

Product: VIBRATORY COMPACTOR

Model: CS-44 VIBRATORY COMPACTOR M4C

Configuration: CS44 CP44 Vibratory Soil Compactor M4C00001-UP (MACHINE) POWERED BY C4.4 Engine

Disassembly and Assembly

C4.4 Engines for Caterpillar Built Machines

Media Number -KENR6082-19

Publication Date -01/10/2013

Date Updated -21/10/2013

i03500271

Idler Gear - Remove

SMCS - 1206-011

Removal Procedure (Early Heavy-Duty Idler Gear)

Table 1

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

Start By:

- If the engine is equipped with an air compressor, remove the air compressor. Refer to Disassembly and Assembly, "Air Compressor - Remove and Install".
- If the engine is equipped with a vacuum pump, remove the vacuum pump. Refer to Disassembly and Assembly, "Vacuum Pump - Remove and Install".
- If the engine is equipped with an accessory drive, remove the accessory drive. Refer to Disassembly and Assembly, "Accessory Drive - Remove and Install".
- Remove the fuel injection pump gear. Refer to Disassembly and Assembly, "Fuel Pump Gear - Remove".
- Remove the valve mechanism cover. Refer to Disassembly and Assembly, "Valve Mechanism Cover - Remove and Install".

Note: Care must be taken in order to ensure that the fuel injection pump timing is not lost during the removal of the fuel pump gear. Carefully follow the procedure in order to remove the fuel pump gear.

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

Note: The assembly of heavy-duty idler gear is not serviceable. Do not disassemble the heavy-duty idler gear.

1. Ensure that number one piston is at the top center position on the compression stroke. Refer to the Systems Operation, Testing and Adjusting, "Finding Top Center Position for No. 1 Piston".
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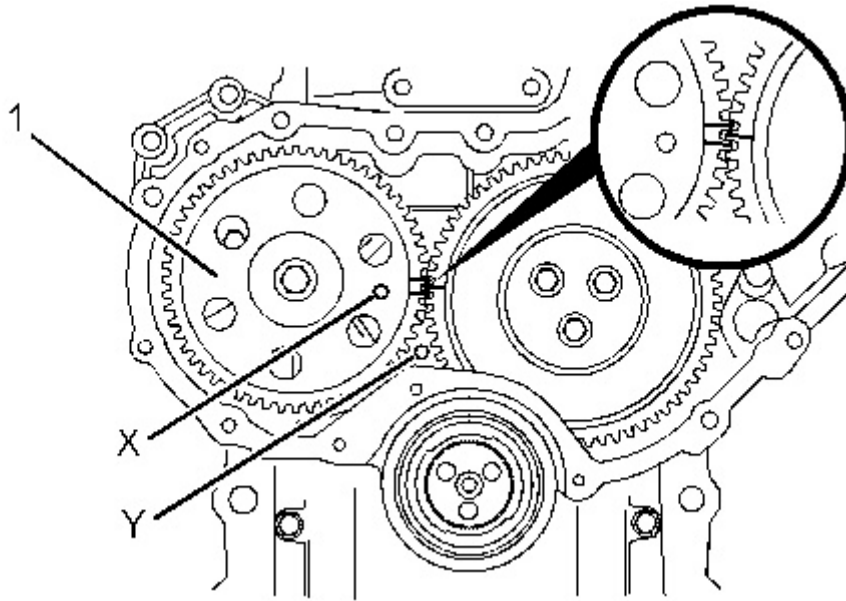


Illustration 1

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Alignment of timing marks

2. Ensure that Tooling (A) is installed into Hole (X) in camshaft gear (1). Use Tooling (A) in order to lock the camshaft in the correct position.

Note: Ensure that the gears are marked in order to show alignment.

3. Ensure that Tooling (B) is installed in Hole (Y) in the front housing. Use Tooling (B) in order to lock the crankshaft in the correct position.
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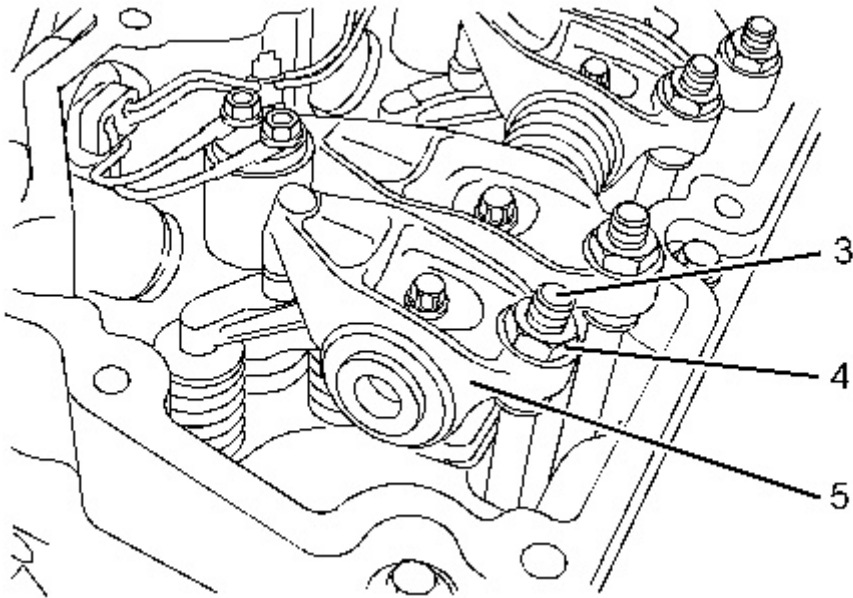


Illustration 2
Typical example

g01473493

4. Loosen nuts (4) on all rocker arms (5). Unscrew adjusters (3) on all rocker arms (5) until all valves are fully closed.

Note: Failure to ensure that ALL adjusters are fully unscrewed can result in contact between the valves and pistons.

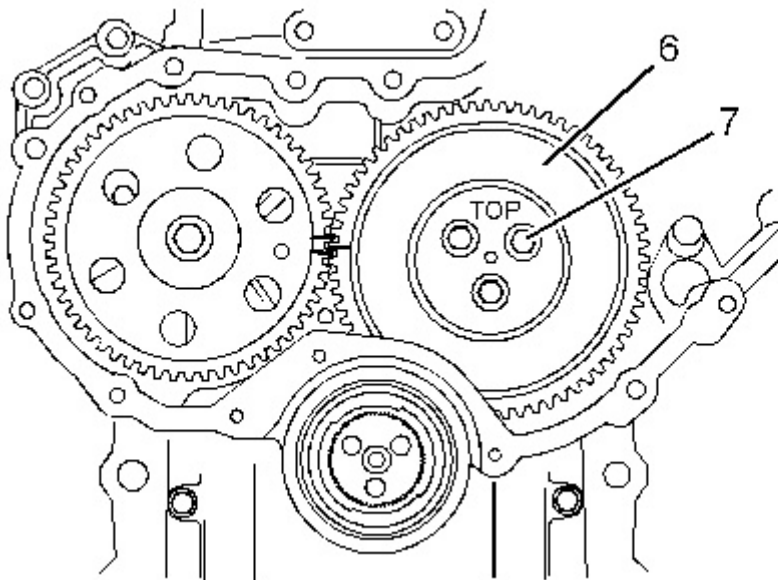


Illustration 3
Typical example

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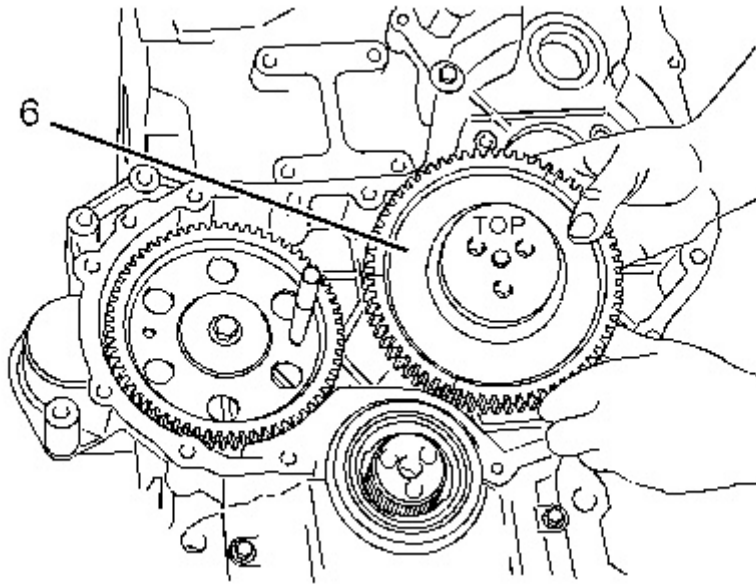


Illustration 4
Typical example

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5. Remove bolts (7) from the assembly of heavy-duty idler gear (6).
6. Remove the assembly of idler gear (6) from the recess in the front housing.

Note: The idler gear must be tilted during removal.

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Disassembly and Assembly C4.4 Engines for Caterpillar Built Machines

Media Number -KENR6082-19

Publication Date -01/10/2013

Date Updated -21/10/2013

i03500266

Idler Gear - Remove

SMCS - 1206-011

Removal Procedure (Standard Idler Gear)

Table 1

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

Start By:

- a. If the engine is equipped with an air compressor, remove the air compressor. Refer to Disassembly and Assembly, "Air Compressor - Remove and Install".
- b. If the engine is equipped with a vacuum pump, remove the vacuum pump. Refer to Disassembly and Assembly, "Vacuum Pump - Remove and Install".
- c. If the engine is equipped with an accessory drive, remove the accessory drive. Refer to Disassembly and Assembly, "Accessory Drive - Remove and Install".
- d. Remove the fuel injection pump gear. Refer to Disassembly and Assembly, "Fuel Pump Gear - Remove".
- e. Remove the valve mechanism cover. Refer to Disassembly and Assembly, "Valve Mechanism Cover - Remove and Install".

Note: Care must be taken in order to ensure that the fuel injection pump timing is not lost during the removal of the fuel pump gear. Carefully follow the procedure in order to remove the fuel pump gear.

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

1. Ensure that number one piston is at the top center position on the compression stroke. Refer to the Systems Operation, Testing and Adjusting, "Finding Top Center Position for No. 1 Piston".
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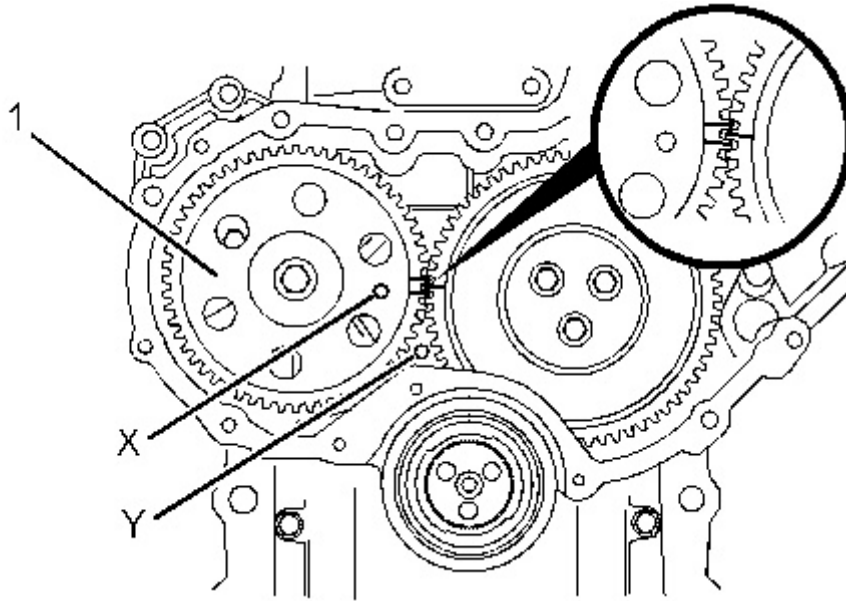


Illustration 1

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Alignment of timing marks

2. Ensure that Tooling (A) is installed into Hole (X) in camshaft gear (1). Use Tooling (A) in order to lock the camshaft in the correct position.

Note: Ensure that the gears are marked in order to show alignment.

3. Ensure that Tooling (B) is installed in Hole (Y) in the front housing. Use Tooling (B) in order to lock the crankshaft in the correct position.
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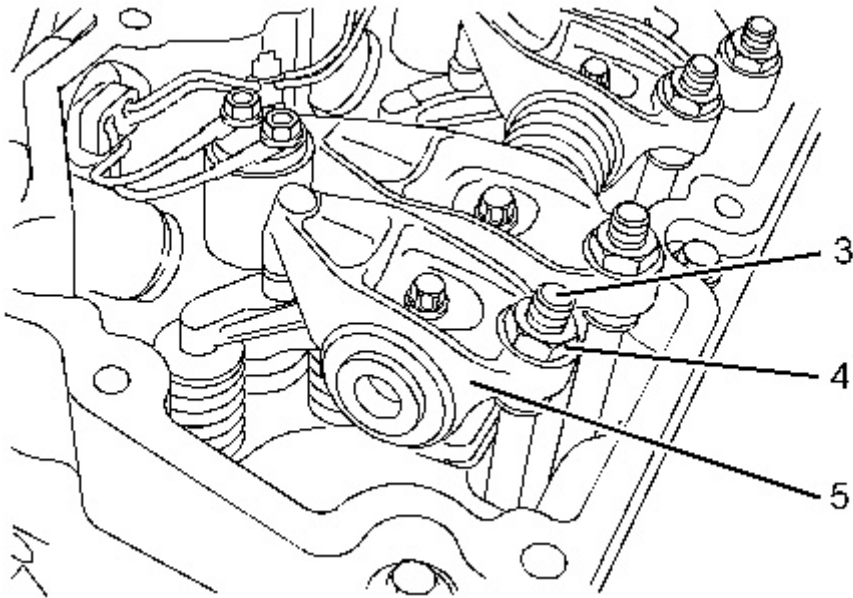


Illustration 2
Typical example

g01473493

4. Loosen nuts (4) on all rocker arms (5). Unscrew adjusters (3) on all rocker arms (5) until all valves are fully closed.

Note: Failure to ensure that ALL adjusters are fully unscrewed can result in contact between the valves and pistons.

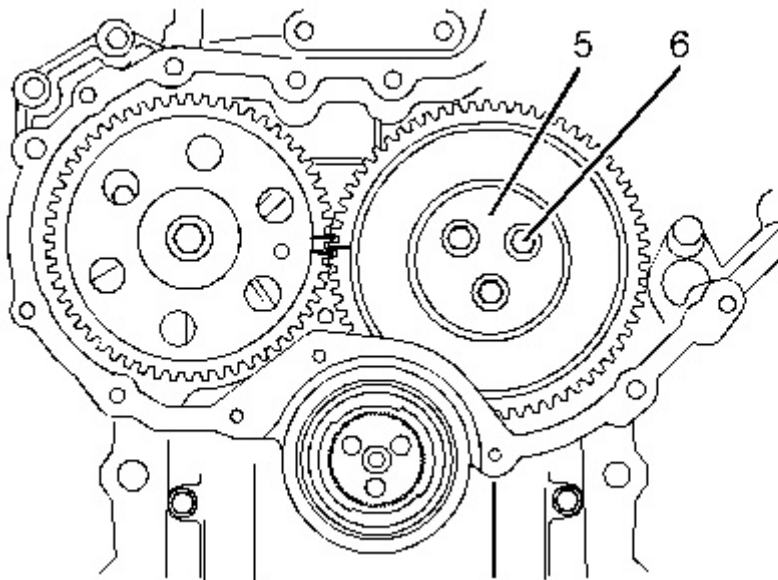


Illustration 3
Typical example

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5. Mark plate (5) in order to show orientation.

Note: Identification will ensure that the plate can be installed in the original orientation.

6. Remove bolts (6).

7. Remove plate (5).

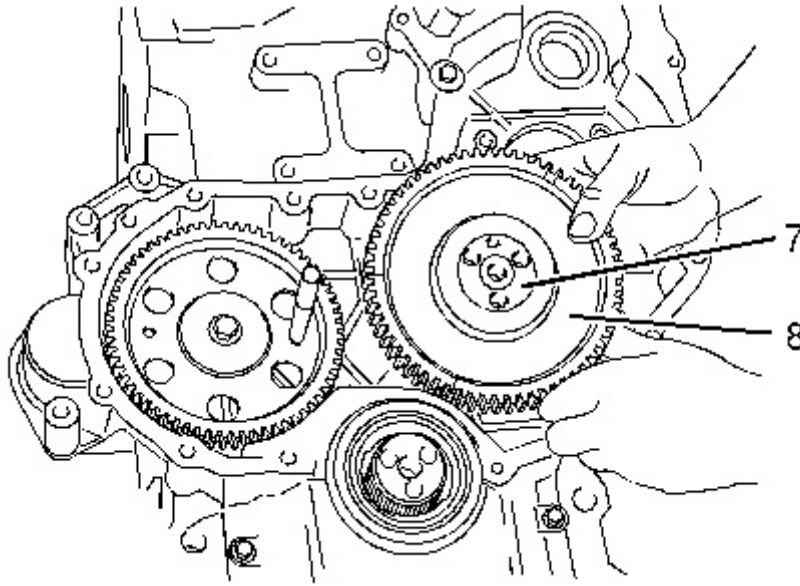


Illustration 4

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Typical example

8. Remove the assembly of idler gear (8) and hub (7) from the recess in the front housing.

Note: The idler gear must be tilted during removal.

9. Remove hub (7) from idler gear (8).

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Disassembly and Assembly C4.4 Engines for Caterpillar Built Machines

Media Number -KENR6082-19

Publication Date -01/10/2013

Date Updated -21/10/2013

i03500273

Idler Gear - Install

SMCS - 1206-012

Installation Procedure (Standard Idler Gear)

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	230-6284	Timing Pin (Camshaft)	1
B	230-6283	Timing Pin (Crankshaft)	1
C	9U-7324	Indicator Bracket	1
	7H-1942	Dial Indicator	1
	3S-3268	Indicator Contact Point	1
	7H-1940	Universal Attachment	1

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

1. Ensure that number one piston is at the top center position on the compression stroke. Refer to the Systems Operation, Testing and Adjusting, "Finding Top Center Position for No. 1 Piston".
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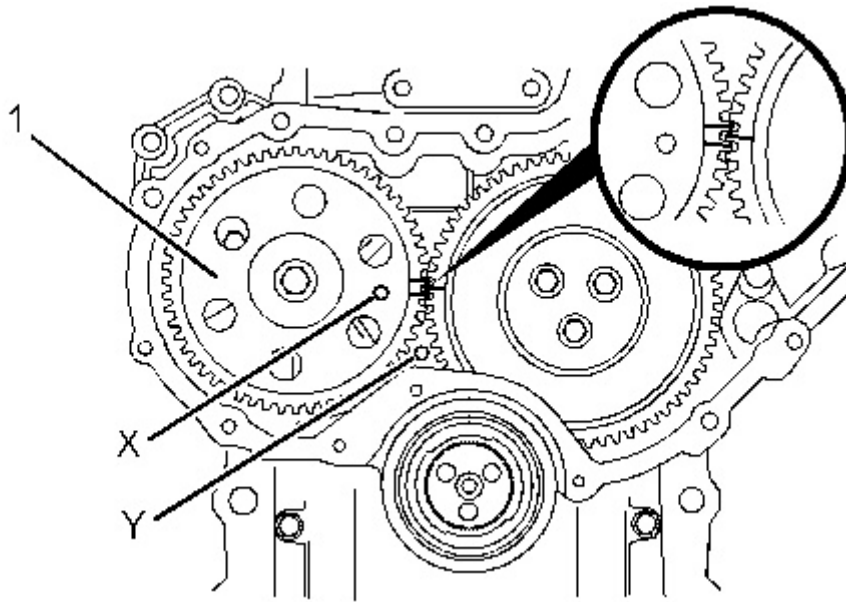


Illustration 1

g01473492

Alignment of timing marks

2. Ensure that Tooling (A) is installed into Hole (X) in camshaft gear (1).
3. Ensure that Tooling (B) is installed in Hole (Y) in the front housing. Use Tooling (B) in order to lock the crankshaft in the correct position.

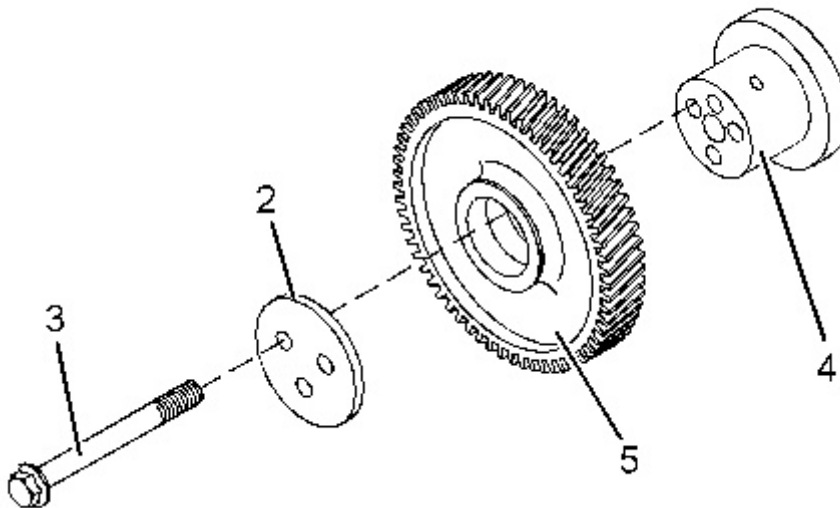


Illustration 2

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Typical example

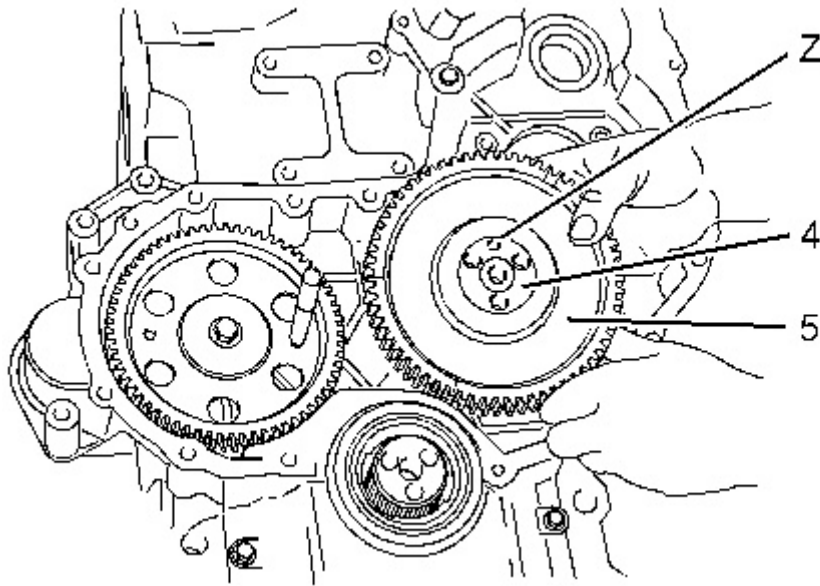


Illustration 3

g01473635

Typical example

4. Clean idler gear (5) and inspect the idler gear for wear or damage. Refer to Specifications, "Gear Group (Front)" for more information. If necessary, replace the idler gear.
 5. Clean hub (4) and inspect the hub for wear or damage. Refer to Specifications, "Gear Group (Front)" for more information. If necessary, replace the hub.
 6. Lubricate hub (4) with clean engine oil. Slide the hub into idler gear (5). Ensure that the timing marks are toward the front of the idler gear.
 7. Align the timing mark on idler gear (5) with the timing mark on the camshaft gear. Refer to the Illustration 1. Install the assembly of idler gear (5) and hub (4) into the recess in the timing case. Ensure that oil Hole (Z) is to the top of the hub.
- Note:** The idler gear must be tilted during installation. Ensure that the holes in the hub are aligned with the holes in the cylinder block.
8. Clean plate (2) and inspect the plate for wear or damage. If necessary, replace the plate.
 9. Lubricate plate (2) with clean engine oil. A used plate should be installed in the original orientation. If a new plate is installed, ensure that the holes in plate (2) are aligned with the holes in hub (4). Install plate (2) to hub (4).
 10. Install bolts (3). Tighten the bolts to a torque of 44 N·m (32 lb ft).
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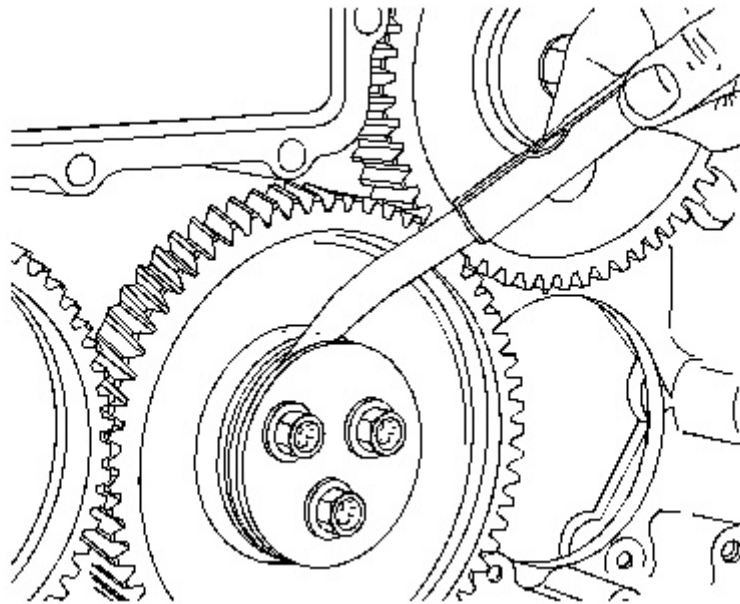


Illustration 4

g01269936

Checking end play by using a set of feeler gauge's

11. Use a set of feeler gauge's in order to check the end play for the idler gear. Refer to Specifications, "Gear Group (Front)" for more information.
12. Use Tooling (C) in order to check the backlash between the idler gear and the camshaft gear. Refer to Specifications, "Gear Group (Front)" for more information.
13. Use Tooling (C) in order to check the backlash between the idler gear and the crankshaft gear. Refer to Specifications, "Gear Group (Front)" for more information.
14. Lightly lubricate all of the gears with clean engine oil.

End By:

- a. Install the fuel injection pump gear. Refer to Disassembly and Assembly, "Fuel Pump Gear - Install".
 - b. If the engine is equipped with an air compressor, install the air compressor. Refer to Disassembly and Assembly, "Air Compressor - Remove and Install".
 - c. If the engine is equipped with a vacuum pump, install the vacuum pump. Refer to Disassembly and Assembly, "Vacuum Pump - Remove and Install".
 - d. If the engine is equipped with an accessory drive, install the accessory drive. Refer to Disassembly and Assembly, "Accessory Drive - Remove and Install".
-

Product: VIBRATORY COMPACTOR

Model: CS-44 VIBRATORY COMPACTOR M4C

Configuration: CS44 CP44 Vibratory Soil Compactor M4C00001-UP (MACHINE) POWERED BY C4.4 Engine

Disassembly and Assembly C4.4 Engines for Caterpillar Built Machines

Media Number -KENR6082-19

Publication Date -01/10/2013

Date Updated -21/10/2013

i03500280

Idler Gear - Install

SMCS - 1206-012

Installation Procedure (Early Heavy-Duty Idler Gear)

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	230-6284	Timing Pin (Camshaft)	1
B	230-6283	Timing Pin (Crankshaft)	1
C	9U-7324	Indicator Bracket	1
	7H-1942	Dial Indicator	1
	3S-3268	Indicator Contact Point	1
	7H-1940	Universal Attachment	1

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

1. Ensure that number one piston is at the top center position on the compression stroke. Refer to Systems Operation, Testing and Adjusting, "Finding Top Center Position for No. 1 Piston".
-

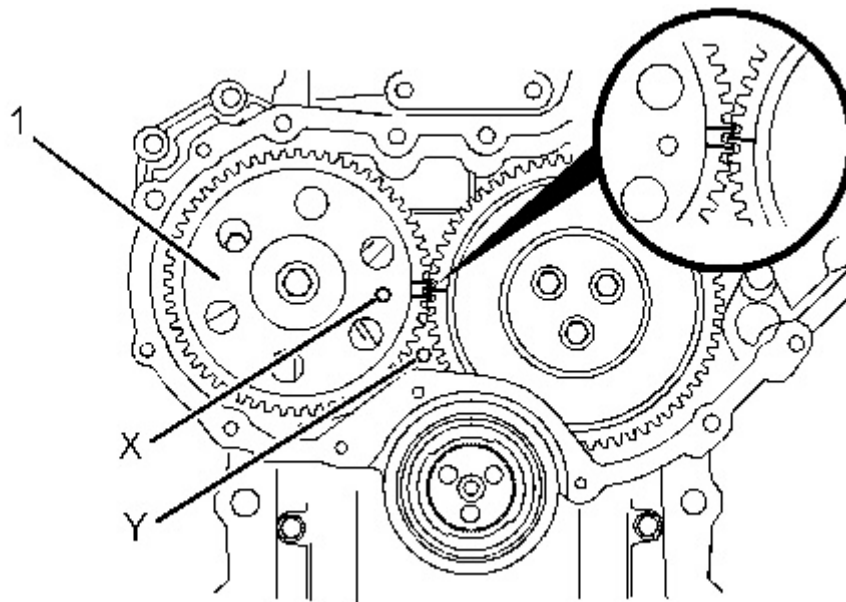


Illustration 1

g01473492

Alignment of timing marks

2. Ensure that Tooling (A) is installed into Hole (X) in camshaft gear (1).
3. Ensure that Tooling (B) is installed in Hole (Y) in the cylinder block. Use Tooling (B) in order to lock the crankshaft in the correct position.

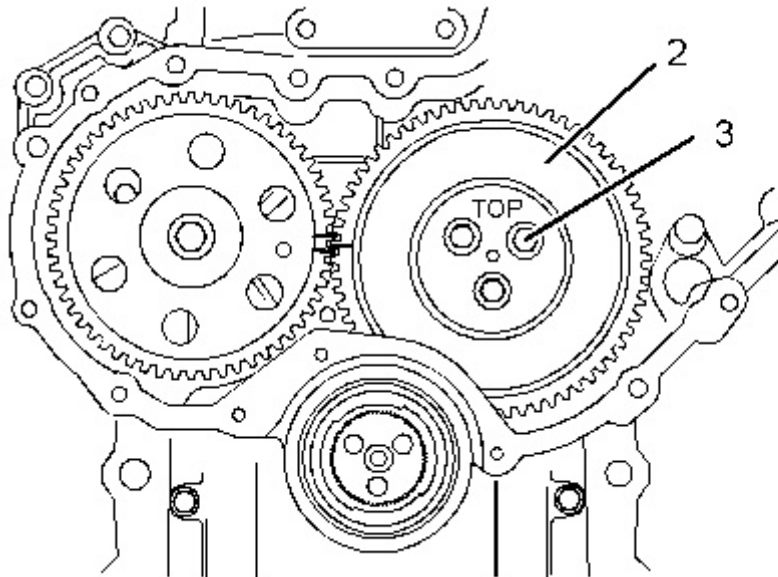


Illustration 2

g01473904

Typical example

4. Clean the assembly of idler gear (2) and inspect the assembly of the idler gear for wear or damage. Refer to Specifications, "Gear Group (Front)" for more information. If necessary, replace the assembly of the idler gear.
5. Lubricate the bearings in the assembly of idler gear (2) with clean engine oil.

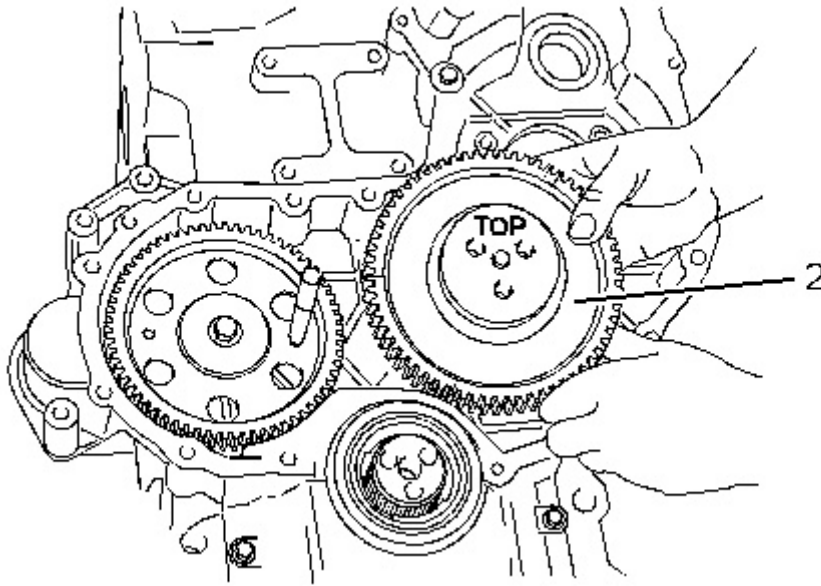


Illustration 3

g01473909

Typical example

6. Align the timing mark on idler gear (2) with the timing mark on the camshaft gear. Refer to Illustration 1. Install the assembly of idler gear (2) into the recess in the timing case. Ensure that the identification mark TOP is upward.

Note: The idler gear must be tilted during installation. Ensure that the holes in the assembly of the idler gear are aligned with the holes in the cylinder block.

7. Install bolts (3). Tighten the bolts to a torque of 44 N·m (32 lb ft).

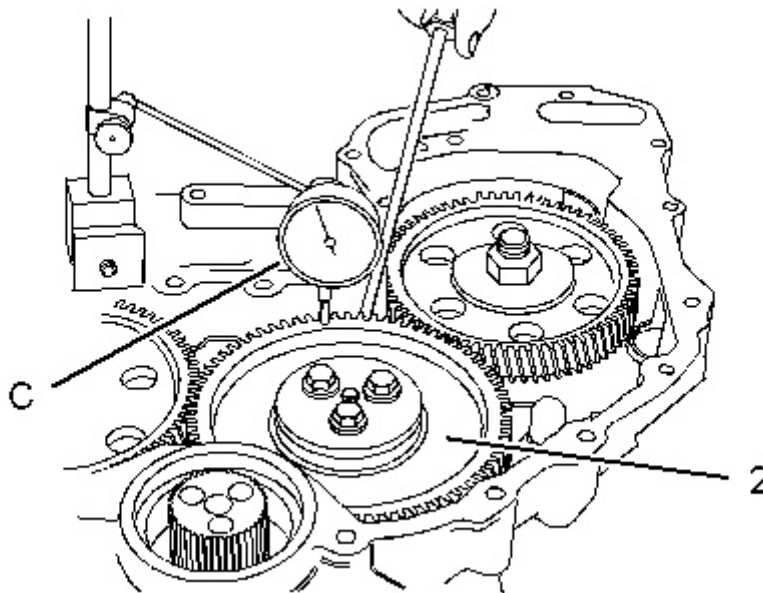


Illustration 4

g01269937

Checking end play by using a dial indicator group

8. Use Tooling (C) in order to check the end play of idler gear (2). Refer to Specifications, "Gear Group (Front)" for more information.
9. Use Tooling (C) in order to check the backlash between the idler gear and the camshaft gear. Refer to Specifications, "Gear Group (Front)" for more information.
10. Use Tooling (C) in order to check the backlash between the idler gear and the crankshaft gear. Refer to Specifications, "Gear Group (Front)" for more information.
11. Lightly lubricate all of the gears with clean engine oil.

End By:

- a. Install the fuel injection pump gear. Refer to Disassembly and Assembly, "Fuel Pump Gear - Install".
 - b. If the engine is equipped with an air compressor, install the air compressor. Refer to Disassembly and Assembly, "Air Compressor - Remove and Install".
 - c. If the engine is equipped with a vacuum pump, install the vacuum pump. Refer to Disassembly and Assembly, "Vacuum Pump - Remove and Install".
 - d. If the engine is equipped with an accessory drive, install the accessory drive. Refer to Disassembly and Assembly, "Accessory Drive - Remove and Install".
-

Product: VIBRATORY COMPACTOR

Model: CS-44 VIBRATORY COMPACTOR M4C

Configuration: CS44 CP44 Vibratory Soil Compactor M4C00001-UP (MACHINE) POWERED BY C4.4 Engine

Disassembly and Assembly C4.4 Engines for Caterpillar Built Machines

Media Number -KENR6082-19

Publication Date -01/10/2013

Date Updated -21/10/2013

i02930020

Idler Gear - Install

SMCS - 1206-012

Installation Procedure (Latest Heavy-Duty Idler Gear)

Table 1

Required Tools			
Tool	Part Number	Part Description	Qty
A	230-6284	Timing Pin (Camshaft)	1
B	136-4632	Timing Pin (Crankshaft)	1
	268-1966	Adapter	1
C	9U-7324	Indicator Bracket	1
	7H-1942	Dial Indicator	1
	3S-3268	Indicator Contact Point	1
	7H-1940	Universal Attachment	1

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

1. Ensure that number one piston is at the top center Position on the compression stroke. Refer to Systems Operation, Testing and Adjusting, "Finding Top Center Position for No. 1 Piston".

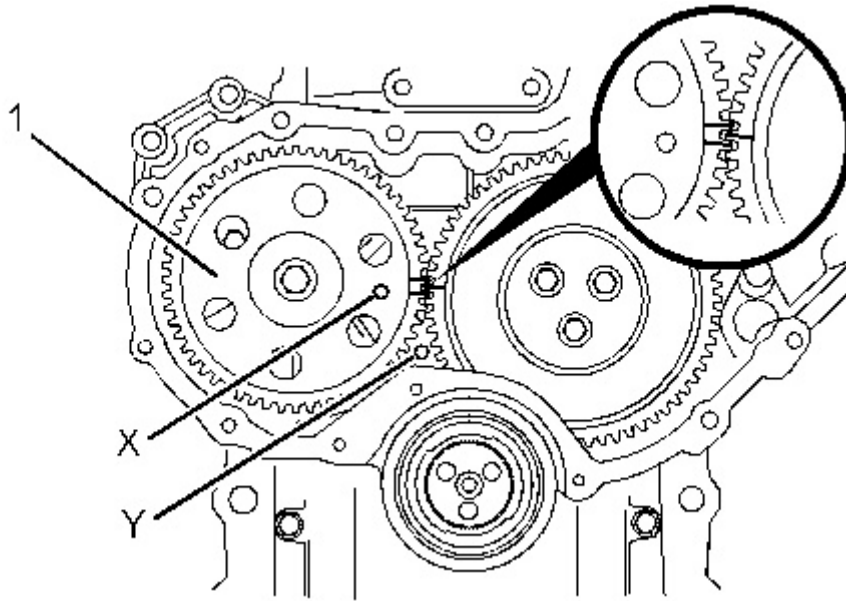
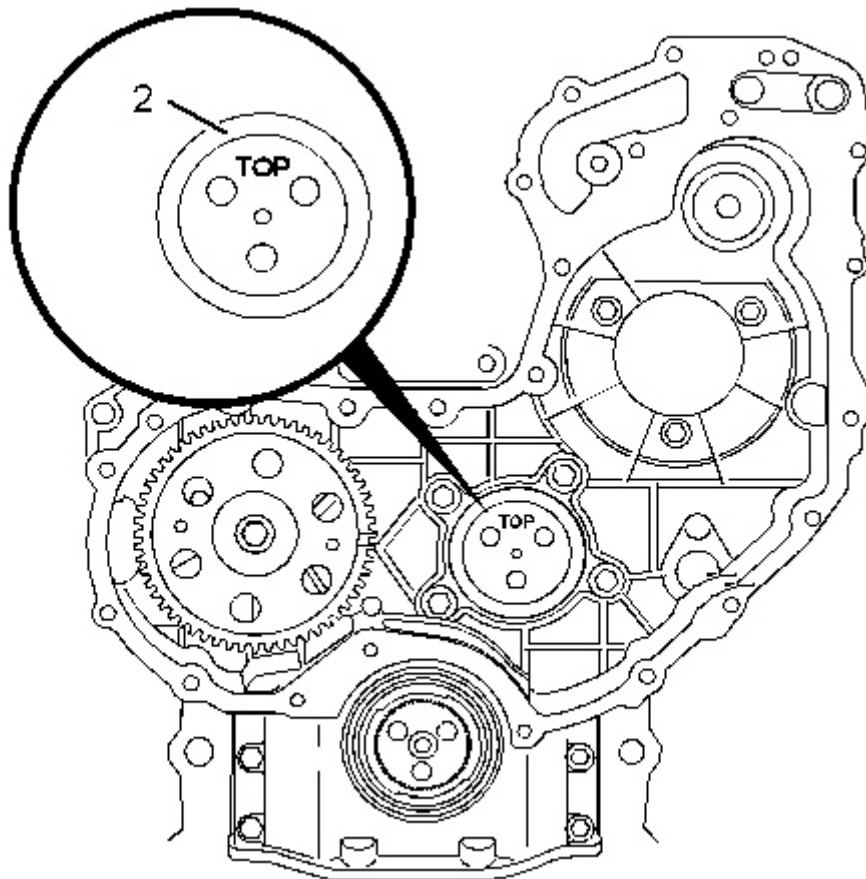


Illustration 1

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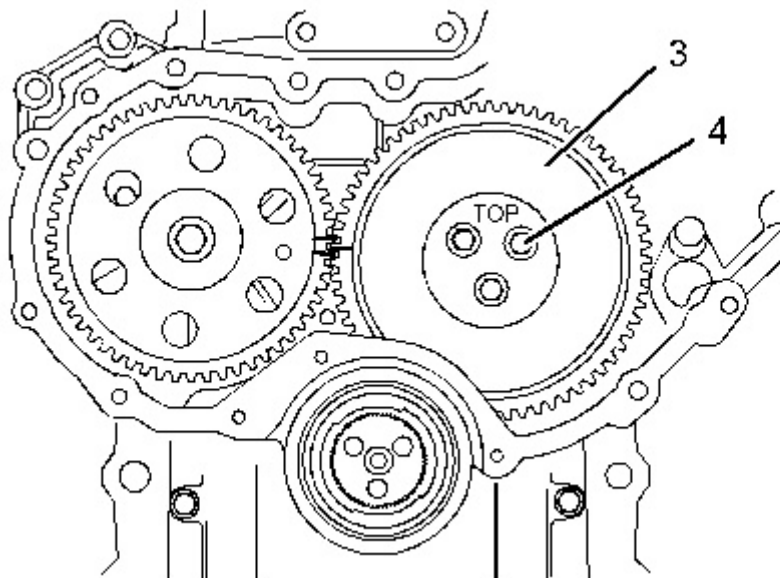
Alignment of timing marks

2. Ensure that Tooling (A) is installed into Hole (X) in camshaft gear (1).
3. Ensure that Tooling (B) is installed in Hole (Y) in the cylinder block. Use Tooling (B) in order to lock the crankshaft in the correct Position.

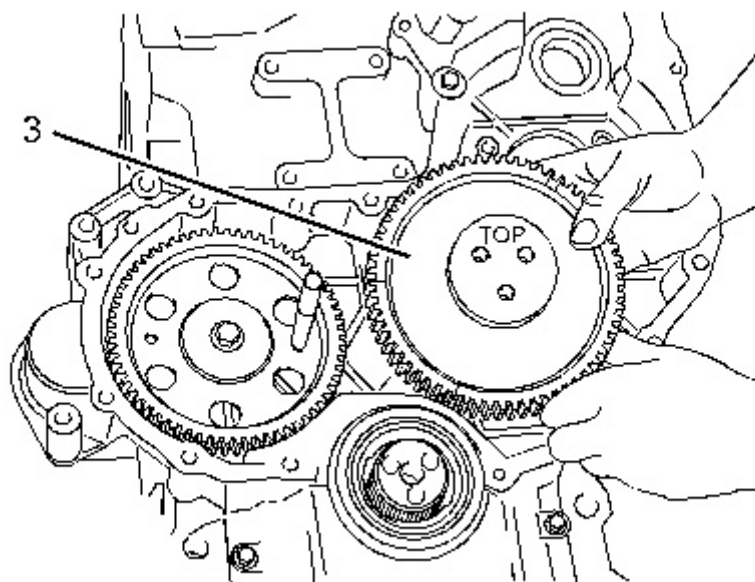


4. Install plate (2) into the recess in the front housing.

Note: Ensure that the identification mark TOP is upward.



5. Clean the assembly of idler gear (3) and inspect the assembly of the idler gear for wear or damage. Refer to Specifications, "Gear Group (Front)" for more information. If necessary, replace the assembly of the idler gear.
6. Lubricate the bearings in the assembly of idler gear (3) with clean engine oil.



Typical example

- Align the timing mark on idler gear (3) with the timing mark on the camshaft gear. Refer to Illustration 1. Install the assembly of idler gear (3) into the recess in the timing case. Ensure that the identification mark TOP is upward.

Note: The idler gear must be tilted during installation. Ensure that the holes in the assembly of the idler gear are aligned with the holes in the cylinder block.

- Install bolts (3). Tighten the bolts to a torque of 44 N·m (32 lb ft).

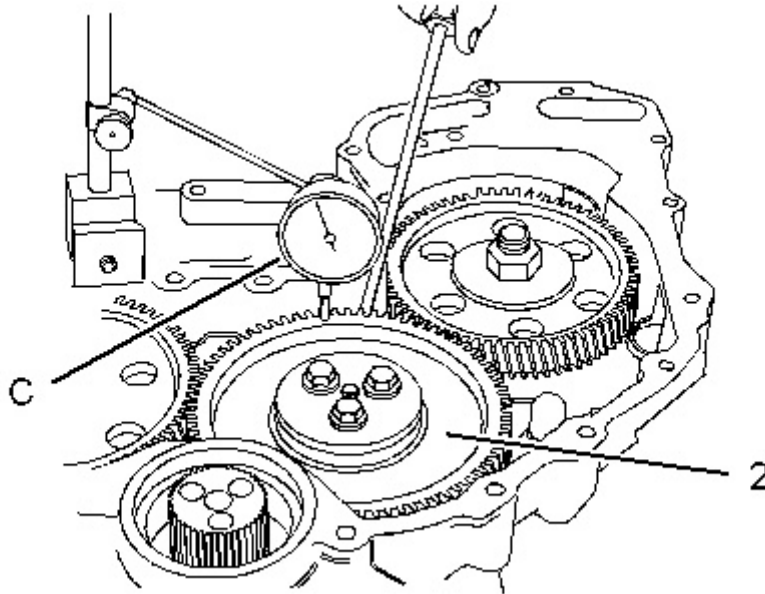


Illustration 5

g01269937

Checking end play by using a dial indicator group

- Use Tooling (C) in order to check the end play of idler gear (3). Refer to Specifications, "Gear Group (Front)" for more information.
- Use Tooling (C) in order to check the backlash between the idler gear and the camshaft gear. Refer to Specifications, "Gear Group (Front)" for more information.
- Use Tooling (C) in order to check the backlash between the idler gear and the crankshaft gear. Refer to Specifications, "Gear Group (Front)" for more information.
- Lightly lubricate all of the gears with clean engine oil.

End By:

- Install the fuel injection pump gear. Refer to Disassembly and Assembly, "Fuel Pump Gear - Install".
- If the engine is equipped with an air compressor, install the air compressor. Refer to Disassembly and Assembly, "Air Compressor - Remove and Install".

- c. If the engine is equipped with a vacuum pump, install the vacuum pump. Refer to Disassembly and Assembly, "Vacuum Pump - Remove and Install".
 - d. If the engine is equipped with an accessory drive, install the accessory drive. Refer to Disassembly and Assembly, "Accessory Drive - Remove and Install".
-

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