

Product: TELEHANDLER

Model: TH360B TELEHANDLER SLE

Configuration: TH355B TH360B Telehandler SLE00001-UP (MACHINE) POWERED BY 3054E Engine

Disassembly and Assembly 3054E Engine for Caterpillar Built Machines

Media Number -REN2411-03

Publication Date -01/05/2017

Date Updated -03/05/2017

i05969946

Cylinder Head - Install

SMCS - 1100-012

Installation Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	9U-6238	Guide Bolt	2
B	8T-3052	Degree Wheel	1
C	5P-3975	Rubber Lubricant	-

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

Note: Thoroughly clean the top of the cylinder block and the bottom of the cylinder head. Ensure that there is no debris in the cylinder bores.

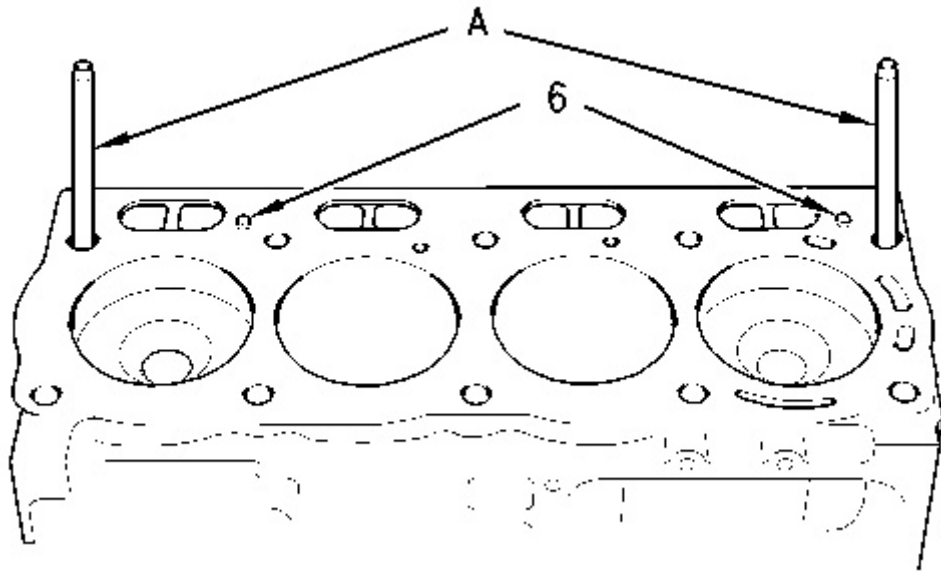
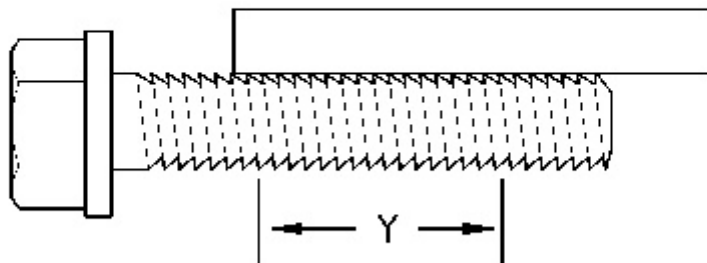


Illustration 1

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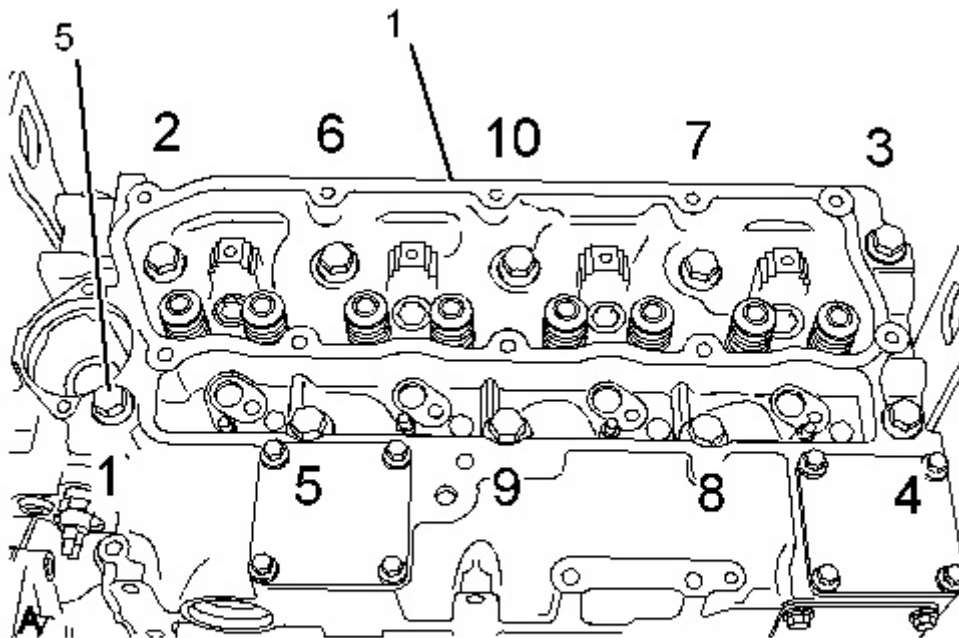
1. Install the cylinder head gasket on dowels (6) on top of the cylinder block.
Note: Do Not use any sealant or compound on the cylinder head gasket.
2. Install Tooling (A) in the cylinder block.
3. Use a suitable lifting device to install the cylinder head. The weight of the cylinder head is approximately 57 kg (126 lb).
Note: Ensure that the cylinder head is positioned on dowels (6) .
4. Remove Tooling (A) .



- Clean the threads of the cylinder head bolts. Inspect the cylinder head bolts.

Note: Do Not use bolts if there is any visual reduction in the diameter of the Threads (Y) that has not been engaged with the cylinder block. Use a straight edge to check the bolts.

- Lubricate the threads and the shoulder of the cylinder head bolts with clean engine oil before installation.



- Install bolts (5) on cylinder head (1) .

Note: The short bolts are installed in holes that are marked 1, 2, 3, 4, 5, 6, and 9.

Note: The long bolts are installed in holes that are marked 7, 8, and 10.

- Tighten the cylinder head bolts in numerical order to a torque of 50 N·m (37 lb ft).
 - Tighten the cylinder head bolts in numerical order to a torque of 100 N·m (74 lb ft).
-

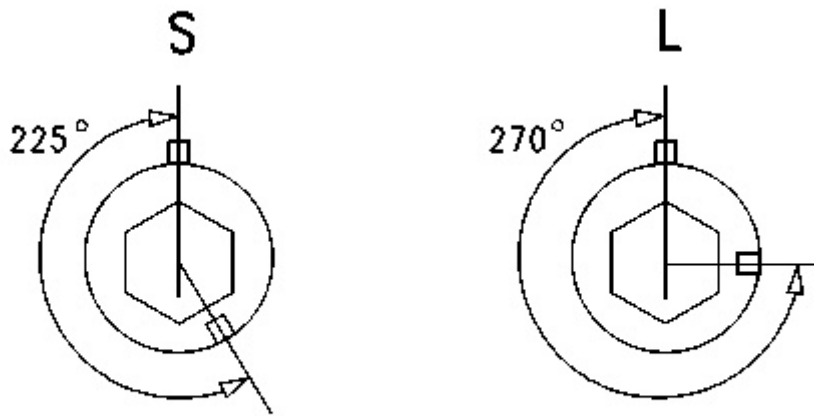


Illustration 4

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10. Use Tooling (B) to achieve the correct final torque.

Note: If Tooling (B) is not used, place an index mark on each bolt.

11. Tighten the cylinder head bolts in numerical order.

- a. Turn the short bolts (2, 5, 6, 7, 8, 9, and 10) for an additional 225 degrees.
- b. Turn the long bolts (1, 3, and 4) for an additional 270 degrees.

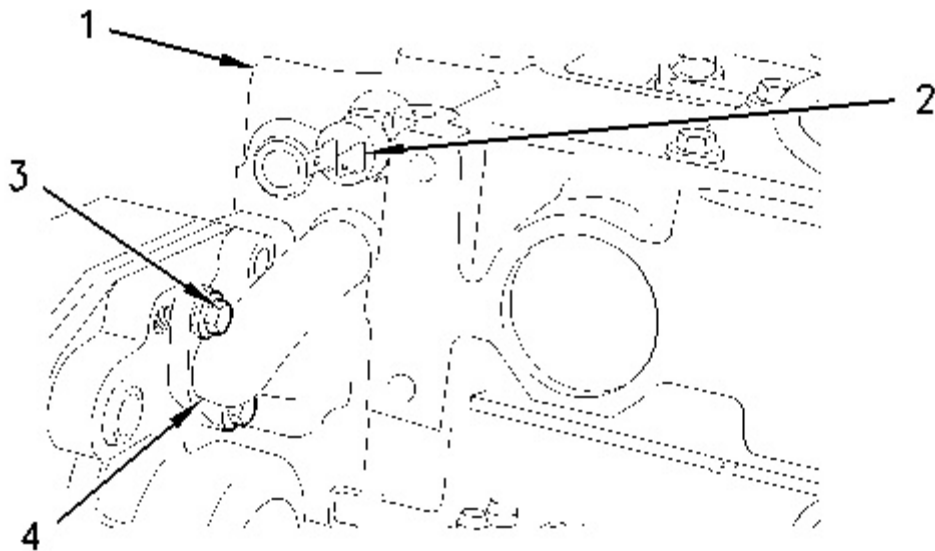


Illustration 5

g01001037

12. Install new O-ring seals on bypass tube (4) . Apply Tooling (C) to the O-ring seals. Install the bypass tube in cylinder head (1) . Install bolts (3) .
13. Connect the harness assembly to coolant temperature sensor (2) .
14. Connect the harness assembly to the bus bar for the glow plugs.
15. Install the upper radiator hose to the water temperature regulator housing.
16. Fill the cooling system with coolant. Fill the lubrication system with engine oil.

Note: Refer to Operation and Maintenance Manual, "Refill Capacities" for the cooling system capacity and the lubrication system capacity of the engine.

End By:

- a. Install the fuel injection lines. Refer to Disassembly and Assembly, "Fuel Injection Lines - Remove and Install".
 - b. Install the rocker shaft and the pushrods. Refer to Disassembly and Assembly, "Rocker Shaft and Pushrod - Install".
 - c. Install the exhaust manifold. Refer to Disassembly and Assembly, "Exhaust Manifold - Remove and Install".
-

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i02333592

Lifter Group - Remove and Install

SMCS - 1209-010

Removal Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	1U-7262	Telescoping Magnet	1

Start By:

- Remove the camshaft. Refer to Disassembly and Assembly, "Camshaft - Remove and Install".

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

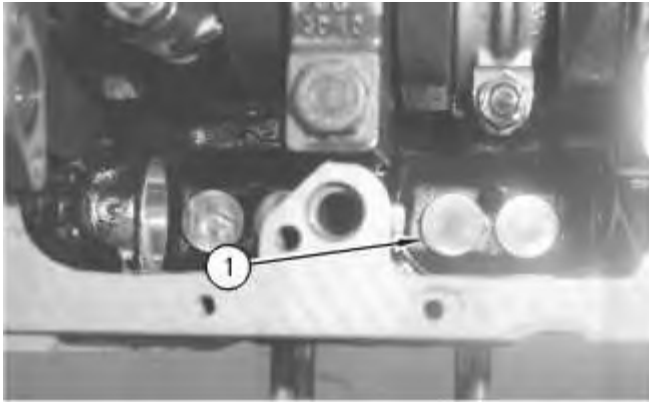


Illustration 1

g00540954

1. Use Tooling (A) to remove lifters (1).

Note: Place an identification mark on the lifters for installation purposes.

Installation Procedure

Table 2

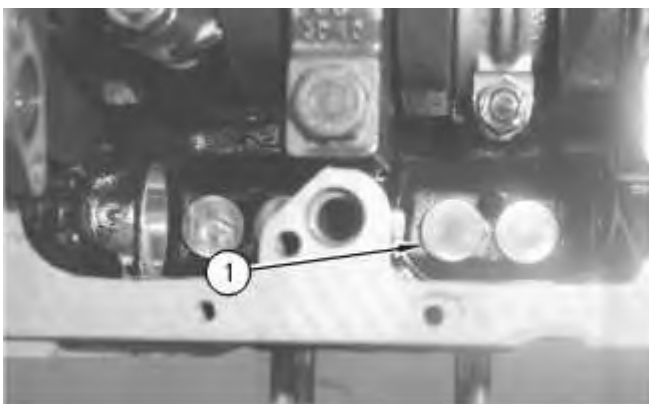
Required Tools			
Tool	Part Number	Part Description	Qty
A	1U-7262	Telescoping Magnet	1

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

1. Lubricate the lifters with clean oil before installing the lifters in the cylinder block.



2. Use Tooling (A) to install lifters (1).

Note: Ensure that the lifters are installed in the original location and that the lifters are seated correctly.

End By:

- a. Install the camshaft. Refer to Disassembly and Assembly, "Camshaft - Remove and Install".
-

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i02299051

Camshaft - Remove and Install

SMCS - 1210-010

Removal Procedure

Start By:

- a. Remove the rocker shaft assembly and the pushrods. Refer to Disassembly and Assembly, "Rocker Shaft and Pushrod - Remove".
- b. Remove the front housing. Refer to Disassembly and Assembly, "Housing (Front) - Remove".

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

1. Turn the engine upside-down so the valve lifters are held in a position away from the camshaft.
-

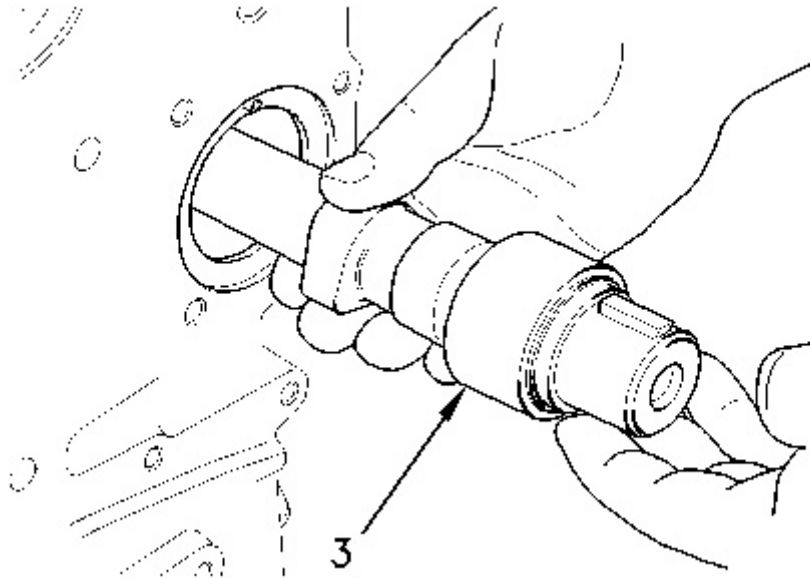


Illustration 1

g00951934

NOTICE

Do not damage the lobes or the bearings when the camshaft is removed or installed.

2. Carefully remove camshaft (3) from the cylinder block.

Installation Procedure

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

Note: Ensure that the camshaft is clean. Lubricate the camshaft with clean engine oil prior to installation.

NOTICE

Do not damage the lobes or the bearings when the camshaft is removed or installed.

1. Carefully install camshaft (3) in the cylinder block.

End By:

- a. Install the front housing. Refer to Disassembly and Assembly, "Housing (Front) - Install".
 - b. Install the rocker shaft and the pushrods. Refer to Disassembly and Assembly, "Rocker Shaft and Pushrod - Install".
-

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i02299077

Camshaft Gear - Remove and Install

SMCS - 1210-010-GE

Removal Procedure

Table 1

Required Tools			
Tool	Part Number	Part Name	Qty
A	230-6284	Timing Pin (Camshaft)	1
B	230-6283	Timing Pin (Crankshaft)	1

Start By:

- Remove the fan. Refer to Disassembly and Assembly, "Fan - Remove and Install".
- Remove the front cover. Refer to Disassembly and Assembly, "Front Cover - Remove and Install".
- Remove the idler gear. Refer to Disassembly and Assembly, "Idler Gear - Remove and Install".

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

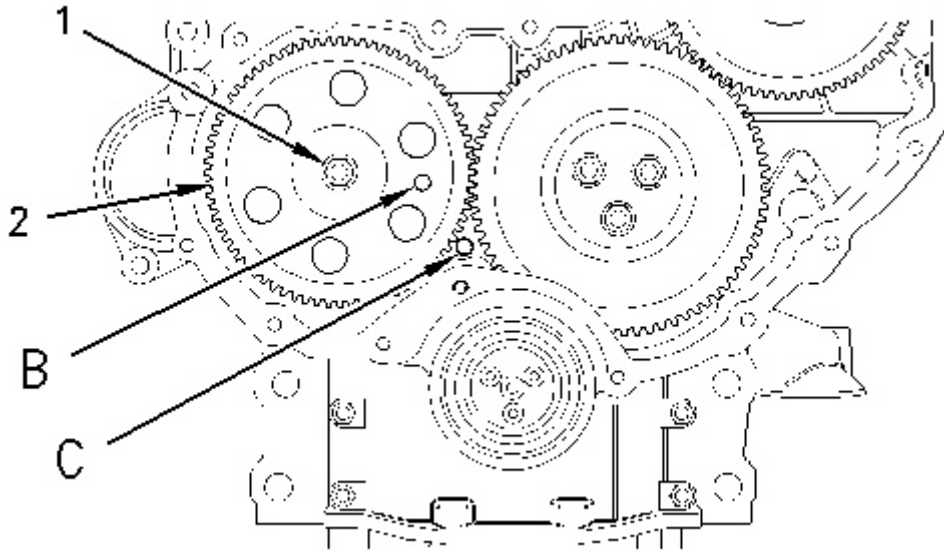


Illustration 1

g01001848

1. Remove the setscrew (1) and the washer from the camshaft gear (2).
2. Remove the camshaft gear from the camshaft.

Note: Do not lose the key from the camshaft gear.

Installation Procedure

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

1. Make sure that the No. 1 cylinder is at the top center compression stroke. Refer to Testing and Adjusting, "Finding Top Center Position for No. 1 Piston".
 2. Inspect the camshaft gear and the key for wear or damage.
 3. Install the Tooling (A) through the camshaft gear. Install the Tooling (B) into the crankshaft web.
-

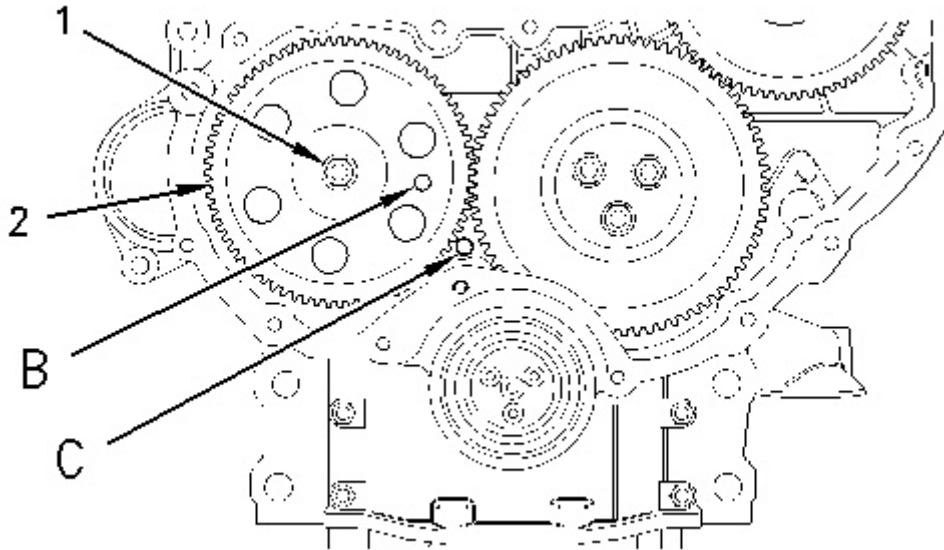


Illustration 2

g01001848

4. Install the camshaft gear (2) on the camshaft.

Note: Ensure that the key is installed on the camshaft. When you install the camshaft gear, ensure that the marked teeth are facing toward the front. If necessary, tap the gear with a soft hammer in order to seat the key in the keyway. Make sure that the Tooling (A) goes into the hole in the front housing.

5. Install the setscrew (1) and the washer on the camshaft gear (2). Tighten the setscrew to a torque of 95 N·m (70 lb ft).
6. Remove the Tooling (A) from the camshaft gear. Remove the Tooling (B) from the crankshaft web.

End By:

- a. Install the idler gear. Refer to Disassembly and Assembly, "Idler Gear - Remove and Install".
- b. Install the front cover. Refer to Disassembly and Assembly, "Front Cover - Remove and Install".
- c. Install the fan. Refer to Disassembly and Assembly, "Fan - Remove and Install".

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i02299758

Camshaft Bearings - Remove and Install

SMCS - 1211-010

Removal Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	8S-2241	Camshaft Bearing Tool Group	1
	8H-0684	Ratchet Wrench	1

Start By:

- Remove the camshaft. Refer to Disassembly and Assembly, "Camshaft - Remove and Install".

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

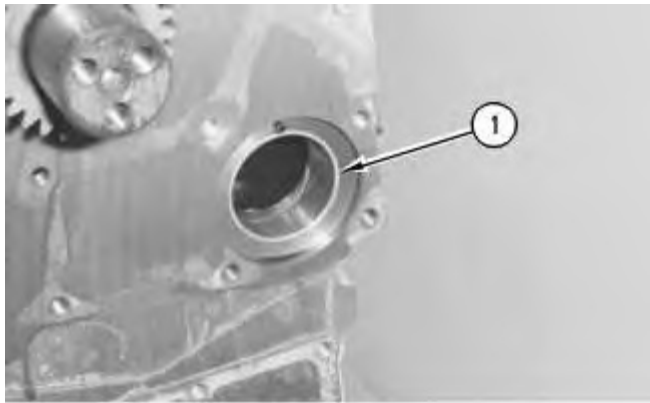


Illustration 1

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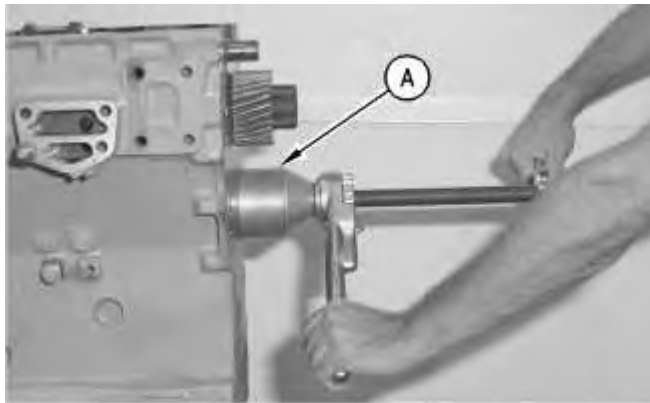


Illustration 2

g00546238

1. Use the Tooling (A) in order to remove the camshaft bearing (1) from the cylinder block.

Installation Procedure

Table 2

Required Tools			
Tool	Part Number	Part Description	Qty
A	8S-2241	Camshaft Bearing Tool Group	1
	8H-0684	Ratchet Wrench	1

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

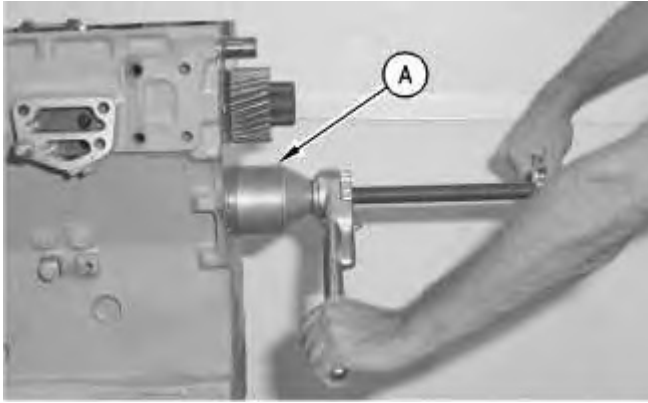


Illustration 3

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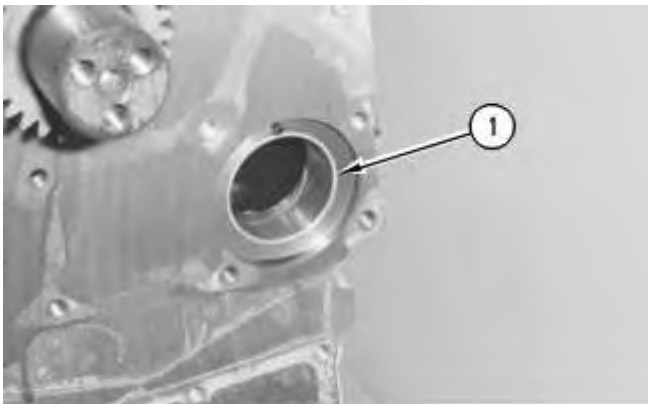


Illustration 4

g00546333

1. Use the Tooling (A) in order to install the camshaft bearing (1) into the bore in the cylinder block.

Note: Align the oil hole in camshaft bearing (1) with the oil hole in the bore in the cylinder block.

Note: The camshaft bearing must be inserted until the front edge of the bearing is flush with the face of the recess in the cylinder block.

End By:

- a. Install the camshaft. Refer to Disassembly and Assembly, "Camshaft - Remove and Install".
-

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i05003149

Engine Oil Pan - Remove and Install

SMCS - 1302-010

Removal Procedure

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting, and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, "Dealer Service Tool Catalog" for tools and supplies suitable to collect and contain fluids on Cat products.

Dispose of all fluids according to local regulations and mandates.

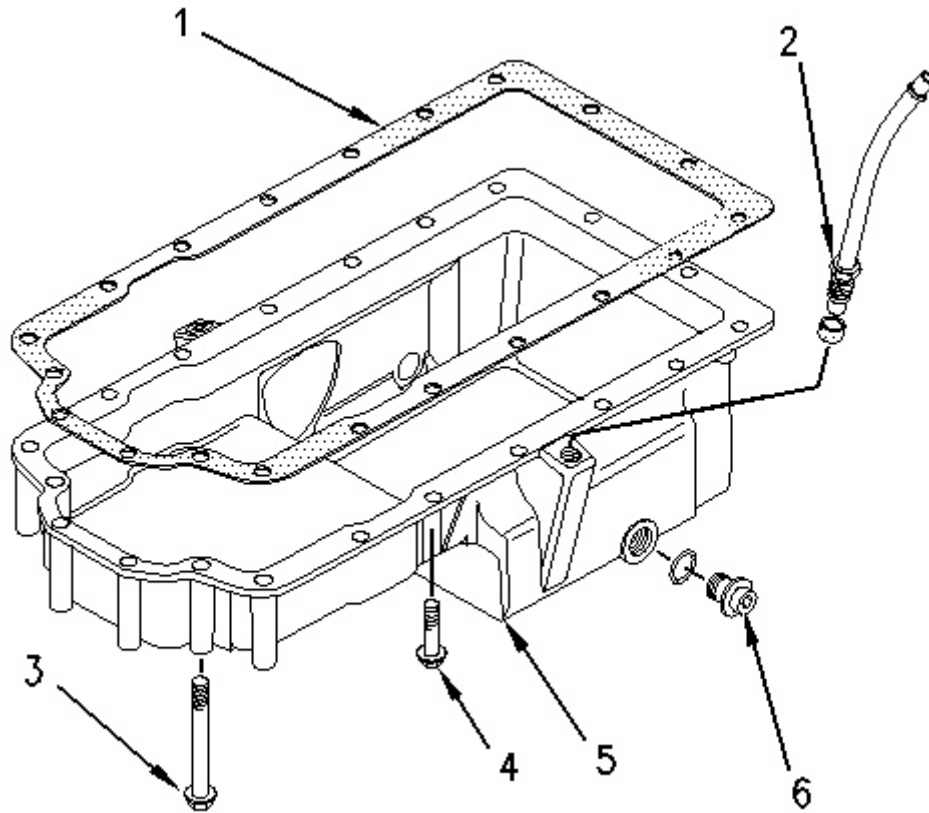


Illustration 1

g00956531

1. Remove all dirt, oil, and grease from the exterior surfaces of the oil pan (5).
2. Operate the engine until the engine is warm. Stop the engine.
3. Remove the oil drain plug (6) and the O-ring seal. Drain the engine oil into a suitable container for storage or disposal.

Note: Refer to the Operation and Maintenance Manual, "Refill Capacities" for information on the capacity of the lubrication system.

Note: Ensure that the engine oil pan is fully supported before the oil pan is removed. Particular care must be taken with the cast iron version of the engine oil sump as this version is heavy.

4. Remove the setscrews (3) and the setscrews (4) from the engine oil pan (5).
5. Remove the engine oil pan (5) and remove the gasket (1) from the cylinder block. Discard the gasket (1).
6. If necessary, remove the nut (2), the seal, and the tube assembly from the engine oil pan.
7. Clean the engine oil pan (5) with a suitable cleaning fluid. Ensure that all of the cleaning fluid is removed.

Installation Procedure

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	-	Guide Bolt (M8 x 1.25 x 70 mm)	4
B	-	Loctite 5900	-
C	-	Loctite 243	-

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

1. Clean the flange face of the engine oil pan (5) and the flange face of the cylinder block.
-

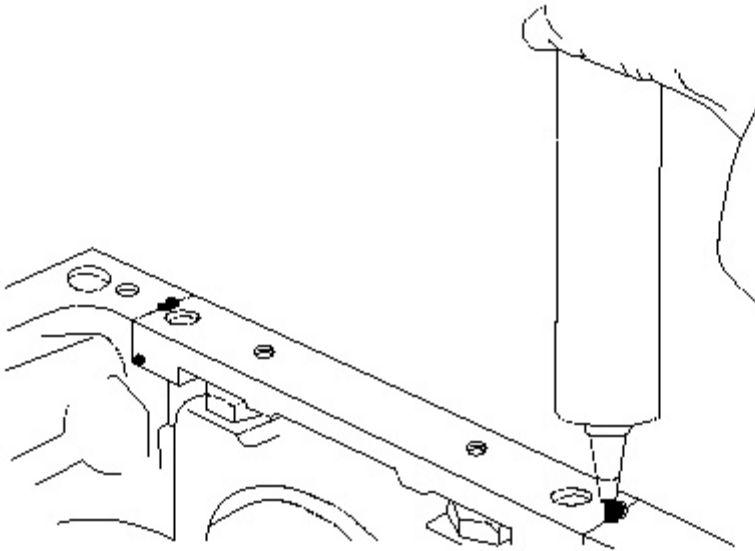


Illustration 2

g00541498

2. When the gasket for the oil pan is removed, damage may occur to the existing seal in the groove of the bridge. If the seal is damaged, apply a sufficient amount of Tooling (B) in order to fill the groove. The groove must be completely filled.
 3. Apply Tooling (B) to the joint between the cylinder block and the front housing.
-

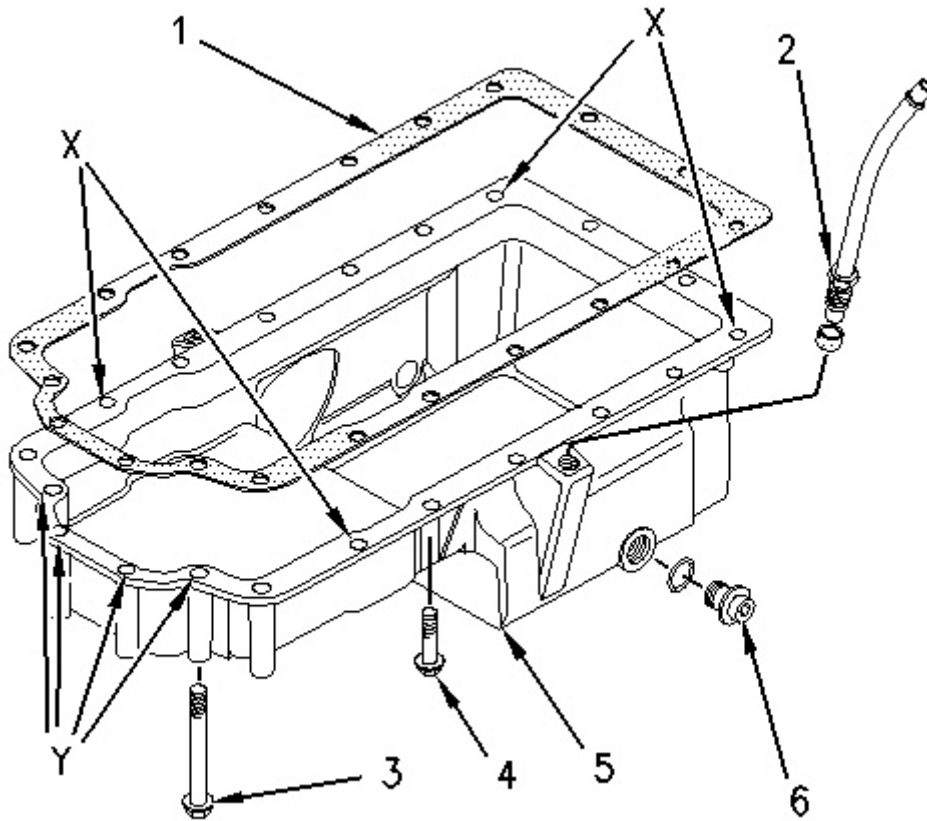


Illustration 3

g00956479

4. Install Tooling (A) in the cylinder block in Hole (X).
Note: New setscrews have sealant on the first 13 mm (0.5 inch) of the threads. In order to reuse the old setscrews, clean the old sealant from the bolts and apply Tooling (C) to the setscrews.
Note: Ensure that the engine oil pan is properly supported while the engine oil pan (5) is installed onto the cylinder block.
5. Position a new gasket (1) and the engine oil pan (5) on the cylinder block. Install the setscrews (3 and 4) in order to secure the engine oil pan to the cylinder block. Tighten the setscrews finger tight.
6. Remove the Tooling (A) and install the remaining setscrews (3 and 4). Tighten the setscrews (3) in Hole (Y) to a torque of 22 N·m (16 lb ft).
7. Tighten the remaining setscrews (3 and 4) to a torque of 22 N·m (16 lb ft).
8. Inspect the O-ring for the drain plug (6). Replace the O-ring if it is necessary. Install the O-ring seal and drain plug (6). Tighten the drain plug to a torque of 34 N·m (25 lb ft).
9. If necessary, install the seal and the tube assembly in the engine oil pan. Tighten the nut (2) to a torque of 18 N·m (13 lb ft).
10. Fill the engine oil pan to the correct level that is indicated on the engine oil level gauge.

Note: Refer to the Operation and Maintenance Manual, "Refill Capacities" for the lubrication system capacity of the engine.

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i02300831

Piston Cooling Jets - Remove and Install

SMCS - 1331-010

Removal Procedure

Start By:

- a. Remove the engine oil pan. Refer to Disassembly and Assembly, "Engine Oil Pan - Remove and Install".

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

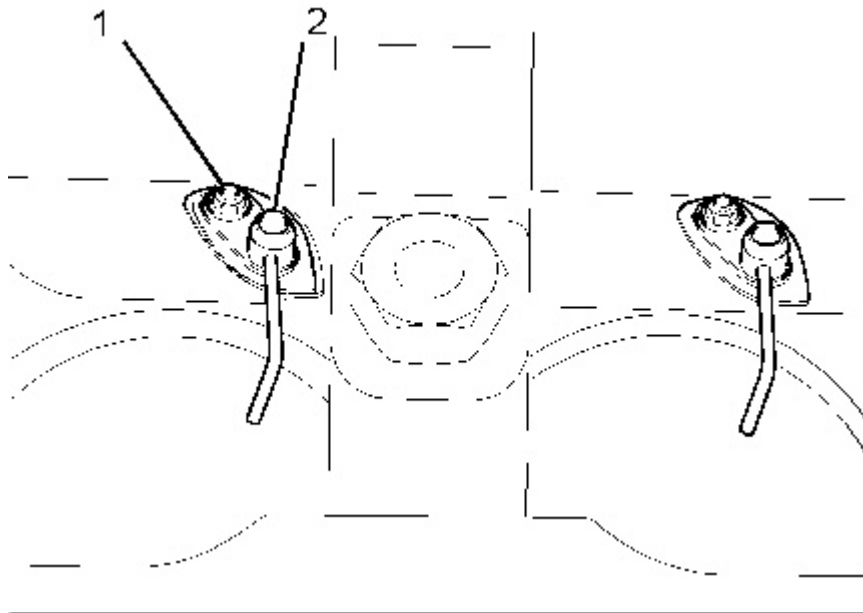


Illustration 1

g01152129

1. Remove the setscrew (1). Remove the piston cooling jet assembly (2) from the cylinder block.

Note: The engine crankshaft may be rotated in order to access all of the piston cooling jet assemblies.

Note: Ensure that the ball moves freely within the valve assembly of the piston cooling jet. Check that the tube of the piston cooling jet assembly is not damaged.

Installation Procedure

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

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