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924F

Service Manual

924F WHEEL LOADER

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Product: WHEEL LOADER
Model: 924F WHEEL LOADER 4YN
Configuration: 924F Wheel Loader 4YN00001-UP (MACHINE) POWERED BY 3114 Engine

Disassembly and Assembly
446 and 446B Backhoe Loaders, Lexion 450 Combine, 3114 and 3116 Engines, IT18F Integrated Toolcarrier, D6M Track-Type Tractor and 928F, 950F and 950G Wheel Loaders
Media Number -SENR3611-18 **Publication Date -01/05/2009** **Date Updated -27/05/2009**

i06818876

Aftercooler - Install

SMCS - 1063-012

Installation Procedure

Table 1

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
A	-	Loctite Gasket Sealant No.2	-
B	-	Loctite C5-A Copper Anti-Seize	-

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

Note: Use a new gasket to install the aftercooler.

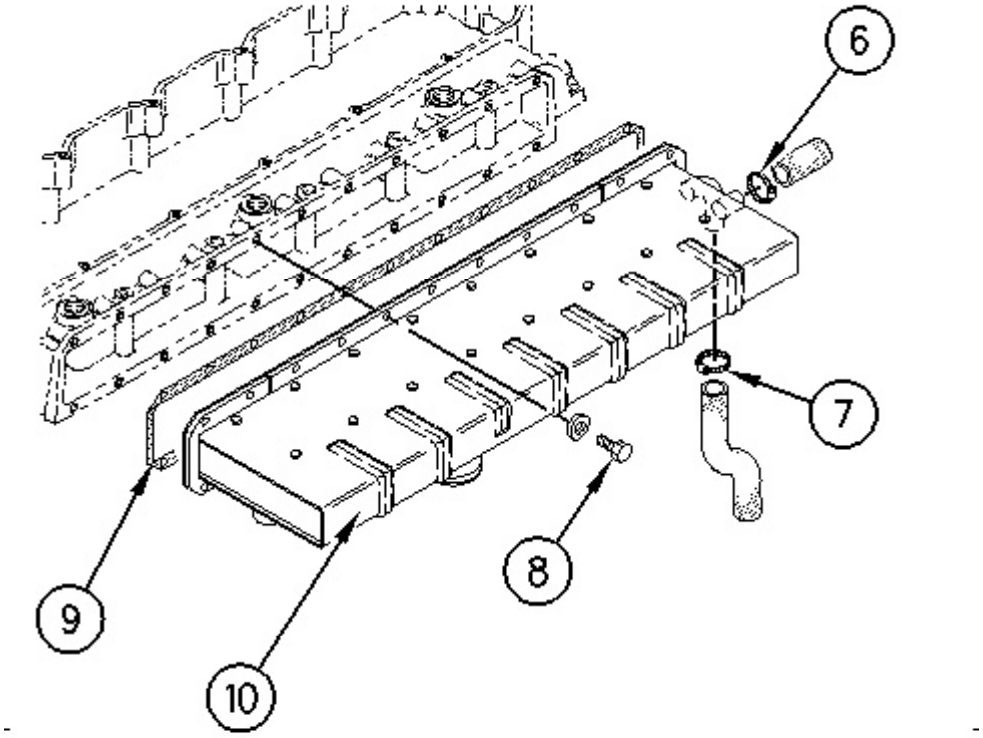

Illustration 1 g00746356

Note: Apply Tooling (A) to the threads of the bottom bolts before installation.

1. Install gasket (9) on the engine. Install aftercooler (10). Install bolts (8).
2. Tighten clamp (6) and tighten clamp (7).

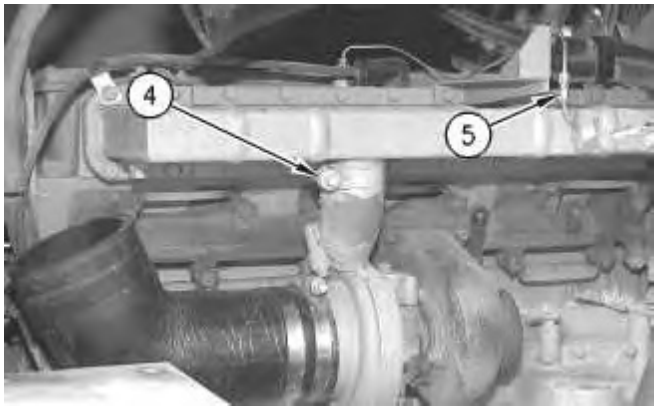

Illustration 2 g00746355

3. Tighten clamp (4).
4. Connect coupling (5).

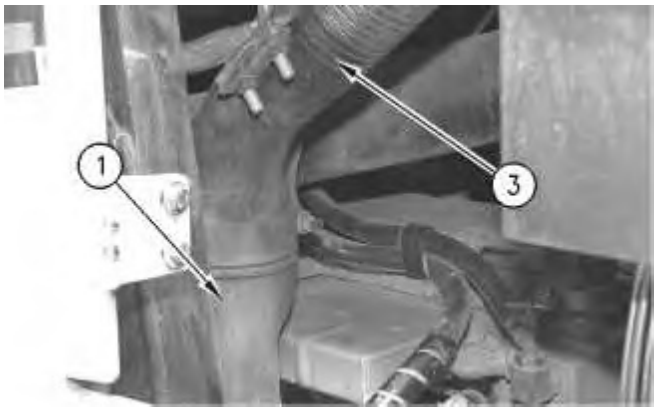

Illustration 3 g00508837

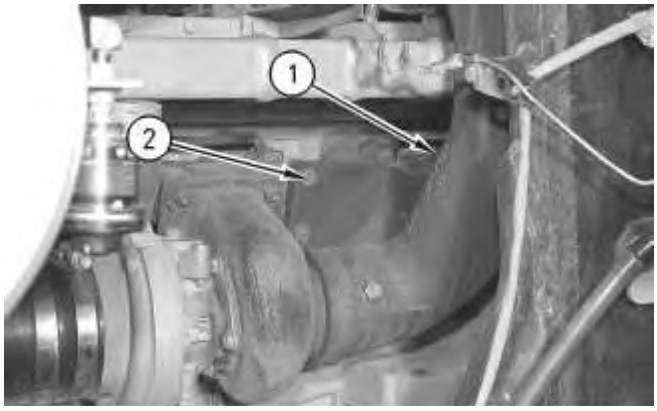

Illustration 4 g00508835

Note: Apply Tooling (B) to the threads of the exhaust elbow bolts.

5. Install exhaust elbow (1) and exhaust pipe (3). Install bolts (2).
6. Fill the cooling system. Refer to Operation and Maintenance Manual, SEBU7098, "Cooling System Level - Check" for the correct procedure.

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Product: WHEEL LOADER
Model: 924F WHEEL LOADER 4YN
Configuration: 924F Wheel Loader 4YN00001-UP (MACHINE) POWERED BY 3114 Engine

Disassembly and Assembly
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Media Number -SENR3611-18 **Publication Date -01/05/2009** **Date Updated -27/05/2009**

i01929472

Aftercooler - Remove

SMCS - 1063-011

Removal Procedure

Table 1

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
A	8T-0292	Bolt	2

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.

WARNING

At operating temperature, the engine coolant is hot and under pressure.

Steam can cause personal injury.

Check the coolant level only after the engine has been stopped and the fill cap is cool enough to touch with your bare hand.

Remove the fill cap slowly to relieve pressure.

Cooling system conditioner contains alkali. Avoid contact with the skin and eyes to prevent personal injury.

Note: Put identification marks on all hose assemblies, on all wires, and on all tube assemblies for installation purposes. Plug all hose assemblies and tube assemblies. This helps to prevent fluid loss and this helps to keep contaminants from entering the system.

1. Drain the coolant from the cooling system into a suitable container for storage or disposal.

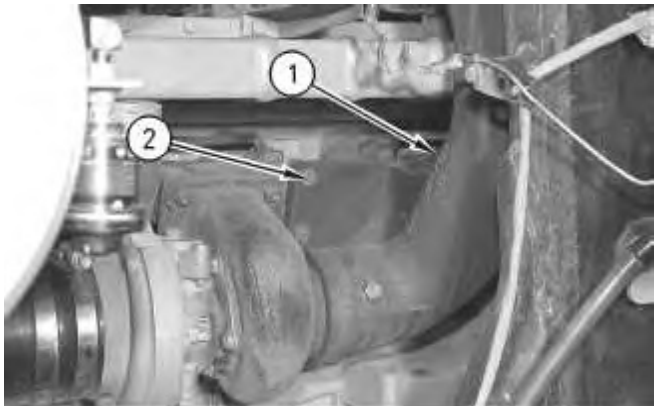

Illustration 1 g00508835

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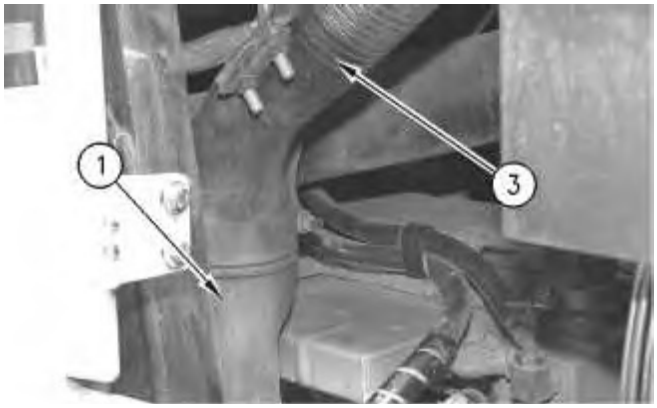

Illustration 2 g00508837

2. Remove bolts (2). Remove exhaust elbow (1) and exhaust pipe assembly (3).

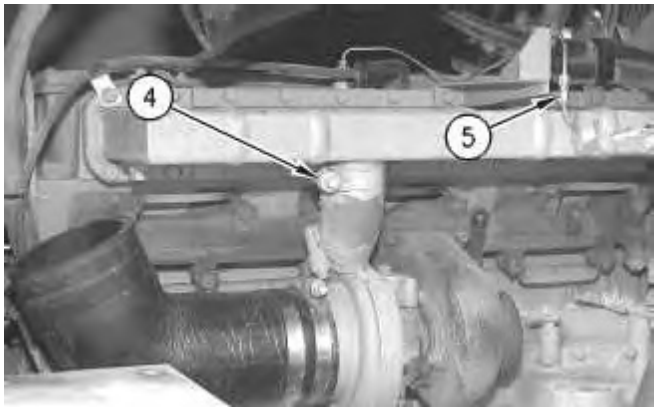

Illustration 3 g00746355

3. Loosen clamp (4).
4. Disconnect coupling (5).

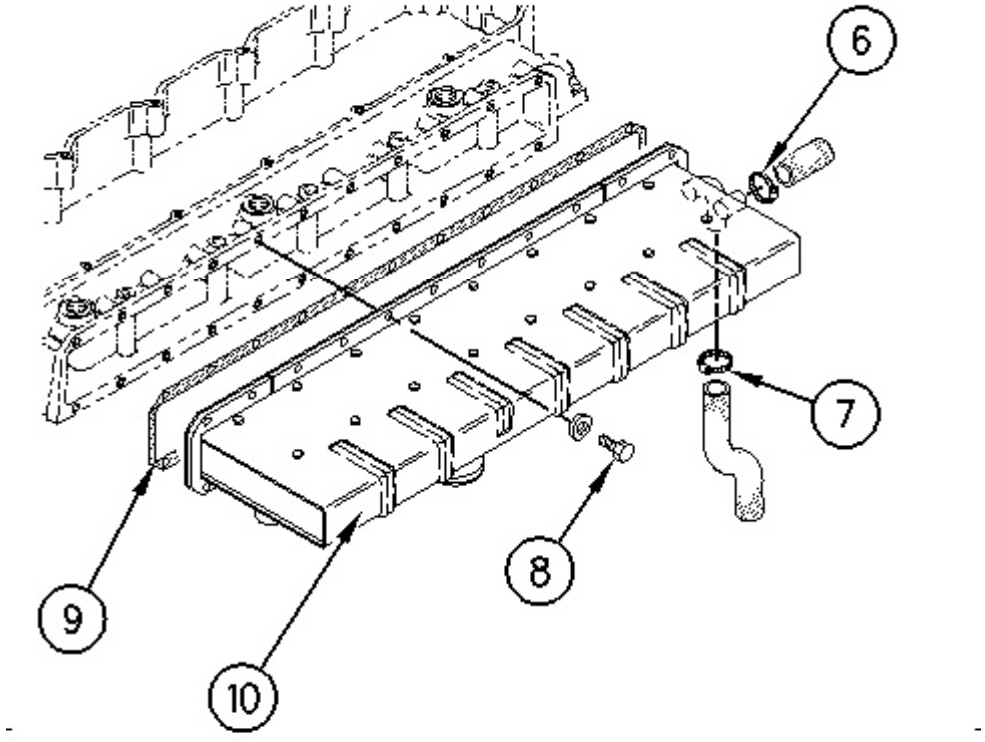

Illustration 4 g00746356

5. Loosen clamps (6) and (7).
6. Remove two top bolts (8) and install Tooling (A). Remove remaining bolts (8). Remove aftercooler (10).
7. Remove gasket (9) from aftercooler (10).

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Media Number -SENR3611-18 **Publication Date -01/05/2009** **Date Updated -27/05/2009**

i01931416

Air Compressor - Remove and Install

SMCS - 1803-010

Removal Procedure

WARNING

Do not disconnect the air lines until the air pressure in the system is at zero. If hose is disconnected under pressure it can cause personal injury.

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.

1. Remove the air pressure from the air tank and drain the coolant from the cooling system.

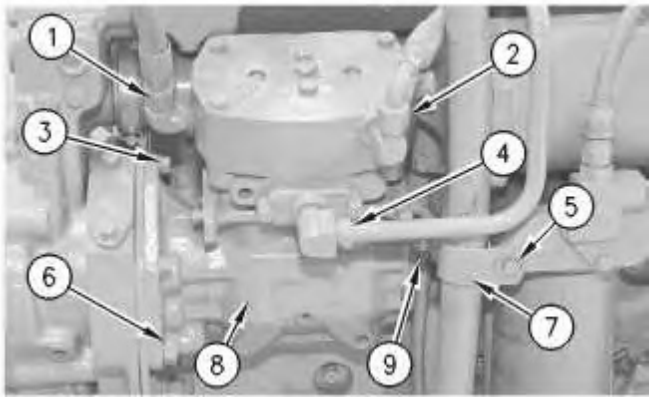

Illustration 1 g00484206

Typical example

2. Disconnect hose assemblies (1), (2) and (9) from the air compressor. Remove tube assembly (4) from the air compressor.
3. Remove bolt (5) and the washer. Remove clamp (7) from tube assembly for the breather. Move the tube assembly for the breather aside.
4. Remove bolts (3) and the washers that hold the air compressor to the timing gear housing.
5. Remove bolts (6) and remove air compressor (8) and the gasket from the engine.

Installation Procedure

Table 1

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
A	4C-4030	Thread Lock Compound	1

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

Note: Check the condition of the gaskets and O-ring seals. If gaskets or O-ring seals are damaged, use new parts for replacement.

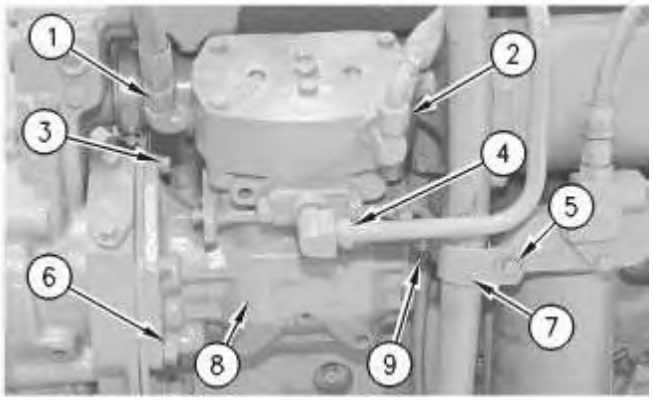

Illustration 2 g00484206

Typical example

1. Use bolts (3) and the washers to install air compressor (8). Apply Tooling (A) to the threads of bolts (6). Torque bolts (6) to 160 ± 30 N·m (118 ± 22 lb ft).
2. Install clamp (7) for the tube assembly for the breather with bolt (5) and the washer.
3. Install tube assembly (4) and connect hose assemblies (9), (2) and (1) to air compressor (8).

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Media Number -SENR3611-18 **Publication Date -01/05/2009** **Date Updated -27/05/2009**

i05024711

Air Compressor Drive Gear - Remove and Install

SMCS - 1803-010-GE

Removal Procedure

Table 1

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
A	1P-2320	Combination Puller	1
B	9S-1730	Socket	1

Start By:

A. Remove the air compressor.

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

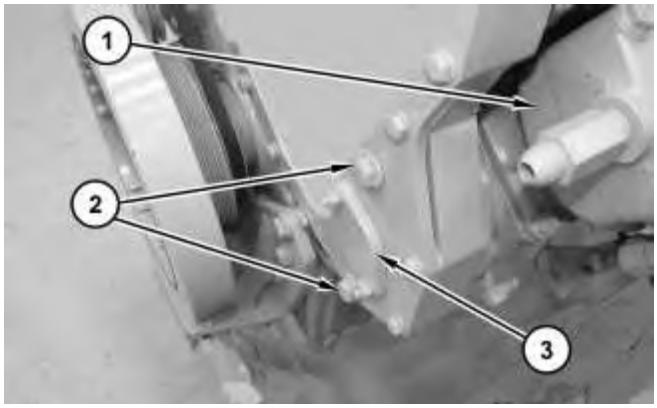

Illustration 1 g03196216

1. Temporarily install air compressor (1) with bolts (2) . Remove cover plate (3) .

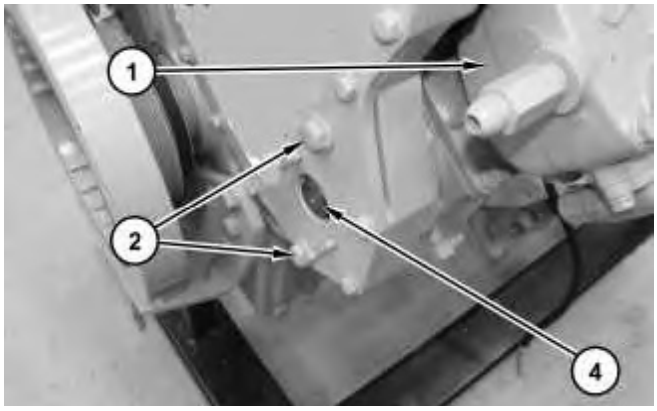

Illustration 2 g03196337

2. Loosen nut (2) . Remove bolts (2) and remove air compressor (1) .

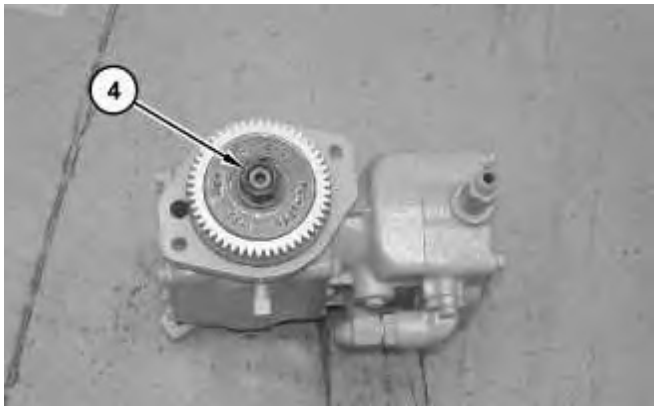

Illustration 3 g03196436

3. Remove nut (4) .

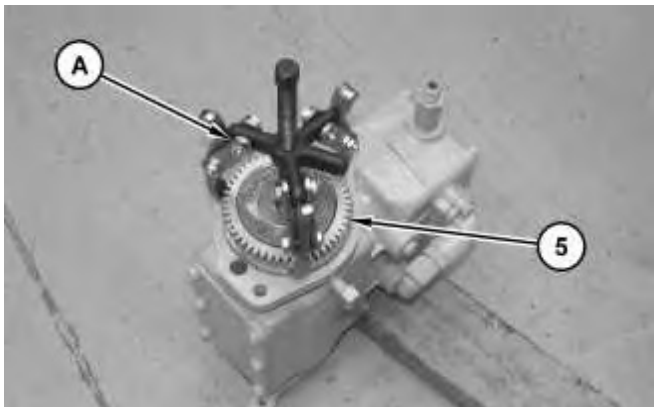

Illustration 4 g03196416

4. Use Tooling (A) in order to remove gear (5) .

Installation Procedure

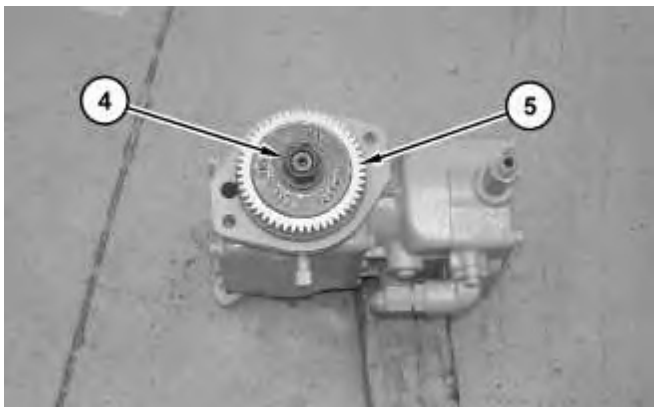

Illustration 5 g03196438

1. Clean the inside diameter of gear (5) and the shaft. Lube the washer and the shaft thread with engine oil. Position drive gear (5) on the air compressor, and install the washer and nut (4) . Tighten nut (4) hand tight.

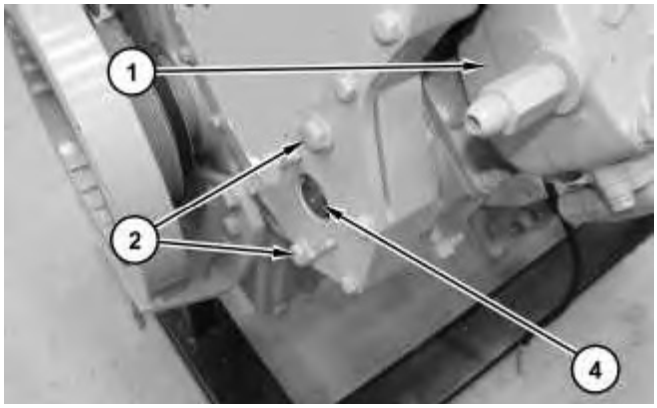

Illustration 6 g03196337

2. Install air compressor (1) and bolts (2) . Keep the engine from turning and tighten nut (4) to a torque of 170 ± 15 N·m (125 ± 11 lb ft)

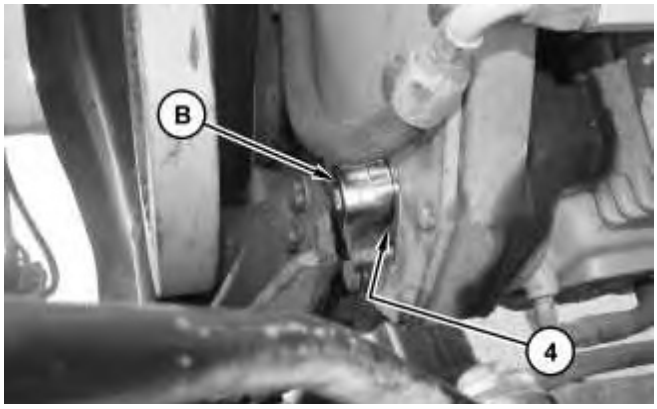

Illustration 7 g03196477

3. Install Tooling (B) onto nut (4) and tap one time a hammer.

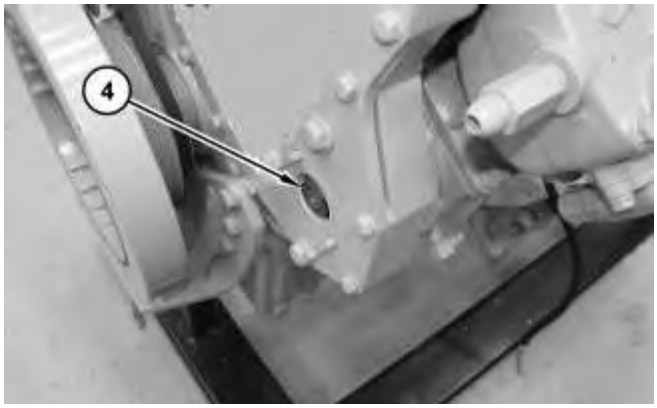

Illustration 8 g03196516

4. Keep the engine from turning and tighten nut (4) to a torque of170 ± 15 N·m (125 ± 11 lb ft)

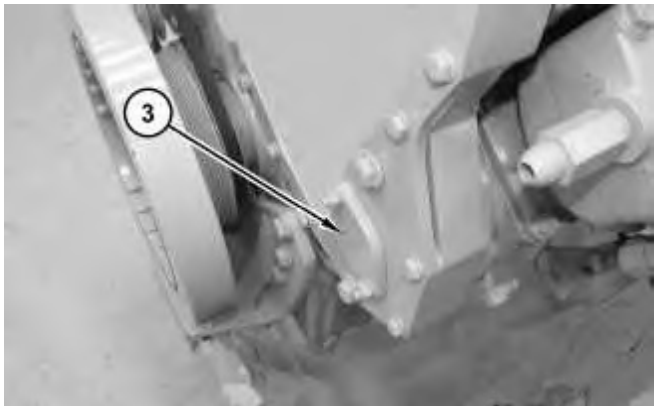

Illustration 9 g03196496

5. Install cover plate (3) .

End By: Install the air compressor.

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Media Number -SENR3611-18 **Publication Date -01/05/2009** **Date Updated -27/05/2009**

i01930386

Alternator - Remove and Install

SMCS - 1405-010

Removal Procedure

Table 1

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
A	168-0383	Circuit Breaker Bar	1

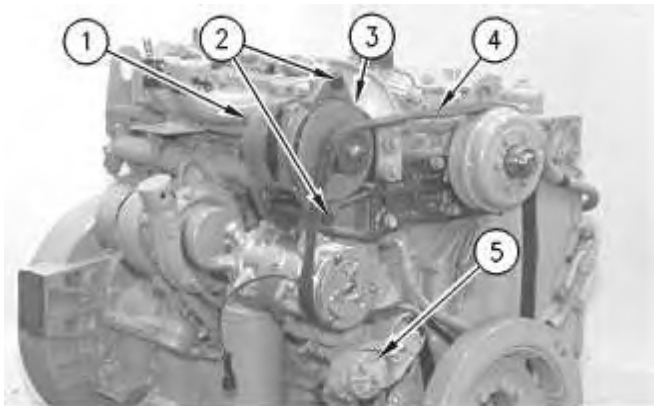

Illustration 1 g00609523
Typical Example

Note: Release the tension on the belt at the belt tightener, if the engine is not equipped with a belt tensioner.

1. Use Tooling (A) to release the tension on belt tensioner (5).
2. Remove drive belt (4) from the drive pulley on alternator (3).
3. Place an index mark on the wires of harness assembly (1) that are connected to the alternator. Disconnect harness assembly (1) from the alternator.
4. Remove bolts (2).
5. Remove alternator (3) from the mounting bracket.

Installation Procedure

Table 2

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
A	168-0383	Circuit Breaker Bar	1

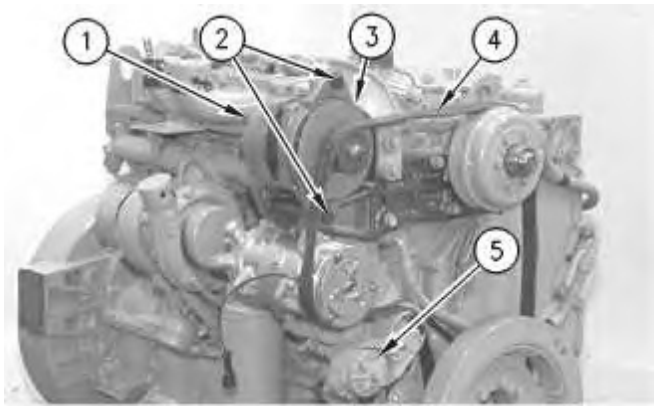

Illustration 2 g00609523

Typical example

1. Position alternator (3) on the mounting bracket. Install bolts (2).
2. Use Tooling (A) to install drive belt (4) on the drive pulley of the alternator.

Note: Adjust the tension on the drive belt if the engine is not equipped with a belt tensioner. Refer to the Operation and Maintenance Manual for the correct adjusting procedure.

3. Connect harness assembly (1) to the alternator. Use the index marks to correctly connect the harness assembly. Tighten the mounting bolt for the ground wire to a torque of 6.2 ± 0.6 N·m (54 ± 5 lb in). Tighten the mounting bolt for the battery wire to a torque of 11.3 ± 2.3 N·m (100 ± 20 lb in).

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Product: WHEEL LOADER
Model: 924F WHEEL LOADER 4YN
Configuration: 924F Wheel Loader 4YN00001-UP (MACHINE) POWERED BY 3114 Engine

Disassembly and Assembly
446 and 446B Backhoe Loaders, Lexion 450 Combine, 3114 and 3116 Engines, IT18F Integrated Toolcarrier, D6M Track-Type Tractor and 928F, 950F and 950G Wheel Loaders
Media Number -SENR3611-18 **Publication Date -01/05/2009** **Date Updated -27/05/2009**

i05977048

Bearing Clearance - Check

SMCS - 1203-535; 1219-535

Measurement Procedure

Table 1

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
A	198-9142	Plastic Gauge (Green) 0.025 to 0.076 mm (0.001 to 0.003 inch)	1
	198-9143	Plastic Gauge (Red) 0.051 to 0.152 mm (0.002 to 0.006 inch)	1
	198-9144	Plastic Gauge (Blue) 0.102 to 0.229 mm (0.004 to 0.009 inch)	1
	198-9145	Plastic Gauge (Yellow) 0.230 to 0.510 mm (0.009 to 0.020 inch)	1

Note: Plastic gauge may not be necessary when the engine is in the chassis.

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

Note: Cat does not recommend the checking of the actual bearing clearances particularly on small engines. This is because of the possibility of obtaining inaccurate results and the possibility of damaging the bearing or the journal surfaces. Each Cat engine bearing is quality checked for specific wall thickness.

Note: The measurements should be within specifications and the correct bearings should be used. If the crankshaft journals and the bores for the block and the rods were measured during disassembly, no further checks are necessary. However, if the technician still wants to measure the bearing clearances, Tooling (A) is an acceptable method. Tooling (A) is less accurate on journals with small diameters if clearances are less than 0.10 mm (0.004 inch).

NOTICE

Lead wire, shim stock or a dial bore gauge can damage the bearing surfaces.

The technician must be very careful to use Tooling (A) correctly. The following points must be remembered:

- Ensure that the backs of the bearings and the bores are clean and dry.
- Ensure that the bearing locking tabs are properly seated in the tab grooves.
- The crankshaft must be free of oil at the contact points of Tooling (A).

1. Put a piece of Tooling (A) on the crown of the bearing that is in the cap.

   Note: Do not allow Tooling (A) to extend over the edge of the bearing.

2. Use the correct torque-turn specifications in order to install the bearing cap. Do not use an impact wrench. Be careful not to dislodge the bearing when the cap is installed.

   Note: Do not turn the crankshaft when Tooling (A) is installed.

3. Carefully remove the cap, but do not remove Tooling (A). Measure the width of Tooling (A) while Tooling (A) is in the bearing cap or on the crankshaft journal. Refer to Illustration 1.

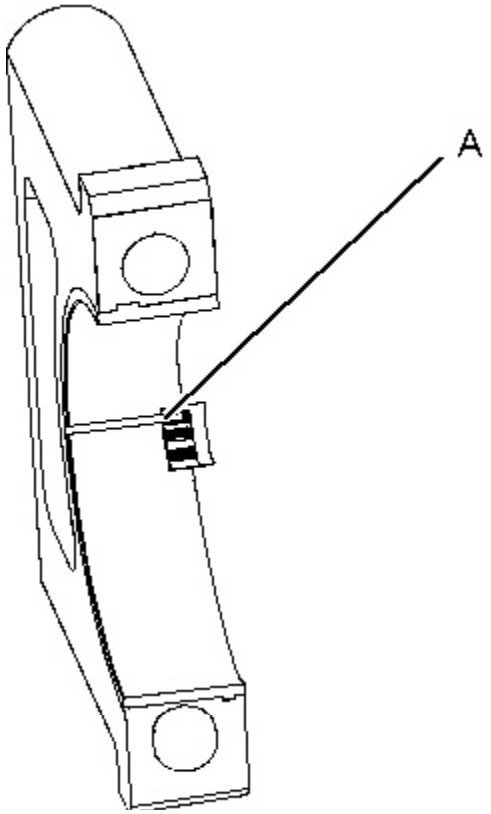

Illustration 1 g01152855

Typical Example

4. Remove all of Tooling (A) before you install the bearing cap.

   Note: When Tooling (A) is used, the readings can sometimes be unclear. For example, all parts of Tooling (A) are not the same width. Measure the major width in order to ensure that the parts are within the specification range. Refer to Specifications Manual, "Connecting Rod Bearing Journal" and Specifications Manual, "Main Bearing Journal" for the correct clearances.

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Product: WHEEL LOADER
Model: 924F WHEEL LOADER 4YN
Configuration: 924F Wheel Loader 4YN00001-UP (MACHINE) POWERED BY 3114 Engine

Disassembly and Assembly
446 and 446B Backhoe Loaders, Lexion 450 Combine, 3114 and 3116 Engines, IT18F Integrated Toolcarrier, D6M Track-Type Tractor and 928F, 950F and 950G Wheel Loaders
Media Number -SENR3611-18 **Publication Date -01/05/2009** **Date Updated -27/05/2009**

i01930316

Belt Tensioner - Remove and Install

SMCS - 1358-010

Removal Procedure

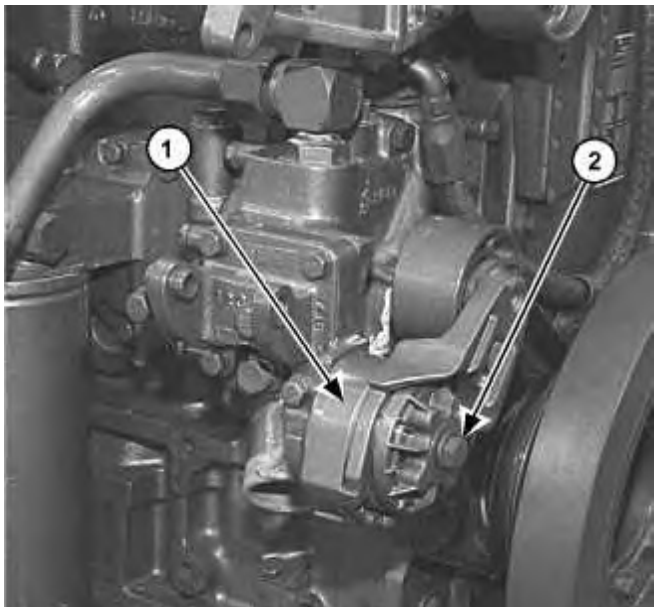

Illustration 1 g01011962

1. Use a breaker bar to release the tension on belt tensioner (1). Remove the drive belt.
2. Remove bolt (2) and belt tensioner (1).

Installation Procedure

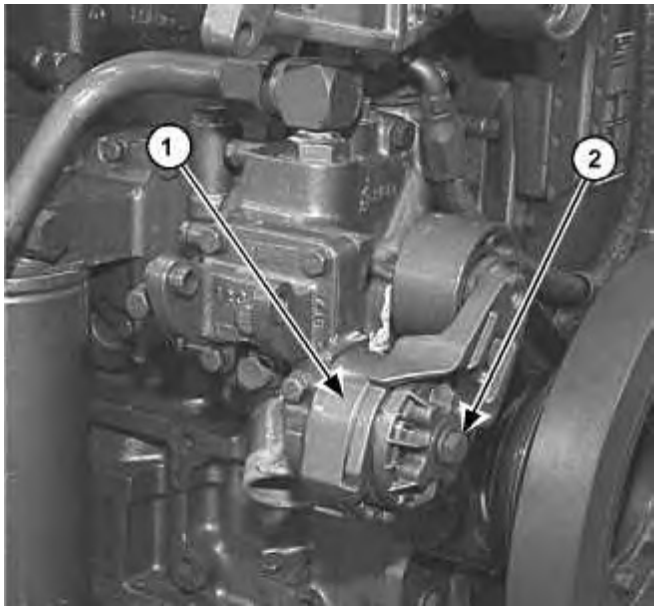

Illustration 2 g01011962

1. Position belt tensioner (1) on the cylinder block. Install bolt (2).
2. Install the drive belt. Use a breaker bar to release tension on belt tensioner (1).

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Media Number -SENR3611-18 **Publication Date -01/05/2009** **Date Updated -27/05/2009**

i01930280

Belt Tightener - Install

SMCS - 1358-012

Installation Procedure

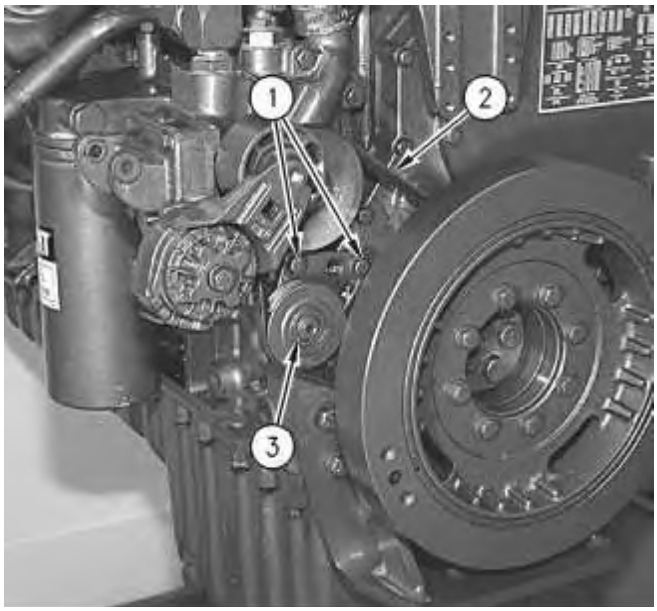

Illustration 1 g00619355

1. Position water pump belt tightener (3) and install V-belt (2) on the pulley of water pump belt tightener (3).
2. Install bolts (1) that hold water pump belt tightener (3) to the timing gear housing.

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