

Product: LOCOMOTIVE ENGINE
Model: 3512C LOCOMOTIVE ENGINE NJT
Configuration: 3512C Locomotive Engine NJT00001-UP

Disassembly and Assembly 3512C Locomotive Engine

Media Number -KENR8129-04

Publication Date -01/09/2018

Date Updated -14/09/2018

i02282781

Engine Oil Pan - Disassemble

SMCS - 1302-015

Disassembly Procedure

Start By:

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

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

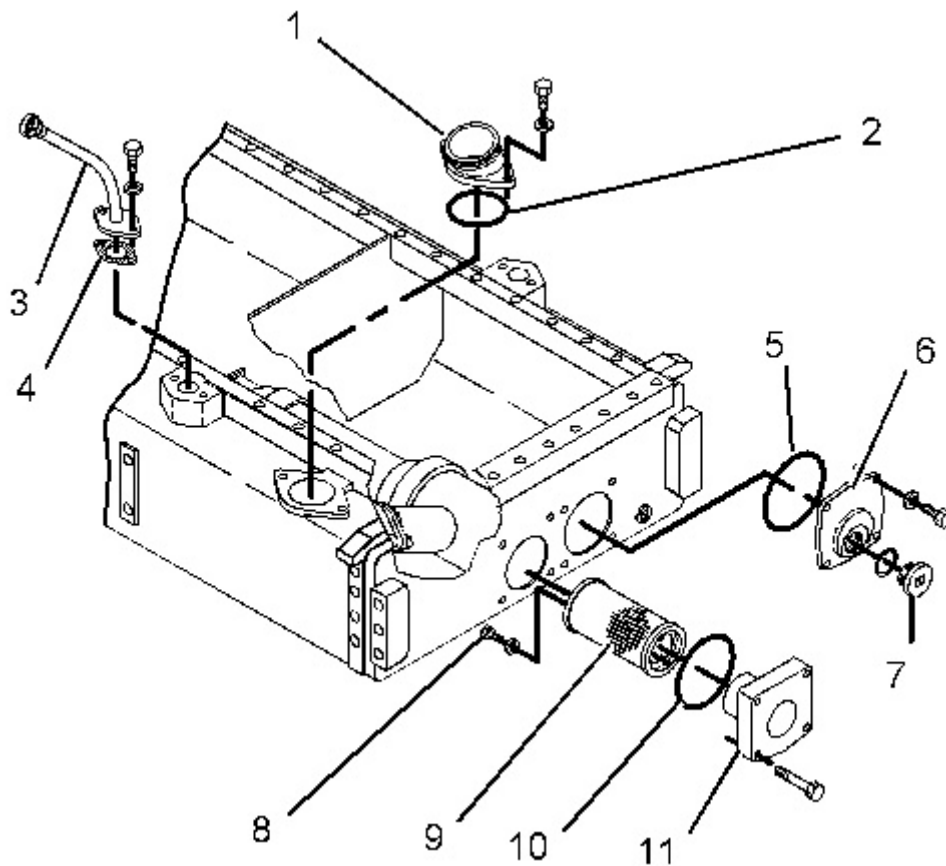


Illustration 1

g01142529

1. Remove drain plug (7). Remove the O-ring seal from the drain plug.
 2. Remove connector (1) and O-ring seal (2).
 3. Remove engine oil level gauge (3) and gasket (4).
 4. Remove cover (6) and O-ring seal (5).
 5. Remove adapter (11) and O-ring seal (10).
 6. Remove bolts (8). Remove suction screen assembly (9) from adapter (11).
-

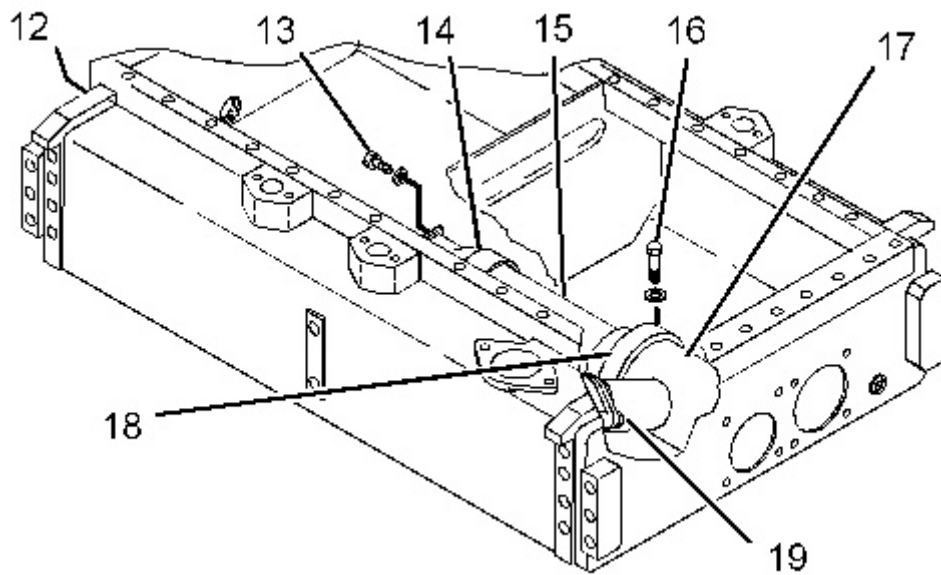


Illustration 2

g01142583

7. Remove bolts (13) and clamp (14). Remove suction tube (15). Remove the O-ring seal from the suction tube.
 8. Remove bolts (16). Remove oil housing (18) from tube assembly (17).
 9. Remove bolts (19). Remove tube assembly (17) from the engine oil pan. Remove the O-ring seals from the tube assembly.
 10. Remove drain plug (12). Remove the O-ring seal from the drain plug.
-

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i02282777

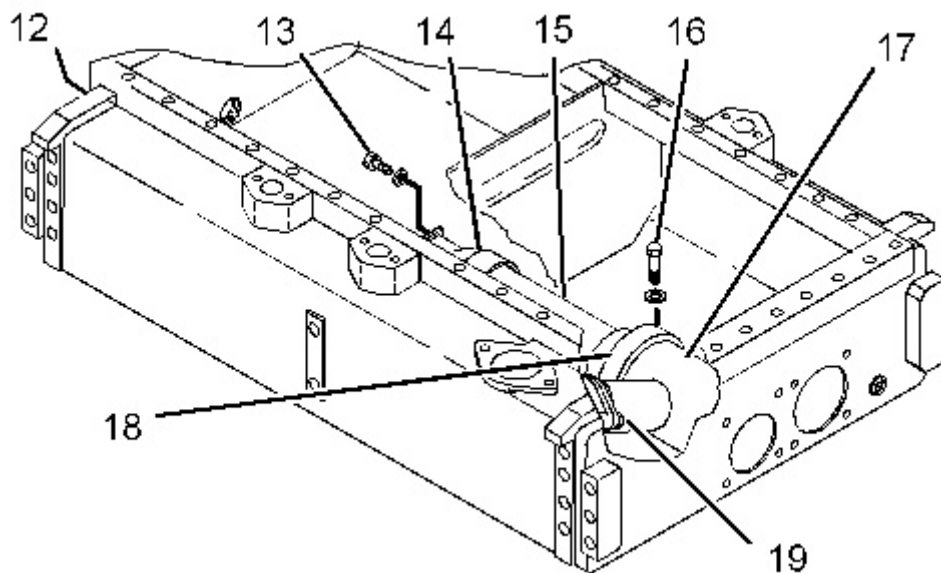
Engine Oil Pan - Assemble

SMCS - 1302-016

Assembly Procedure

Table 1

| Required Tools | | | |
|----------------|-------------|---------------------|-----|
| Tool | Part Number | Part Description | Qty |
| A | 1P-0808 | Multipurpose Grease | - |



1. Install the O-ring seals on tube assembly (17). Apply Tooling (A) to the O-ring seals. Position tube assembly in the engine oil pan. Install bolts (19) and tighten to a torque of $47 \pm 9 \text{ N}\cdot\text{m}$ ($35 \pm 7 \text{ lb ft}$).
 2. Install oil housing (18) on tube assembly (17). Install bolts (16) and tighten to a torque of $47 \pm 9 \text{ N}\cdot\text{m}$ ($35 \pm 7 \text{ lb ft}$).
 3. Install the O-ring seal on suction tube (15). Apply Tooling (A) to the O-ring seal. Install suction tube (15) into oil housing (18). Install clamp (14) and bolts (13).
 4. Install the O-ring seal on drain plug (12). Install drain plug (12) and tighten to a torque of $145 \pm 15 \text{ N}\cdot\text{m}$ ($107 \pm 11 \text{ lb ft}$).
-

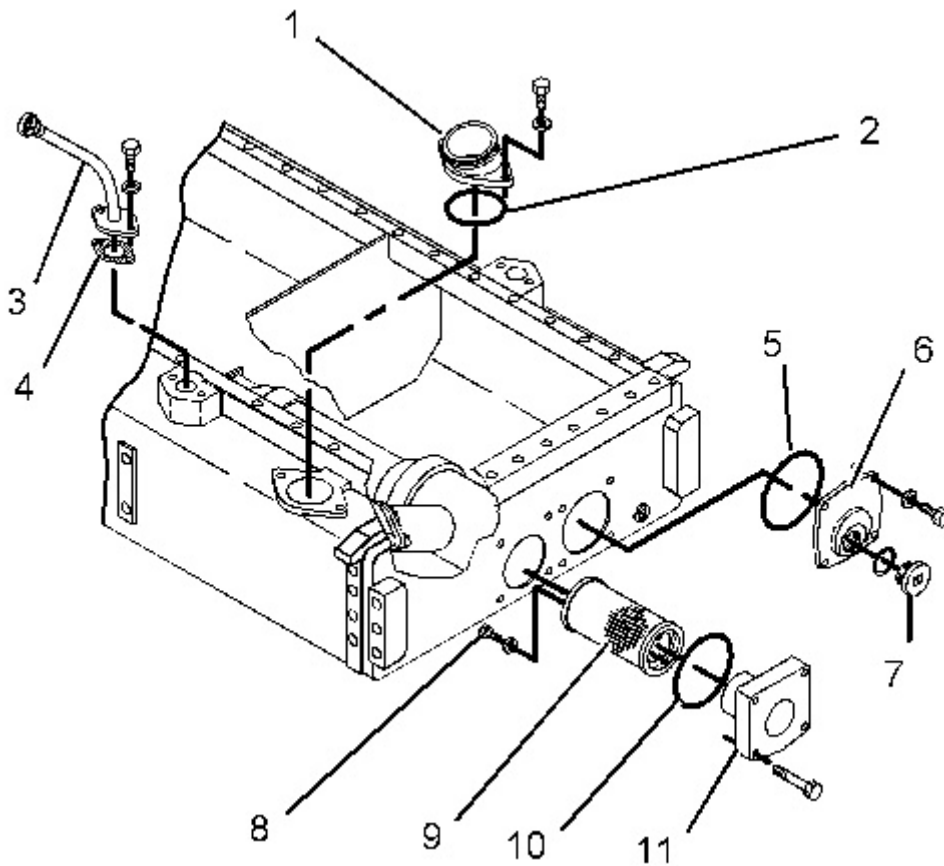


Illustration 2

g01142529

5. Install suction screen assembly (9) on adapter (11). Install bolts (8).
6. Install O-ring seal (10) and adapter (11) on the engine oil pan.
7. Install O-ring seal (5) and cover (6) on the engine oil pan.
8. Install gasket (4) and engine oil level gauge (3).
9. Install O-ring seal (2) and connector (1).
10. Install the O-ring seal on drain plug (7). Install drain plug (7) and tighten to a torque of $145 \pm 15 \text{ N}\cdot\text{m}$ ($107 \pm 11 \text{ lb ft}$).

End By:

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

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i04999779

Engine Oil Pan - Install

SMCS - 1302-012

Installation Procedure

Table 1

| Required Tools | | | |
|----------------|-------------|----------------------------------|-----|
| Tool | Part Number | Part Description | Qty |
| A | - | Loctite 595 | - |
| B | 1P-0808 | Multipurpose Grease | - |
| C | - | Guide Stud 3/8 - 16 by 5 inch | 4 |

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

1. Clean the sealing surfaces of the engine oil pan and the cylinder block.
-

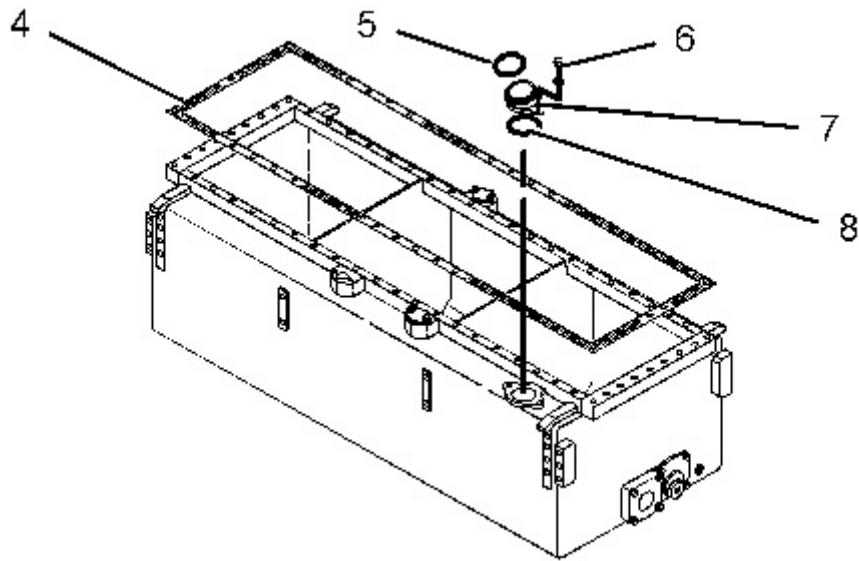


Illustration 1

g01123600

2. Apply Tooling (A) to oil pan gasket (4) . Install the oil pan gasket on the engine oil pan. Install Tooling (C) in the engine oil pan.
3. Apply Tooling (B) to the bore of flange (7) . Install seal (8) inside flange (7) . Position the flange and install bolts (6) . Install O-ring seal (5) on the flange.

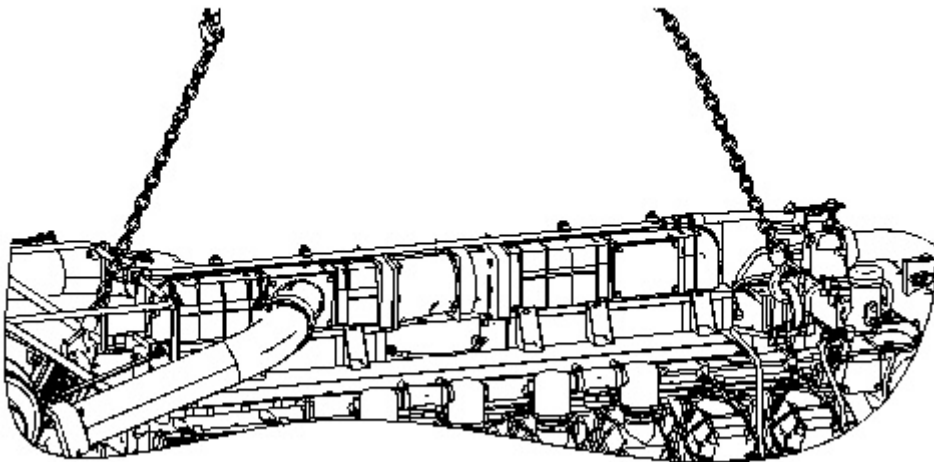


Illustration 2

g01123599

 **WARNING**

Improper lift rigging can allow unit to tumble causing injury and damage.

4. Attach a suitable lifting device to the engine lifting eyes.
 - The weight of the 3508C Engine is approximately 4535 kg (10000 lb). The weight of the engine oil pan is approximately 240 kg (530 lb).
 - The weight of the 3512C Engine is approximately 6800 kg (15000 lb). The weight of the engine oil pan is approximately 295 kg (650 lb).
 - The weight of the 3516C Engine is approximately 9100 kg (20000 lb). The weight of the engine oil pan is approximately 409 kg (900 lb).
5. Lift the engine. Place the engine onto the engine oil pan.

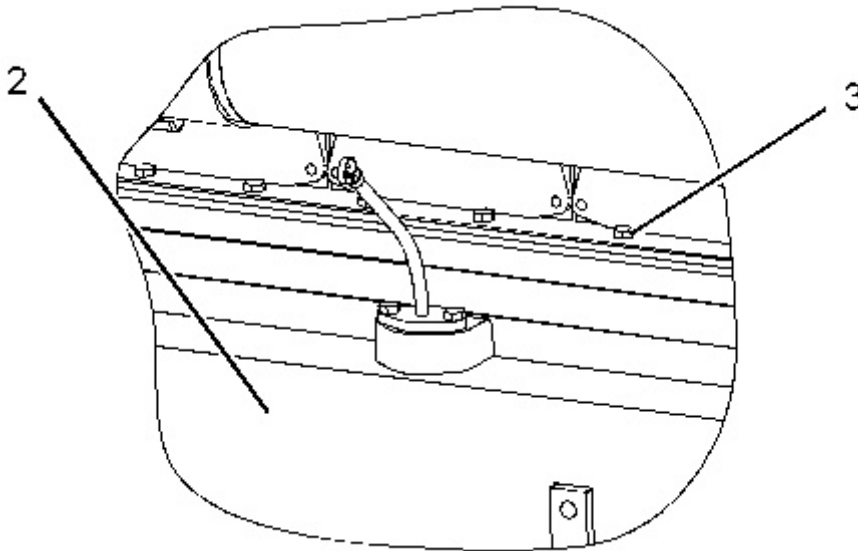


Illustration 3

g01123597

6. Install bolts (3) . Remove Tooling (C) from engine oil pan (2) and install remaining bolts (3) .
-

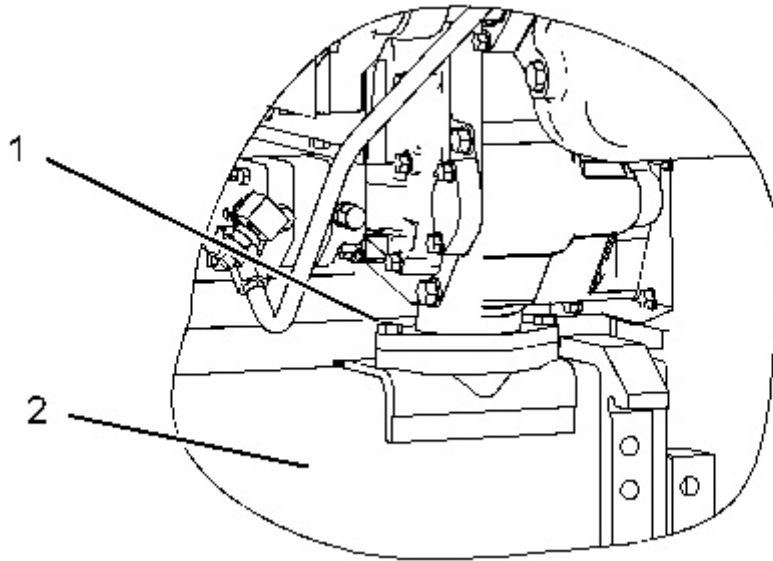


Illustration 4

g01123595

7. Install bolts (1) that hold the connector for the engine oil pump to engine oil pan (2) .
 8. Fill the engine oil pan to the correct level that is indicated on the engine oil level gauge. Refer to Operation and Maintenance Manual, "Engine Oil and Filter - Change".
-

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i01932610

Crankcase Breather - Remove and Install

SMCS - 1317-010

Removal Procedure

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

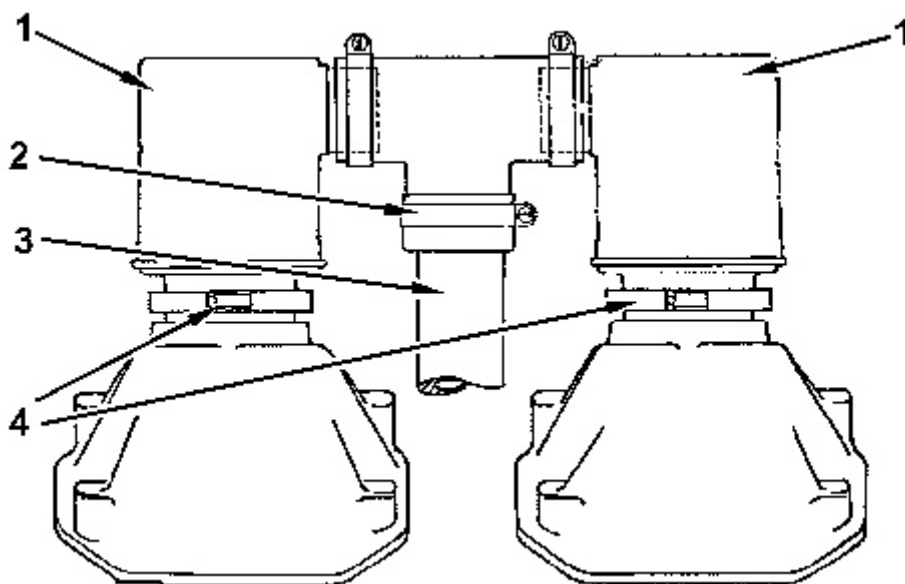


Illustration 1

g01057823

1. Loosen clamp (2). Remove the clamp and tube (3).
2. Loosen clamps (4). Remove both breathers (1) as a unit.

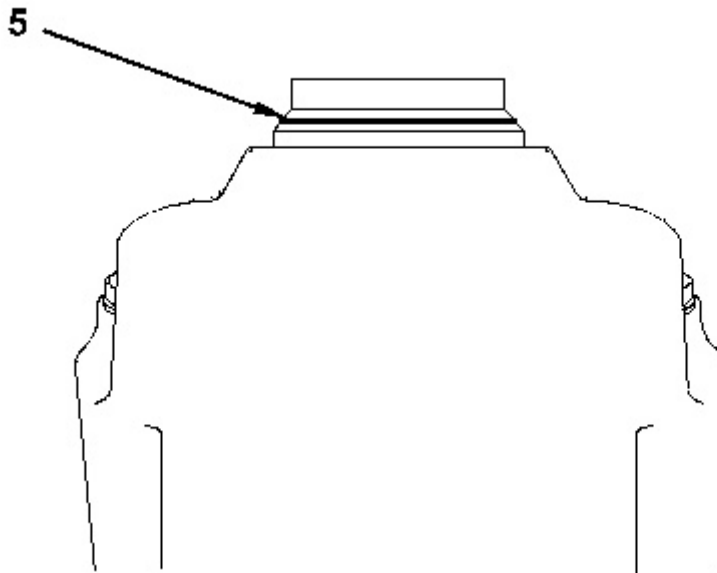


Illustration 2

g01057824

3. Remove O-ring seals (5) from the valve covers. Discard the O-ring seals.

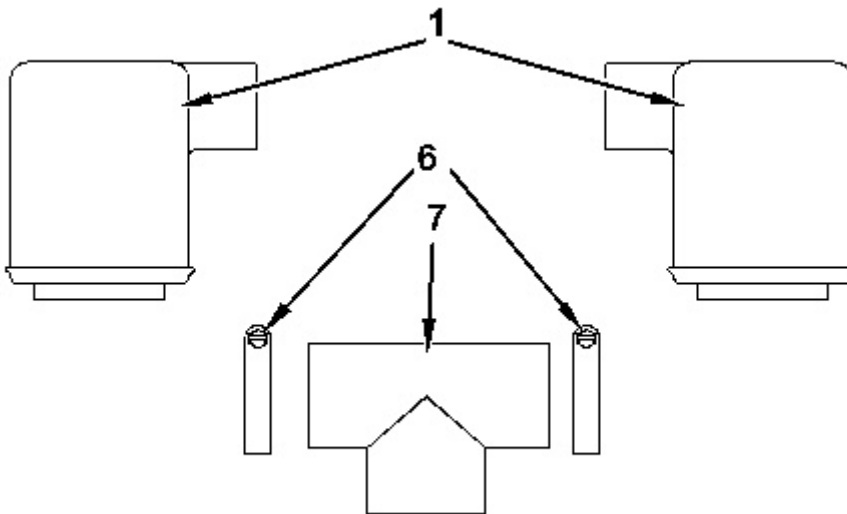


Illustration 3

g01057825

4. Remove clamps (6). Remove both breathers (1) from tee assembly (7).

Inspect the tee assembly for cracks. If the tee assembly is cracked, discard the old tee assembly and obtain a new tee assembly for installation.

5. Turn the breathers upside-down in order to inspect the condition of the breather elements.

Clean the breather elements with clean, nonflammable solvent. If the breather elements remain contaminated after the cleaning, discard the breathers and obtain new breathers. Do not attempt to disassemble the breathers.

Allow the breather elements to dry before installation.

Installation Procedure

NOTICE

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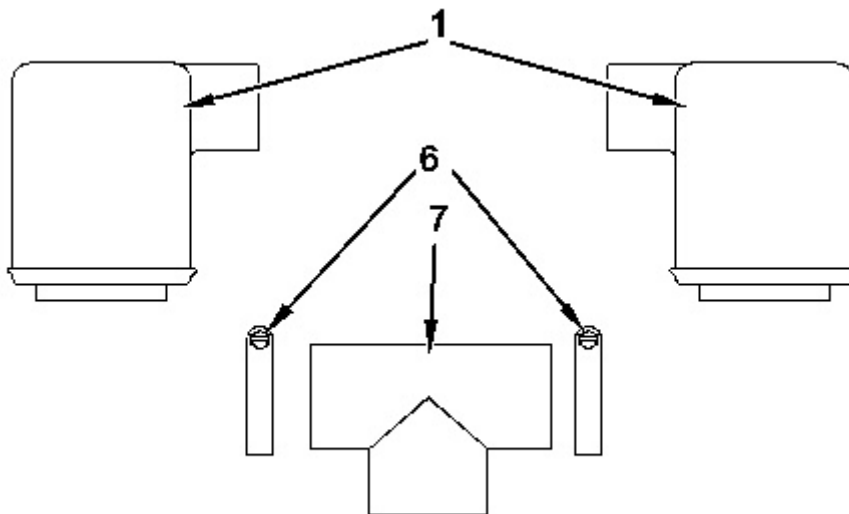


Illustration 4

g01057825

Note: Coat the rubber parts with clean engine oil or petroleum jelly in order to make installation easier.

1. Place clamps (6) over the parts of tee assembly (7) that will receive breathers (1). Install breathers (1) into the tee assembly. Tighten the clamps to a torque of 3.0 ± 0.5 N·m (27 ± 4 lb in).
-

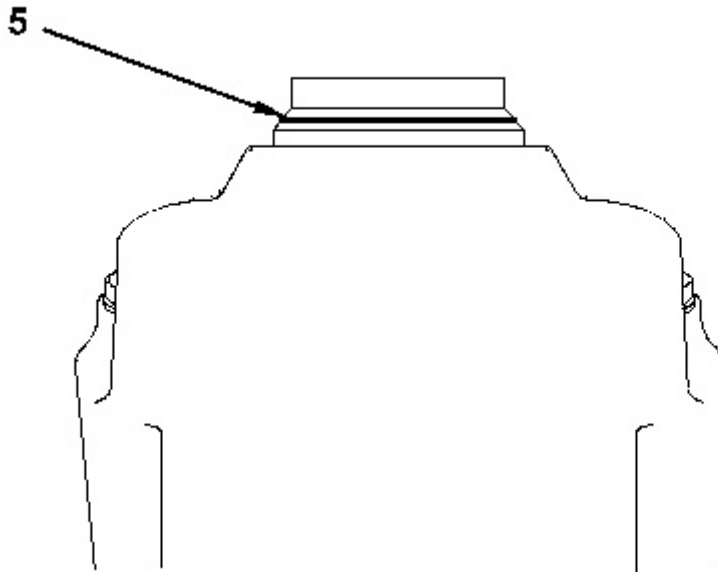


Illustration 5

g01057824

2. Coat new O-ring seals (5) with clean engine oil. Place the O-ring seals on the valve covers.

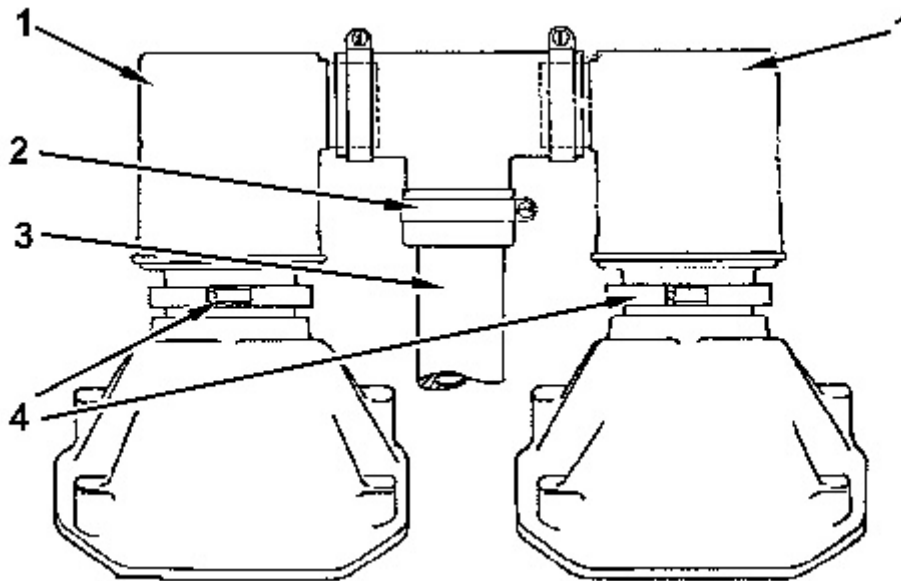


Illustration 6

g01057823

3. Place clamps (4) around the parts of the breathers that will be attached to the valve covers. Install both breathers (1) as a unit. Tighten the clamps.
4. Place clamp (2) on the part of the tee assembly that will receive tube (3). Install the tube. Tighten the clamp to a torque of $3.0 \pm 0.5 \text{ N}\cdot\text{m}$ ($27 \pm 4 \text{ lb in}$).

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i02706053

Valve Mechanism Cover - Remove and Install

SMCS - 1107-010

Removal Procedure

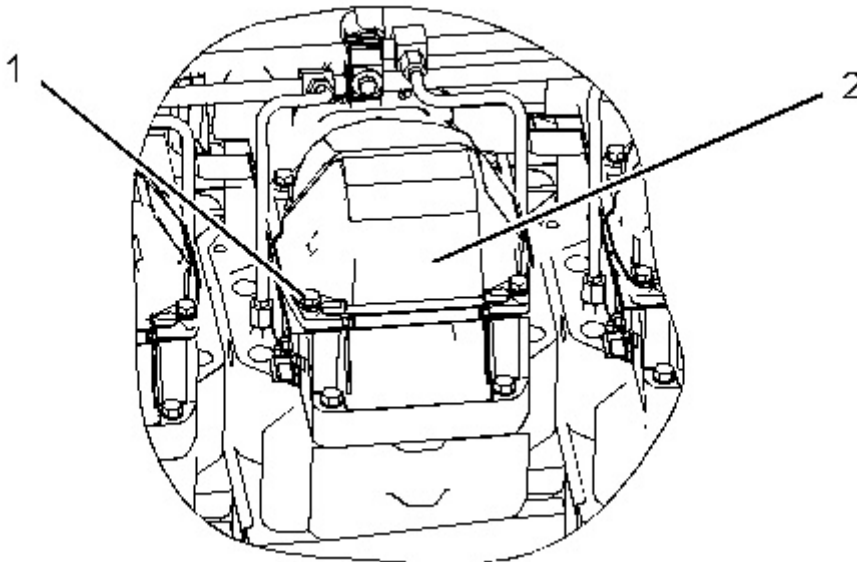


Illustration 1

g01119199

1. Remove bolts (1). Remove valve mechanism cover (2).
2. Remove the seal from the valve mechanism cover.

Installation Procedure

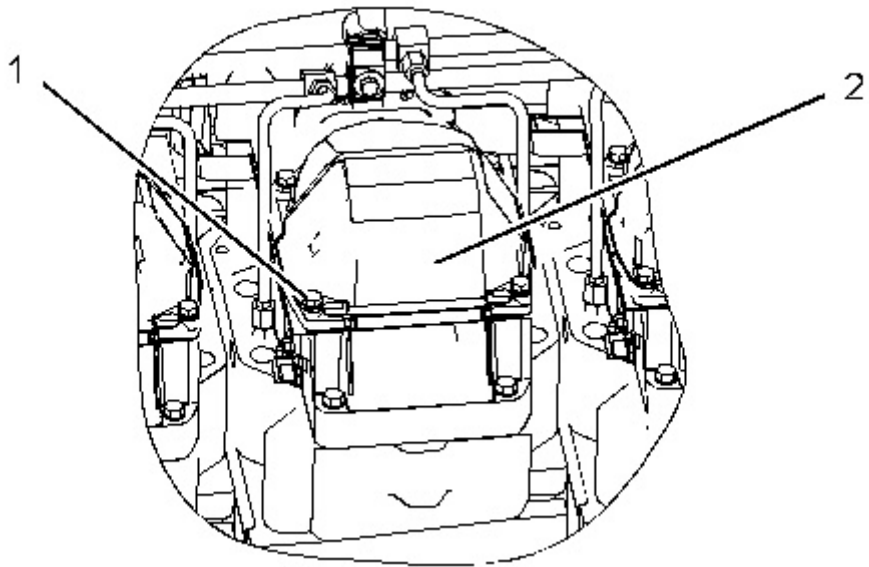


Illustration 2

g01119199

1. Install the seal on the valve mechanism cover.
 2. Install valve mechanism cover (2). Install bolts (1).
-

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i06703315

Valve Mechanism Cover Base - Remove and Install

SMCS - 1120-010

Removal Procedure

Start By:

- a. Remove the electronic unit injectors. Refer to Disassembly and Assembly, "Electronic Unit Injector - Remove".

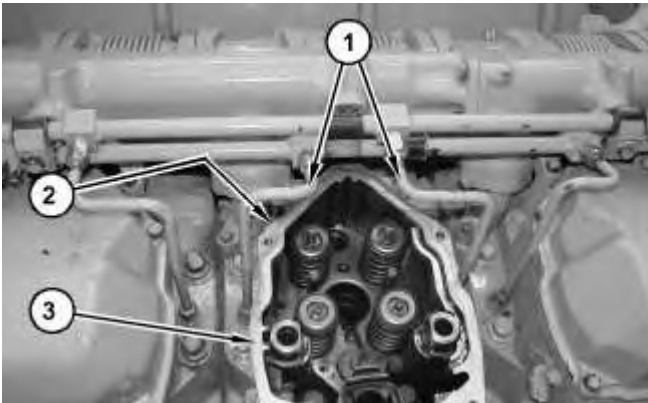


Illustration 1

g01052887

1. Remove tube assemblies (1).
2. Remove bolts (2) (not shown) and valve mechanism cover base (3).

Installation Procedure

Table 1

| |
|-----------------------|
| Required Tools |
|-----------------------|

| Tool | Part Number | Part Description | Qty |
|------|-------------|------------------|-----|
| A | | Loctite 243 | - |

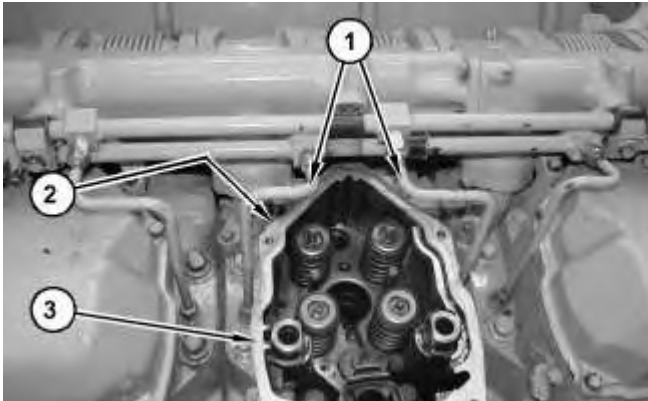


Illustration 2

g01052887

1. Position valve mechanism cover base (3). Apply Tooling (A) to the threads of bolts (2) (not shown) and install bolts (2) (not shown).
2. Install tube assemblies (1).

End By:

- a. Install the electronic unit injectors. Refer to Disassembly and Assembly, "Electronic Unit Injector - Install".
-

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i02315452

Rocker Shaft and Pushrod - Remove

SMCS - 1102-011; 1208-011

Removal Procedure

Start By:

- a. Remove the valve mechanism cover. Refer to Disassembly and Assembly, "Valve Mechanism Cover - Remove and Install".

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

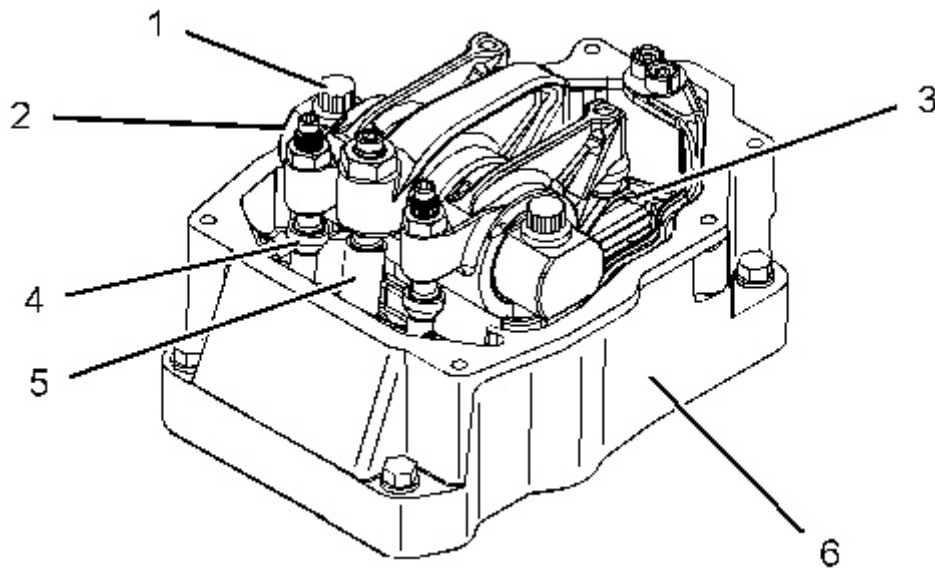


Illustration 1

g01119693

1. Remove bolts (1). Remove rocker shaft assembly (2) from valve mechanism cover base (6). Remove valve pushrods (4).

Note: Mark the valve pushrods for identification of location for assembly.

2. Remove bridge assemblies (3) from the valve stems.

Note: Mark the bridge assemblies with identification of location for assembly.

3. To remove pushrod (5), it is necessary to remove valve mechanism cover base (6).
-

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i02315619

Rocker Shaft - Disassemble

SMCS - 1102-015

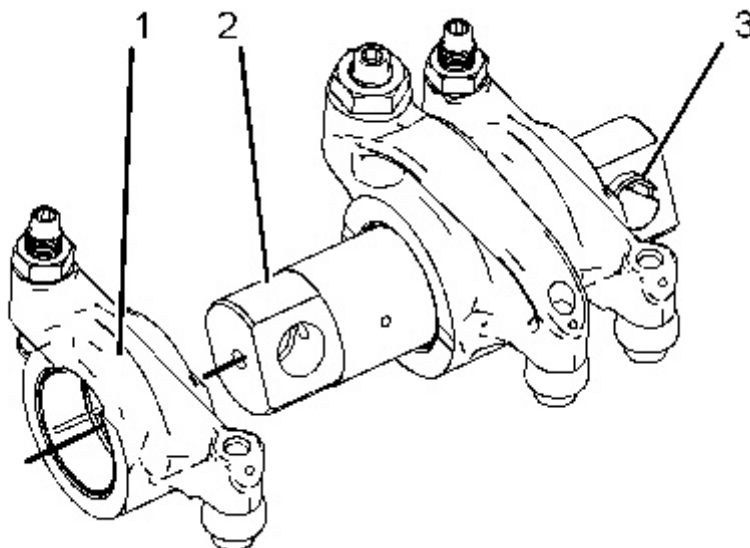
Disassembly Procedure

Table 1

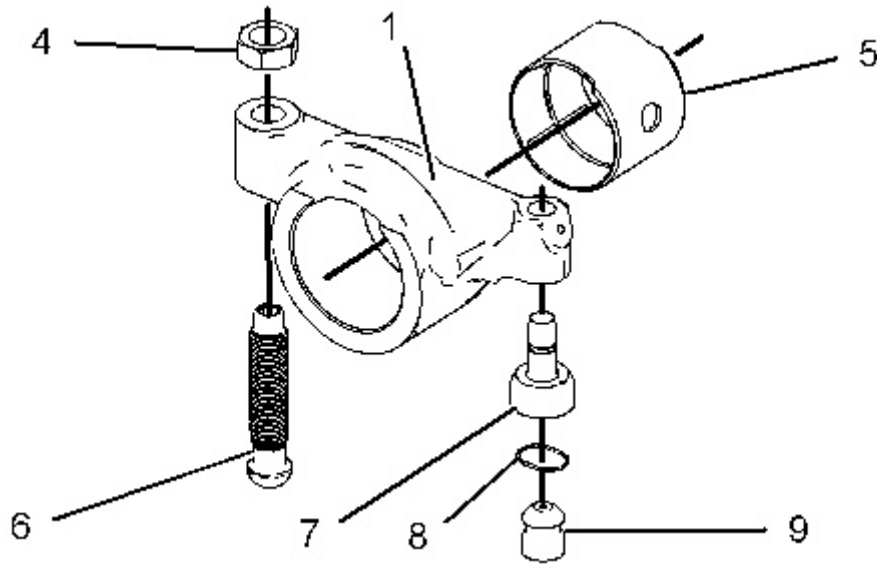
| Required Tools | | | |
|----------------|-------------|------------------|-----|
| Tool | Part Number | Part Description | Qty |
| A | 1P-0510 | Driver Group | 1 |

Start By:

- a. Remove the rocker shaft assembly. Refer to Disassembly and Assembly, "Rocker Shaft and Pushrod - Remove".



1. Slide shaft (2) out of rocker arm (1). If necessary, remove spring pin (3) from the shaft.



2. Remove jam nut (4) from adjustment screw (6). Remove the adjustment screw from rocker arm (1).
3. Remove button (9) from socket (7). Remove retaining ring (8) from button (9).
4. Use a hammer and a punch to remove socket (7) from rocker arm (1).
5. Use Tooling (A) to remove sleeve bearing (5) from the rocker arm.

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i02706144

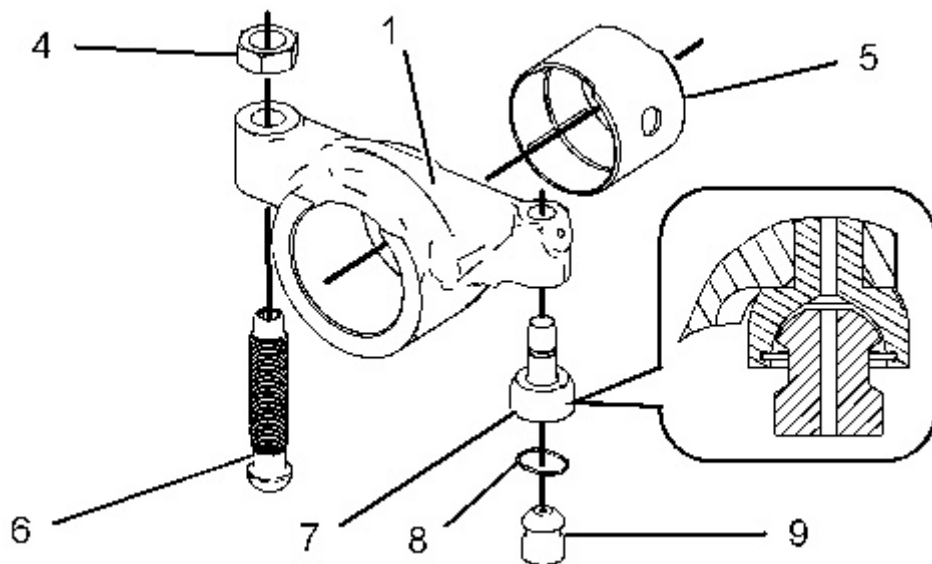
Rocker Shaft - Assemble

SMCS - 1102-016

Assembly Procedure

Table 1

| Required Tools | | | |
|----------------|-------------|------------------|-----|
| Tool | Part Number | Part Description | Qty |
| A | 1P-0510 | Driver Group | 1 |



1. The sleeve bearing and the rocker arm have oil supply holes. The holes must be aligned when the sleeve bearing is installed in the rocker arm. Align the joint of the sleeve bearing toward the top of the rocker arm. Align the oil hole in the sleeve bearing with the oil hole in the rocker arm. Use Tooling (A) to install sleeve bearing (5) in rocker arm (1).
2. Align the scribe mark on socket (7) with the center line of rocker arm (1). Press socket (7) fully into rocker arm (1).
3. Place retaining ring (8) on button (9). Install button (9) in socket (7).
4. Install adjustment screw (6) in rocker arm (1). Install jam nut (4) on the adjustment screw.

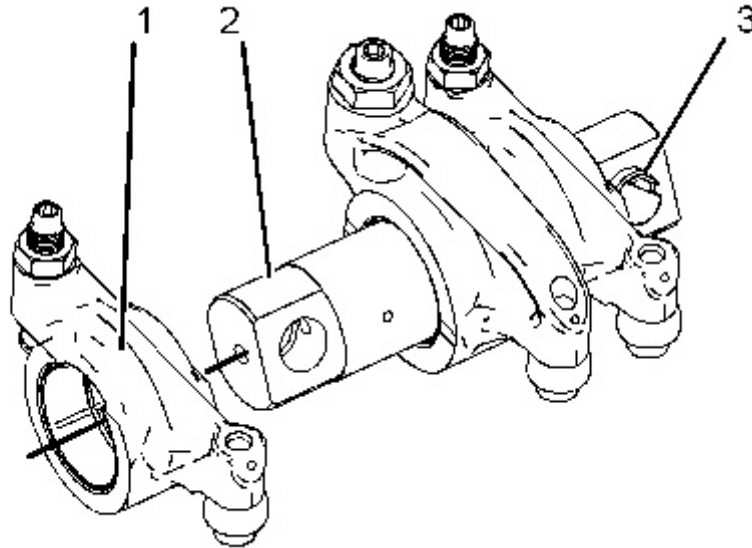


Illustration 2

g01120055

5. If spring pin (3) was removed from shaft (2), install a new spring pin. Position the split in spring pin (3) toward the end of shaft (2) and press the spring pin into the shaft.
6. Apply clean engine oil to the sleeve bearing of rocker arm (1) and to shaft (2). Install the rocker arm on the shaft.

End By:

- a. Install the rocker shaft assembly. Refer to Disassembly and Assembly, "Rocker Shaft and Pushrod - Install".
-

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