

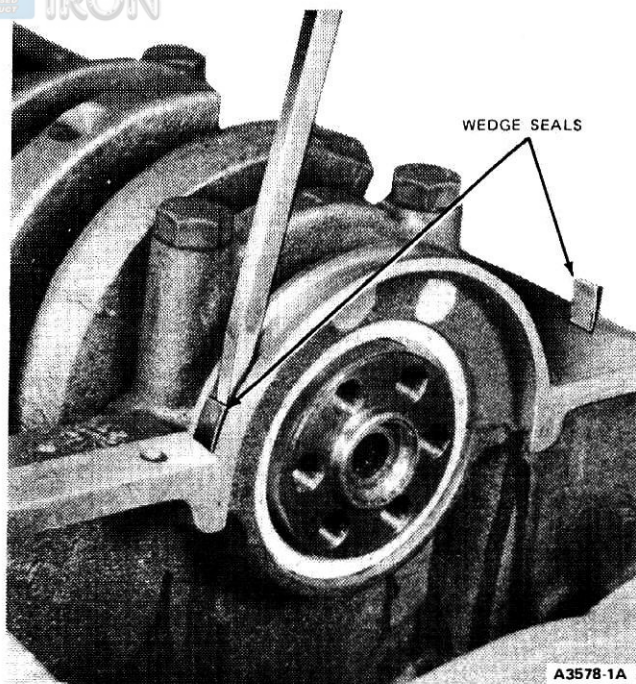


FIG. 38 Replacing Rear Main Bearing Cap Wedge Seals

CONNECTING ROD BEARINGS

The connecting rod bearings are selective fit. Refer to procedures under Fitting Main and Connecting Rod Bearing with Plastigage, Part 21-01.

Removal

1. Drain the crankcase. Remove the oil pan and related parts.
2. Remove the oil pump.
3. Rotate the crankshaft until the connecting rod in which the bearings are to be fitted, is at the bottom.
4. Remove the bearing cap from the rod, then remove the bearing inserts.

Installation

1. Make sure bearing inserts and bearing bore in connecting rod and cap are clean. Foreign material under inserts or between rod and cap will distort the bearing and cause premature failure.
2. Clean the crankshaft journal.
3. Install the bearing inserts in the connecting rod and cap with the tangs fitted in the slots provided.
4. Pull the connecting rod assembly down firmly on the crankshaft journal.
5. Select fit the bearing following procedures in Part 21-01.
6. After the bearing has been fitted, clean and apply a light coat of engine oil to the journal and bearings. Install the connecting rod cap. Tighten the nuts to specification.
7. Clean the oil pump inlet tube screen. Prime the pump by filling the inlet opening with oil while rotating the shaft until oil emerges from the outlet opening. Install the pump with a new gasket and torque the attaching bolts to specification.
8. Install the oil pan.

9. Fill the crankcase to the correct level with the specified oil. Start the engine and check for leaks.

PISTONS AND CONNECTING RODS

Removal

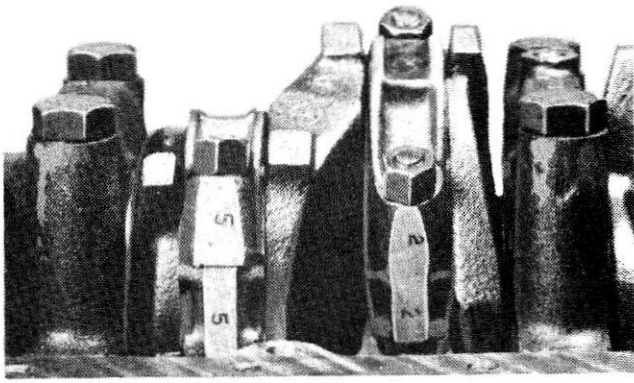
1. Drain the cooling system and the crankcase. Remove the intake manifold, cylinder heads, oil pan and oil pump, following the procedures in this Part.
2. Remove any ridges and/or deposits from the upper end of the cylinder bores as follows:

Turn the crankshaft until the piston to be removed is at the bottom of its travel and place a cloth on the piston head to collect the cuttings. Remove any ridge and/or deposits from the upper end of the cylinder bores. Remove the cylinder ridge with a ridge cutter. Follow the instructions furnished by the tool manufacturers. **Never cut into the ring travel area in excess of 1/32 inch when removing ridges.**

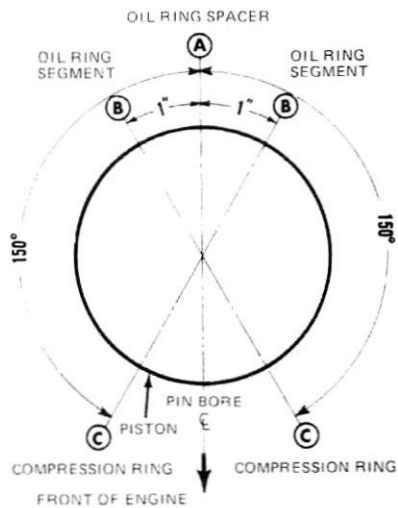
3. Make sure all connecting rod caps are marked so that they can be installed in their original positions.
4. Turn the crankshaft until the connecting rod being removed is down.
5. Remove the connecting rod nuts and cap.
6. Push the connecting rod and piston assembly out the top of the cylinder with the handle end of a hammer. **Avoid damage to the crankshaft journal or the cylinder wall when removing the piston and rod.**
7. Remove the bearing inserts from the connecting rod and cap.
8. Install the cap on the connecting rod from which it was removed.

Installation

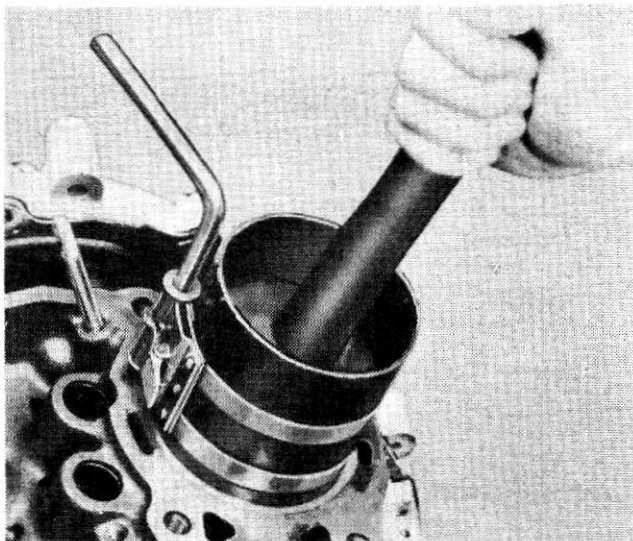
1. If new piston rings are to be installed, remove the cylinder wall glaze using a spring-type honing tool. Follow the instructions of the tool manufacturer.
2. Oil the piston rings, pistons and cylinder walls with light engine oil (SE). **Be sure to install the pistons in the same cylinders from which they were removed or to which they were fitted.** The connecting rod and bearing caps are numbered from 1 to 3 in the right bank and from 4 to 6 in the left bank, beginning at the front of the engine. The numbers on the connecting rod and bearing cap must be on the same side when installed in the cylinder bore (Fig. 39). If a connecting rod is ever transposed from one block or cylinder to another, new bearings should be fitted and the connecting rod should be numbered to correspond with the new cylinder number.
3. Make sure the ring gaps are properly spaced around the circumference of the piston (Fig. 40).
4. Install a piston ring compressor on the piston and push the piston in with a hammer handle until it is slightly below the top of the cylinder (Fig. 41). Be sure to guide the connecting rods to avoid damaging the crankshaft journals. **Install the piston with the indentation notch in the piston head toward the front of the engine (Fig. 42).**



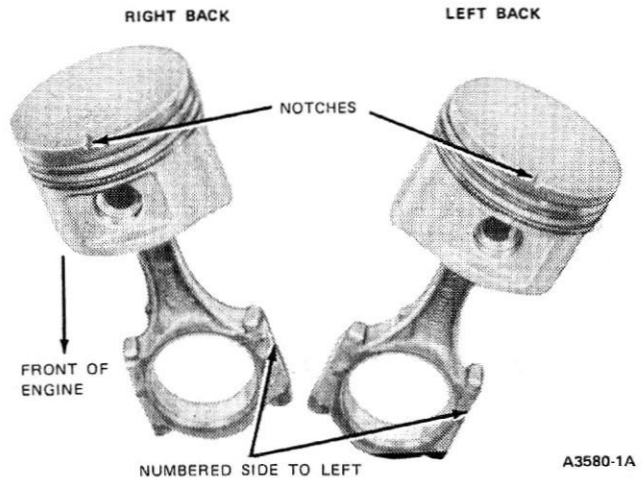
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FIG. 39 Connecting Rod and Cap Numbering

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FIG. 40 Piston Ring Gap Spacing

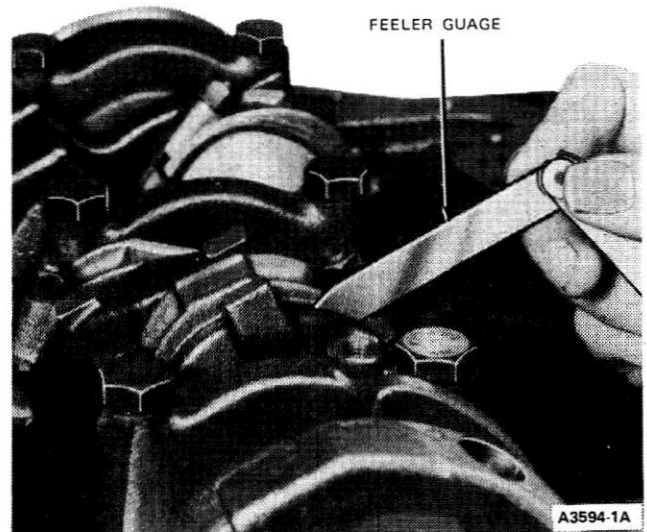
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FIG. 41 Installing Piston

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FIG. 42 Correct Piston and Rod Positions

5. Check the clearance of each bearing following the procedure under Fitting Main and Connecting Rod Bearings in Part 21-01.
6. After the bearings have been fitted, apply a light coat of engine oil (SE) to the journals and bearings.
7. Turn the crankshaft throw to the bottom of its stroke. Push the piston all the way down until the connecting rod bearing seats on the crankshaft journal.
8. Install the connecting rod cap. Tighten the nuts to specifications.
9. After the piston and connecting rod assemblies have been installed, check the side clearance between the connecting rods on each crankshaft journal (Fig. 43).
10. Disassemble, clean, and assemble the oil pump. Clean the oil pump inlet tube screen and the oil pan and block gasket surfaces.
11. Prime the oil pump by filling either the inlet port or outlet port with engine oil and rotating the pump shaft to distribute the oil within the housing. Install the oil pump and the oil pan.



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FIG. 43 Checking Connecting Rod Side Clearance

12. Install the cylinder heads following procedures under Cylinder Head Installation.
13. Install the intake manifold following procedures under Intake Manifold Installation.
14. Fill and bleed the cooling system. Fill the crankcase with the proper grade and quantity of engine oil.
15. Start the engine and check and adjust the ignition timing. Connect the distributor vacuum hoses at the carburetor.
16. Operate the engine at fast idle and check for oil and coolant leaks. When the engine temperature has stabilized, adjust the engine idle speed and idle fuel mixture.
17. Install the air cleaner and intake duct assembly.

CRANKSHAFT

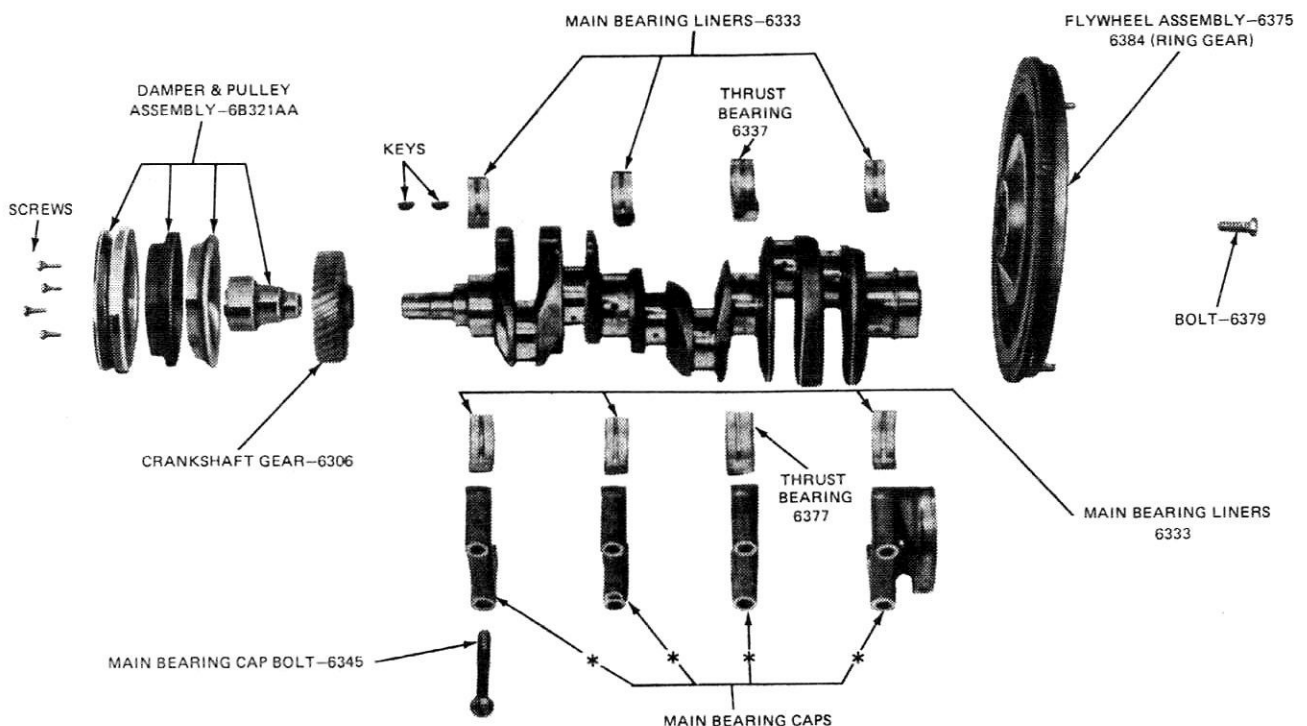
Removal

The crankshaft and related parts are shown in Fig. 44.

1. Remove engine from the vehicle and place on a work stand.
 2. Remove flywheel, flywheel housing and rear plate.
 3. Remove oil pan with engine in normal upright position.
 4. Remove components from front of engine and front cover.
 5. Invert engine and remove oil pump and inlet tube assembly. Leave oil pump drive shaft in position.
 6. Make sure all main and connecting bearing caps are marked so they can be installed in their original locations.
 7. If crankshaft is being replaced, remove gear as shown in Fig. 25.
8. Remove connecting rod nuts and lift off rod cap with bearing insert. Carefully push piston and rod assemblies down in cylinders.
 9. Remove main bearing bolts and lift off main bearing caps with inserts. Discard rear oil seal.
 10. Carefully lift crankshaft out of cylinder block, being careful not to damage the thrust bearing surfaces. Remove bearing inserts from block and identify for position if they are to be re-used.

Installation

1. If crankshaft gear was removed, install it as shown in Fig. 26.
2. Clean the bearing bores in the block and caps and the bearing inserts on both sides. Foreign material under the inserts or on the bearing surfaces may distort the insert and cause bearing failure.
3. Assemble main bearing inserts in their correct location in bearing caps and cylinder block. Check alignment of oil holes in inserts with oil holes in block. Apply a liberal coating of SE-type engine oil to the bearing surfaces. Carefully lower crankshaft into position. Check gear timing marks for correct positioning (Fig. 27).
4. Apply a thin even coating of sealing compound to the rear sealing surface of the rear main bearing cap as shown in Fig. 36. Install main bearing caps in their correct location. The arrows on the front and center main bearing caps must point to the front of the engine.
5. Install and tighten all main bearing bolts finger tight. Then tighten all bolts, except for center thrust bearing, in steps to specifications.
6. Align the thrust bearing surfaces by forcing the crankshaft forward and the thrust bearing cap



*SERVICED IN 6010 BLOCK ASSY.

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FIG. 44 Crankshaft and Related Parts