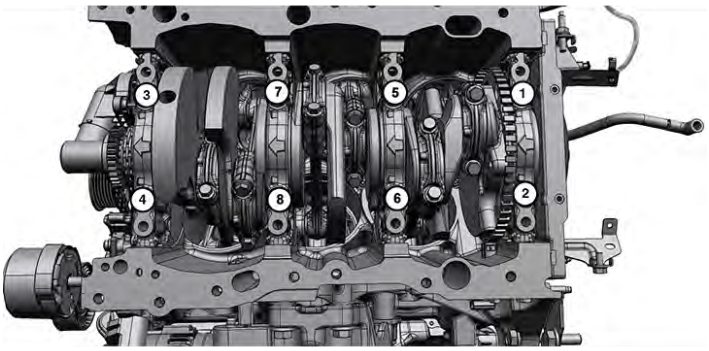
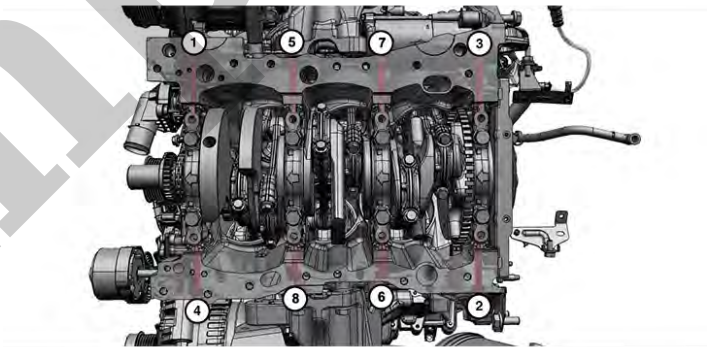
6. Remove the two cap bolts and the main bearing cap.
7. When removing the No. 2 bearing cap, also remove the thrust washers.
8. Slide the upper main bearing half out from between the crankshaft and the engine block.
9. Inspect the crankshaft and bearings for abnormal wear patterns, scoring, grooving, fatigue, pitting and for metal or other foreign material imbedded in the lining (Refer to Engine/Engine Block/Inspection) (Refer To List 4).
10. If required, check the crankshaft bearing clearances by the use of Plasti-gage or equivalent (Refer to Engine/Engine Block/Standard Procedure)(Refer To List 1).
11. If required, select fit new main bearings to the engine block (Refer to Engine/Engine Block/Standard Procedure)(Refer To List 1).

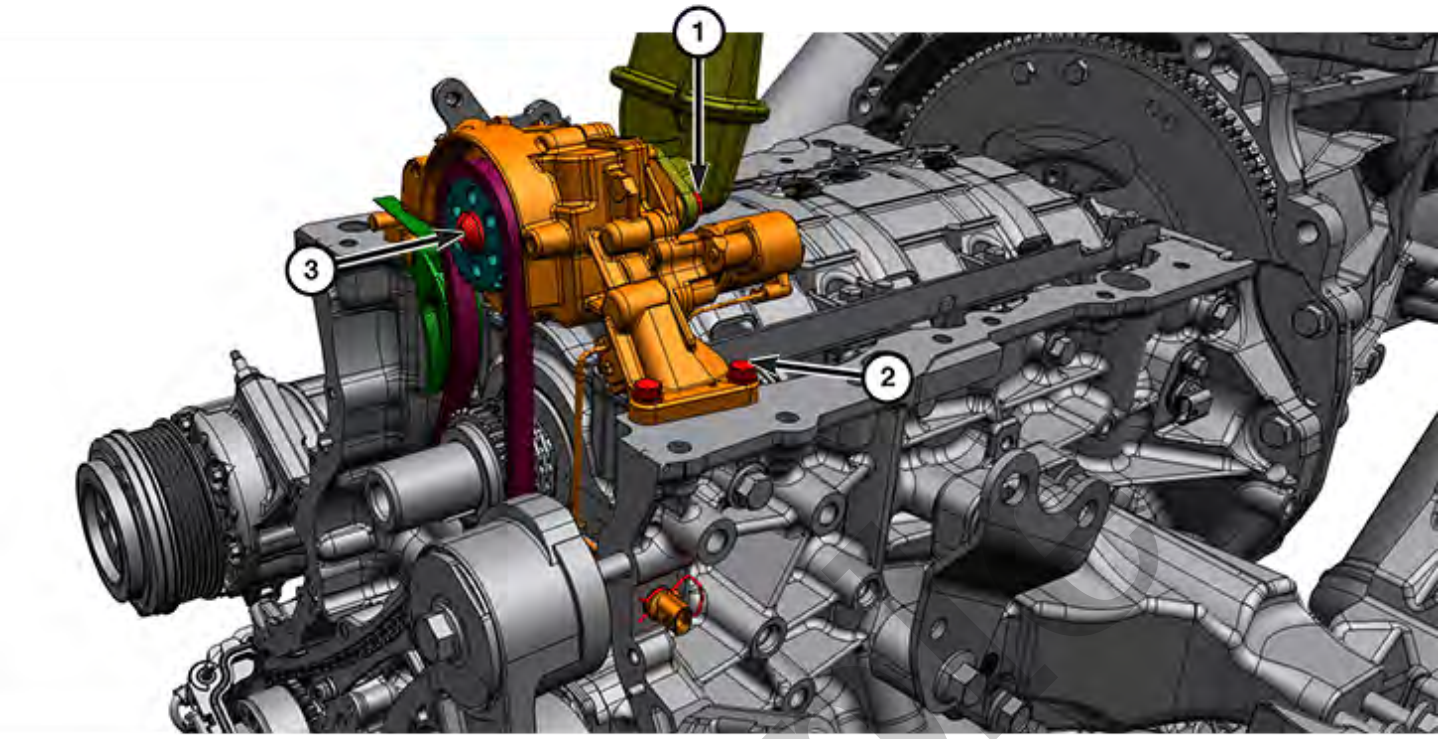
INSTALLATION

1. Lubricate the upper main bearing half with clean engine oil and slide the bearing into position.

Typical V6 engine configuration shown, graphic for reference only.



			
2	Connecting Rod Cap Bolts	**20 N·m (15 Ft. Lbs.) + 90° Turn**	–
3	Crankshaft Side Main Bearing Cap (Tie Bolt) M8 Bolts	**30 N·m (22 Ft. Lbs.)**	Tightening Sequence 
4	Piston Oil Cooler Jet to Engine Block Bolt	**6 N·m (63 In. Lbs.)**	–
–	Crankshaft Outer Main Bearing Cap and Windage Tray M8 Bolts	**21 N·m (15 Ft. Lbs.) + 90° Turn**	Tightening Sequence



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CALLOUT	DESCRIPTION	SPECIFICATION	COMMENTS
1	Oil Pump Pick Up Tube to Oil Pump M6 Bolt	**12 N·m (106 In. Lbs.)**	—
2	Oil Pump to Engine Block M6 Bolts	**12 N·m (106 In. Lbs.)**	—
3	Oil Pump Sprocket M8 Bolt	**26 N·m (18 Ft. Lbs.)**	—

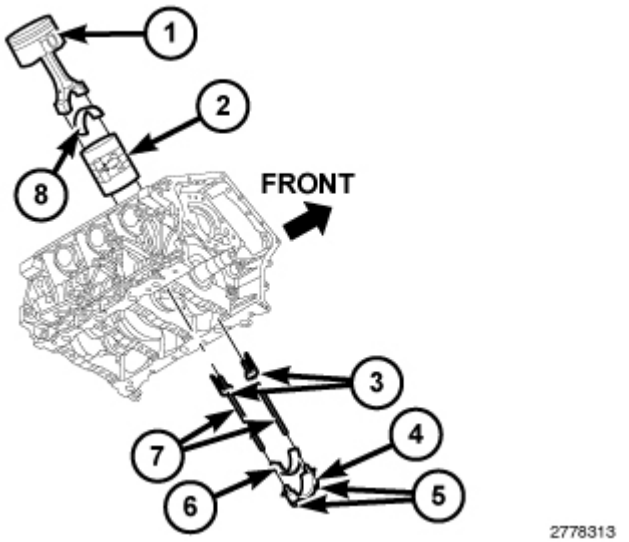
Refer To List:

List 1

- 09 - Engine, 2.0L / Engine Block / Standard Procedure
- 09 - Engine, 3.6L / Engine Block / Standard Procedure
- 09 - Engine, 5.7L / Engine Block / Standard Procedure

List 2

- 09 - Engine, 2.0L / Engine Assembly / Removal and Installation
- 09 - Engine, 3.6L / Engine Assembly / Removal and Installation
- 09 - Engine, 5.7L / Engine Assembly / Removal and Installation



1 - Piston
2 - Piston Ring Compressor
3 - Plastic Guide Plates
4 - Connecting Rod Cap
5 - Connecting Rod Cap Bolts
6 - Bearing Shell
7 - Guide Pins
8 - Bearing Shell

CAUTION

Care must be taken not to damage the fractured rod and cap joint face surfaces, as engine damage may occur.

7. Remove the connecting rod cap bolts and the connecting rod caps. Discard the cap bolts.

8. Remove the plastic guide plates from the Guide Pins

Guide Pins

12. Remove the crankshaft from the engine block.
13. If required, remove the four target wheel bolts and the target wheel. Discard the four bolts.

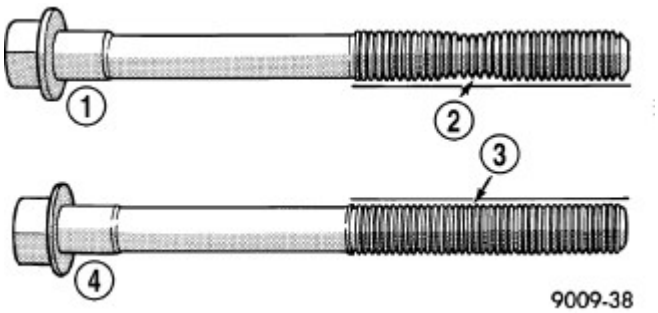
INSTALLATION

1. If required, select and fit new crankshaft main bearings to the engine block (Refer to Engine/Engine Block/Standard Procedure)(Refer To List 5).
2. If required, select and fit new bearings to the connecting rod (Refer to Engine/Engine Block/Standard Procedure)(Refer To List 5).
3. If removed, install the target wheel to the crankshaft with **NEW** bolts. Ensure the threaded holes in the crankshaft are free of residual thread lock adhesive. Tighten the target wheel bolts to the proper torque specification in table below.
4. If removed, lubricate and install the upper main bearing halves into the engine block.

CAUTION

When installing the crankshaft, use care not to damage bearing surfaces on the crankshaft.

5. Install the crankshaft into the engine block.
6. When installing the thrust washers at the No. 2 main bearing location, using the following procedure:
   a. Move the crankshaft forward to the limit of travel. Lubricate and install the rear thrust washer by rolling the washer onto the machined shelf between the No. 2 upper main bulk head and crankshaft thrust surface.
   b. Move the crankshaft rearward to the limit of travel. Lubricate and install the front thrust washer by rolling the washer onto the machined shelf between the No. 2 upper main bulk head and crankshaft thrust surface.



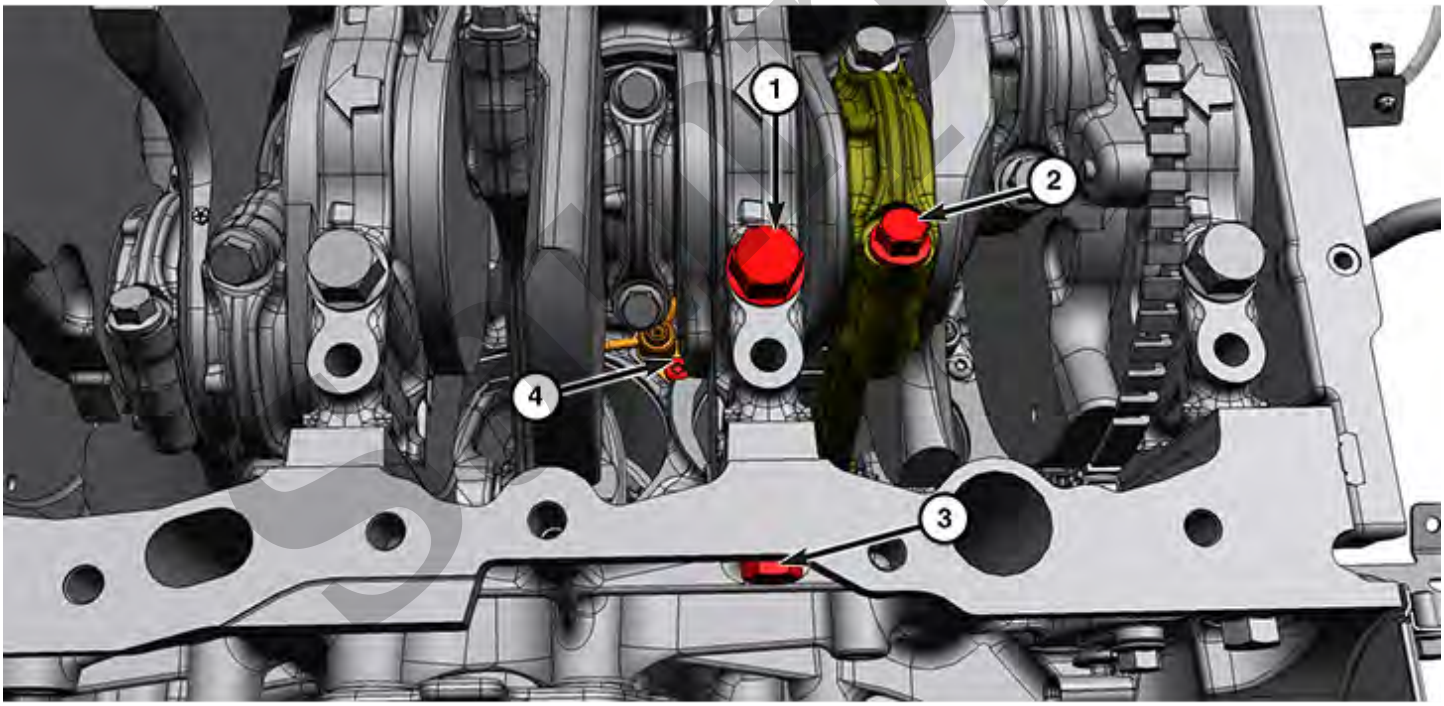
1 - Bolt

24. Install the engine (Refer to Engine/Engine Assembly/Removal and Installation)(Refer To List 1).
25. If removed, install the oil filter and fill the engine crankcase with the proper oil to the correct level (Refer to Engine/Lubrication/Standard Procedure)(Refer To List 6).
26. Operate the engine until it reaches normal operating temperature. Check cooling system for correct fluid level.

NOTE

The Cam/Crank Variation Relearn procedure must be performed using the scan tool anytime there has been a repair/replacement made to a powertrain system, for example: flywheel, valvetrain, camshaft and/or crankshaft sensors or components.

TORQUE SPECIFICATIONS - ENGINE BLOCK



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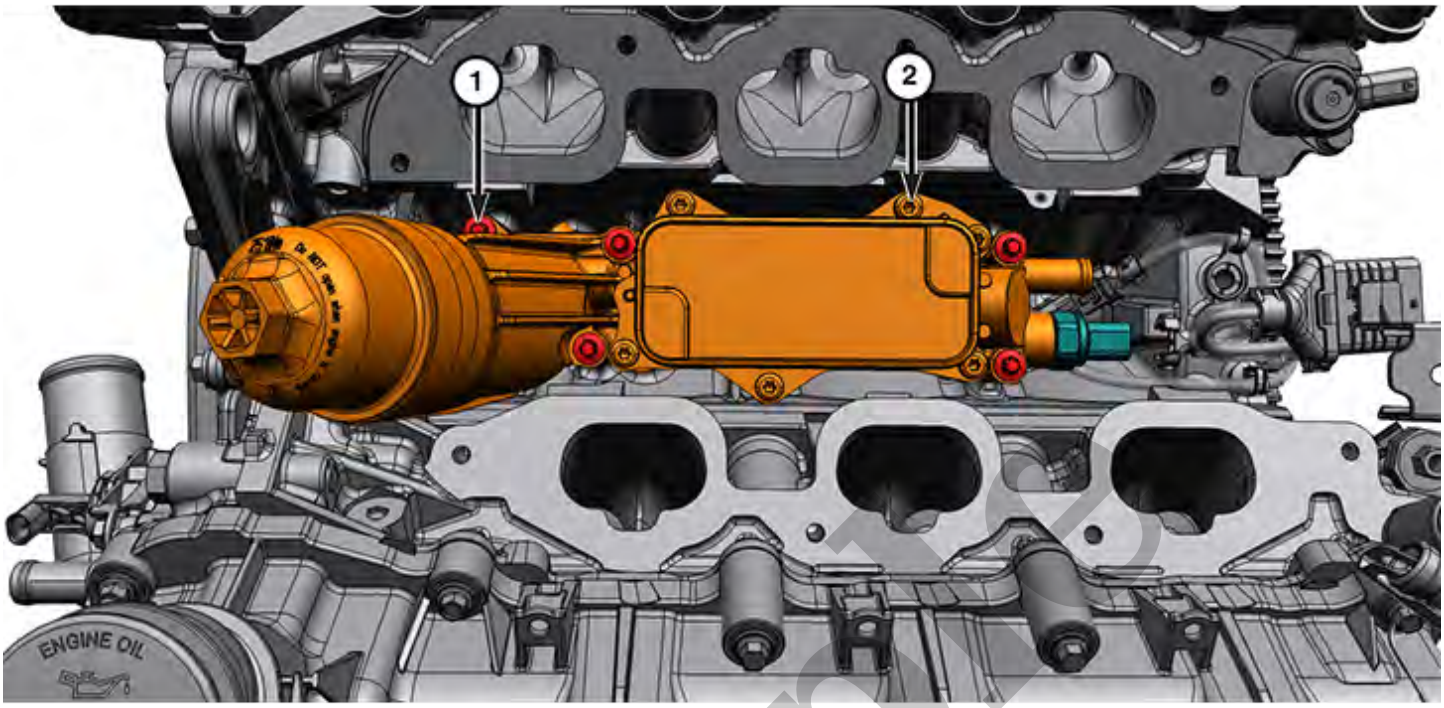
CALLOUT	DESCRIPTION	SPECIFICATION	COMMENTS
1	Crankshaft Inner Main Bearing Cap M11 Bolts	**20 N·m (15 Ft. Lbs.) + 90° Turn**	Tightening Sequence



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CALLOUT	DESCRIPTION	SPECIFICATION	COMMENTS
1	Oil Filter Housing/Oil Cooler to Engine Block M6 Bolts	**12 N·m (106 In. Lbs.)**	—
2	Oil Cooler to Oil Filter Housing Screws	**12 N·m (106 In. Lbs.)**	—
–	Oil Filter Housing Cap	**25 N·m (18 Ft. Lbs.)**	—