FINNING CAT

Service Information System

Shutdown SIS

Previous Screen

Product: WHEEL LOADER
Model: 950H WHEEL LOADER J5J
Configuration: 950H WHEEL LOADER J5J00001-UP (MACHINE) POWERED BY C7 ENGINE

Troubleshooting
950H Wheel Loader, 962H Wheel Loader and IT62H Integrated Toolcarrier Electrohydraulic System

Media Number -RENR8878-11 **Publication Date -01/10/2011** **Date Updated -27/10/2011**

i02408627

MID 082 - CID 0562 - FMI 14

SMCS - 7490-038

Conditions Which Generate This Code:

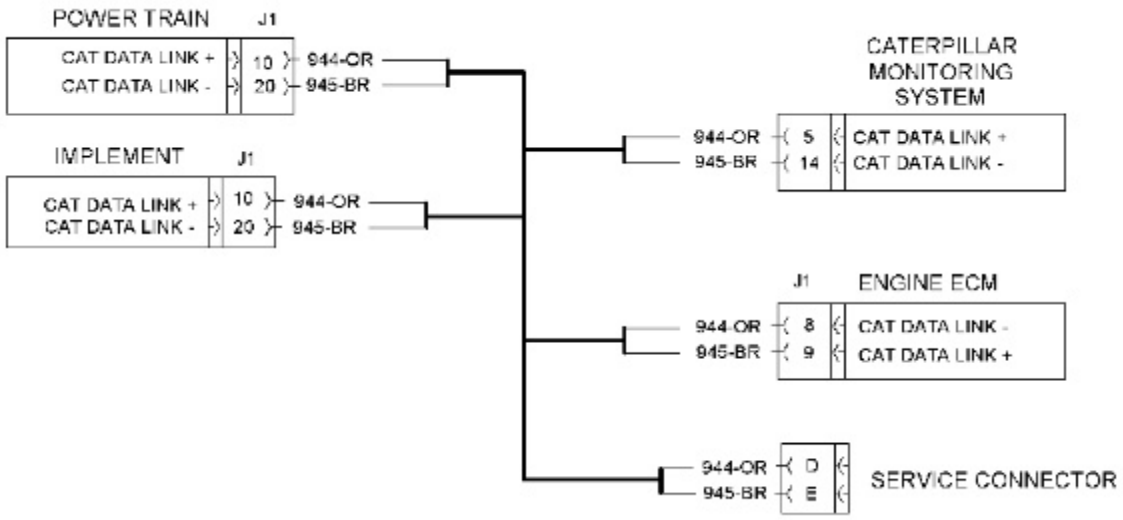

Illustration 1 g01196560

Schematic of the Cat Data Link Circuit

This diagnostic code is recorded when the Caterpillar Monitoring System is not sending parameters to the Implement ECM at the proper rate. The update rate for parameters that are generated by the

- Heater element
- Coolant temperature sensor
- Inlet air temperature sensor
- ECM
- Indicator lamp

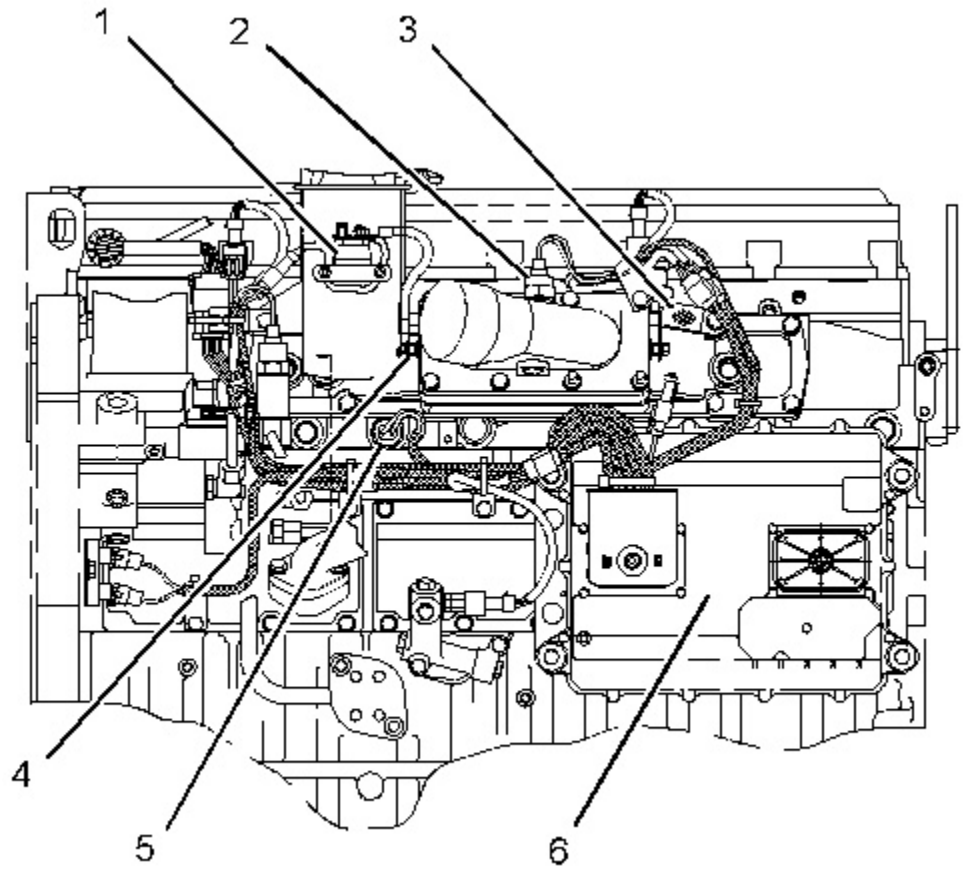

Illustration 5 g01139807

Location Of Components

(1) Relay of the air inlet heater

(2) Inlet air temperature sensor

(3) Ground strap (heater to engine)

(4) Air inlet heater

(5) Coolant temperature sensor

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, "Caterpillar Dealer Service Tool Catalog" for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

Before you begin inspection of the turbocharger, be sure that the inlet air restriction is within the specifications for your engine. Be sure that the exhaust system restriction is within the specifications for your engine. Refer to Systems Operation/Testing and Adjusting, "Air Inlet and Exhaust System - Inspect".

The condition of the turbocharger will have definite effects on engine performance. Use the following inspections and procedures to determine the condition of the turbocharger.

- Inspection of the Compressor and the Compressor Housing
- Inspection of the Turbine Wheel and the Turbine Housing
- Inspection of the Wastegate

Inspection of the Compressor and the Compressor Housing

Remove air piping from the compressor inlet.

Ensure that the constant torque hose clamps are tightened to the correct torque. Check the welded joints for cracks. Ensure that the brackets are tightened in the correct positions. Ensure that the brackets are in good condition. Use compressed air to clean any debris or any dust from the aftercooler core assembly. Inspect the cooler core fins for the following conditions:

- Damage
- Debris
- Corrosion

Use a stainless steel brush to remove any corrosion. Ensure that you use soap and water.

Note: When parts of the air-to-air aftercooler system are repaired, a leak test is recommended. When parts of the air-to-air aftercooler system are replaced, a leak test is recommended.

The use of winter fronts or shutters is discouraged with air-to-air aftercooled systems.

Inlet Manifold Pressure

Normal inlet manifold pressure with high exhaust temperature can be caused by blockage of the fins of the aftercooler core. Clean the fins of the aftercooler core. Refer to "Visual Inspection" for the cleaning procedure.

Low inlet manifold pressure and high exhaust manifold temperature can be caused by any of the following conditions:

Plugged air cleaner - Clean the air cleaner or replace the air cleaner, as required. Refer to the Operation and Maintenance Manual, "Engine Air Cleaner Element - Clean/Replace".

Blockage in the air lines - Blockage in the air lines between the air cleaner and the turbocharger must be removed.

Aftercooler core leakage - Aftercooler core leakage should be pressure tested. Refer to "Aftercooler Core Leakage" topic for the testing procedure.

Leakage of the induction system - Any leakage from the pressure side of the induction system should be repaired.

Inlet manifold leak - An inlet manifold leak can be caused by the following conditions: loose fittings and plugs, missing fittings and plugs, damaged fittings and plugs and leaking inlet manifold gasket.

Aftercooler Core Leakage

Worn Piston Rings

Piston rings that have excessive wear can cause too much pressure in the crankcase. The additional pressure in the crankcase will cause more than the normal amount of crankcase blowby from the crankcase breather. Use the **8T-2700** Blowby/Air Flow Indicator to check the amount of crankcase blowby. The test procedure is in Special Instruction, SEHS8712. Inspect piston rings and install new parts, as required.

Scored Cylinder Walls or Worn Cylinder Walls

Inspect the cylinder liners for damage. Hone the cylinder liners in order to remove the scoring. If necessary, install new liners.

Wed Dec 11 17:02:34 UTC+0400 2019

If the misfiring cylinder can be isolated to a specific cylinder, refer to Troubleshooting, "Injector Solenoid Circuit - Test".

Combustion Problem

Check for combustion problems.

Examples of combustion problems are shown in the following list:

- Outside temperatures are too cold.
- Mechanical problem

Air Inlet Heater

1. Inspect the wiring for the air inlet heater for damage or bad connections.
2. Connect the electronic service tool.
3. Check the coolant temperature sensor and the intake air temperature sensor for proper operation.
4. Check the element inside the air inlet heater.
5. Check the air inlet heater relay for proper operation. Refer to Troubleshooting, "Air Inlet Heater Circuit - Test".

Air Inlet Restriction

Check the air inlet system for restrictions. Refer to Testing and Adjusting, "Air Inlet and Exhaust System - Inspect".

Cold Mode

The ECM will set the cold start strategy when the coolant temperature is below 18 °C (64 °F).

When the cold start strategy is activated, low idle rpm will be increased to 1000 rpm and the engines power will be limited.

Cold mode operation will be deactivated when any of the following conditions have been met:

- Coolant temperature reaches 18 °C (64 °F).
- The engine has been running for fourteen minutes.

Cold mode operation varies the fuel injection amount for white smoke cleanup. Cold mode operation also varies the timing for white smoke cleanup. Usually, the engine operating temperature is reached before the walk-around inspection is completed. The engine will idle at the programmed low idle rpm in order to be put in gear.

Expected Result:

No diagnostic codes are present.

Results:

- **OK -** Proceed to Test Step 2.
- **Not OK -**

  Repair: Repair the diagnostic codes that are present. Refer to the appropriate topic in the "Troubleshooting With a Diagnostic Code" section of this manual.Ensure that the repair eliminates the problem.

  STOP

Test Step 2. Perform a Check of the Aftercooler.

A. Perform a check of the aftercooler. Refer to the section on the aftercooler in Systems Operation/Testing and Adjusting.

Expected Result:

There are no problems with the aftercooler.

Results:

- **OK -** There may be an intermittent problem.

  Repair: Monitor the operation of the engine.Repair the problem.Ensure that the repair eliminates the problem.

  STOP

- **Not OK -**

  Repair: Repair the problem.Ensure that the repair eliminates the problem.

  STOP

Wed Dec 11 17:03:05 UTC+0400 2019

Product: WHEEL LOADER
Model: 950G II WHEEL LOADER BAA
Configuration: 950G II WHEEL LOADER BAA00001-UP (MACHINE) POWERED BY 3126B Engine

Disassembly and Assembly
950G Series II Wheel Loader, 962G Series II Wheel Loader and IT62G Series II Integrated Toolcarrier Engine Supplement
Media Number -RENR4307-04 **Publication Date -01/08/2006** **Date Updated -31/08/2006**

i01625643

Air Cleaner - Remove and Install

SMCS - 1051-010

Removal Procedure

Start By:

A. Connect the steering frame lock. Refer to Disassembly and Assembly, "Steering Frame Lock - Separate and Connect".

1. Open the engine hood.

Illustration 1 g00841579

2. Remove precleaner assembly (1) .

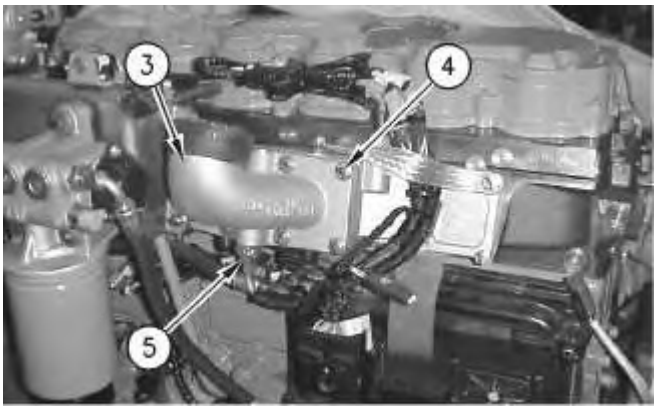

Illustration 3 g00728030

3. Position air inlet elbow (3) on the air inlet cover.
4. Install eight bolts (4).
5. Connect plug (5) to the air temperature sensor.

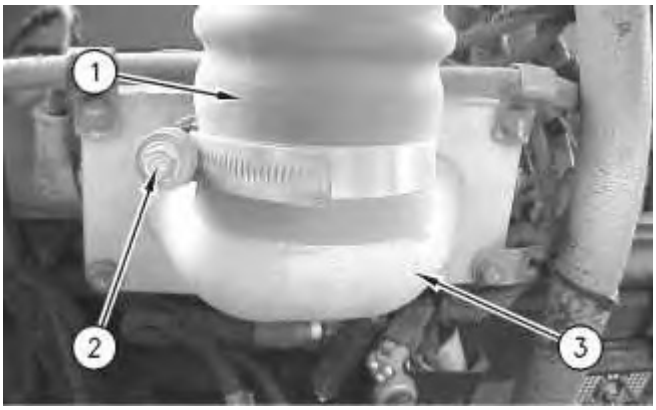

Illustration 4 g00728048

6. Install hose (1) on air inlet elbow (3). Tighten hose clamp (2).

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3. Remove the bolts and air inlet cover (3).

Installation Procedure

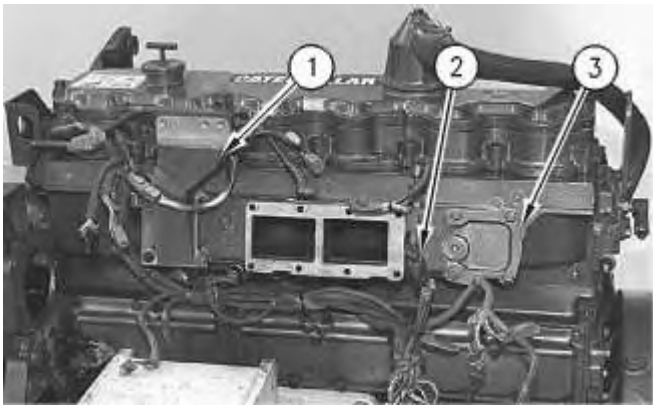

Illustration 2 g00618364

1. Inspect the gasket for air inlet cover (3). Replace the gasket, if necessary.
2. Position air inlet cover (3), mounting bracket (1) for fuel filter base, and the wiring clip on the cylinder head. Install the bolts.
3. Connect harness assembly (2) for the boost sensor.

End By:

a. Install the fuel filter base. Refer to Disassembly and Assembly, "Fuel Filter Base - Remove and Install".

b. Install the air inlet heater. Refer to Disassembly and Assembly, "Air Inlet Heater - Remove and Install".

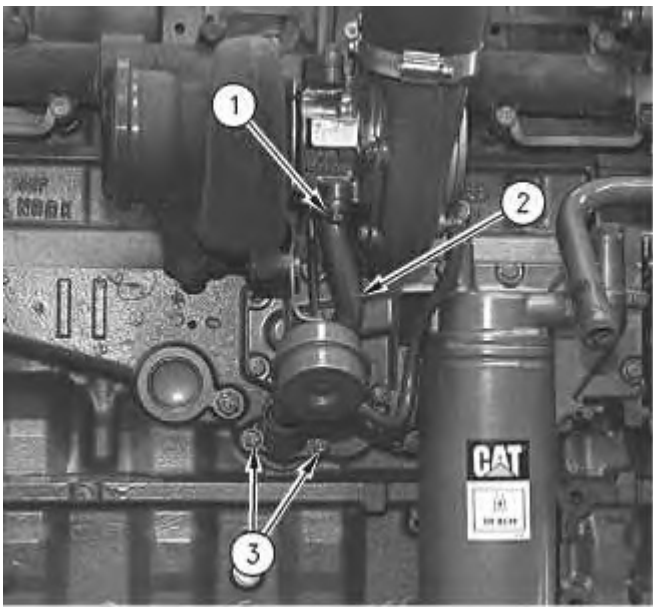

Illustration 1 g00617515

1. Remove bolts (1) and the gasket. Remove bolts (3) and tube assembly (2) from the turbocharger.

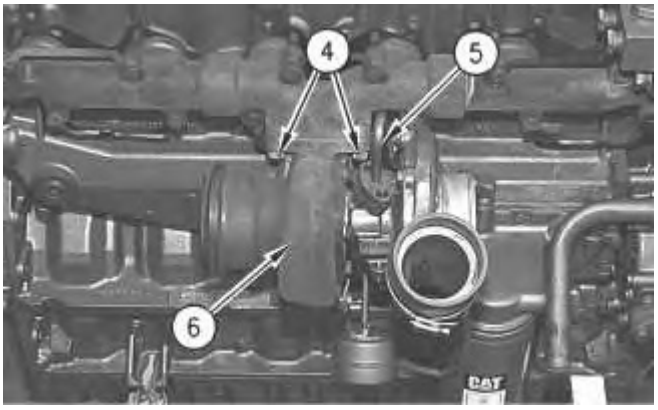

Illustration 2 g00617565

2. Remove the bolts and the gasket in order to disconnect oil supply tube assembly (5) from the turbocharger.

3. Remove nuts (4), turbocharger (6), and the gasket from the exhaust manifold.

Product: WHEEL LOADER
Model: 950G II WHEEL LOADER BAA
Configuration: 950G II WHEEL LOADER BAA00001-UP (MACHINE) POWERED BY 3126B Engine

Systems Operation
3126B Engines for CaterpillarBuilt Machines
Media Number -SENR9580-04 **Publication Date -01/04/2008** **Date Updated -07/04/2008**

i01457465

Basic Engine

SMCS - 1200

Cylinder Block And Head

The cylinder block has seven main bearings. The main bearing caps are fastened to the cylinder block with two bolts per cap.

Removal of the oil pan allows access to the crankshaft, the main bearing caps, the piston cooling jets, and the oil pump.

The camshaft is accessible through the covers on the left side of the cylinder block. These side covers support the pushrod lifters. The camshaft is supported by bearings that are pressed into the cylinder block. There are seven camshaft bearings.

The cylinder head is separated from the cylinder block by a nonasbestos fiber gasket with a steel backing. Coolant flows out of the cylinder block through gasket openings and into the cylinder head. This gasket also seals the oil supply and drain passages between the cylinder block and the cylinder head.

The air inlet ports are on the left side of the cylinder head, while the exhaust ports are located on the right side of the cylinder head. There are two inlet valves and one exhaust valve for each cylinder. Replaceable valve guides are pressed into the cylinder head. The hydraulically actuated electronically controlled unit injector is located between the three valves. Fuel is injected directly into the cylinders at very high pressure. A pushrod valve system controls the valves.

Piston, Rings And Connecting Rods

One-piece aluminum pistons are used in most applications. Engines with higher cylinder pressures require two-piece pistons. Refer to the Parts Manual in order to obtain information about the type of pistons that are used in a specific engine.

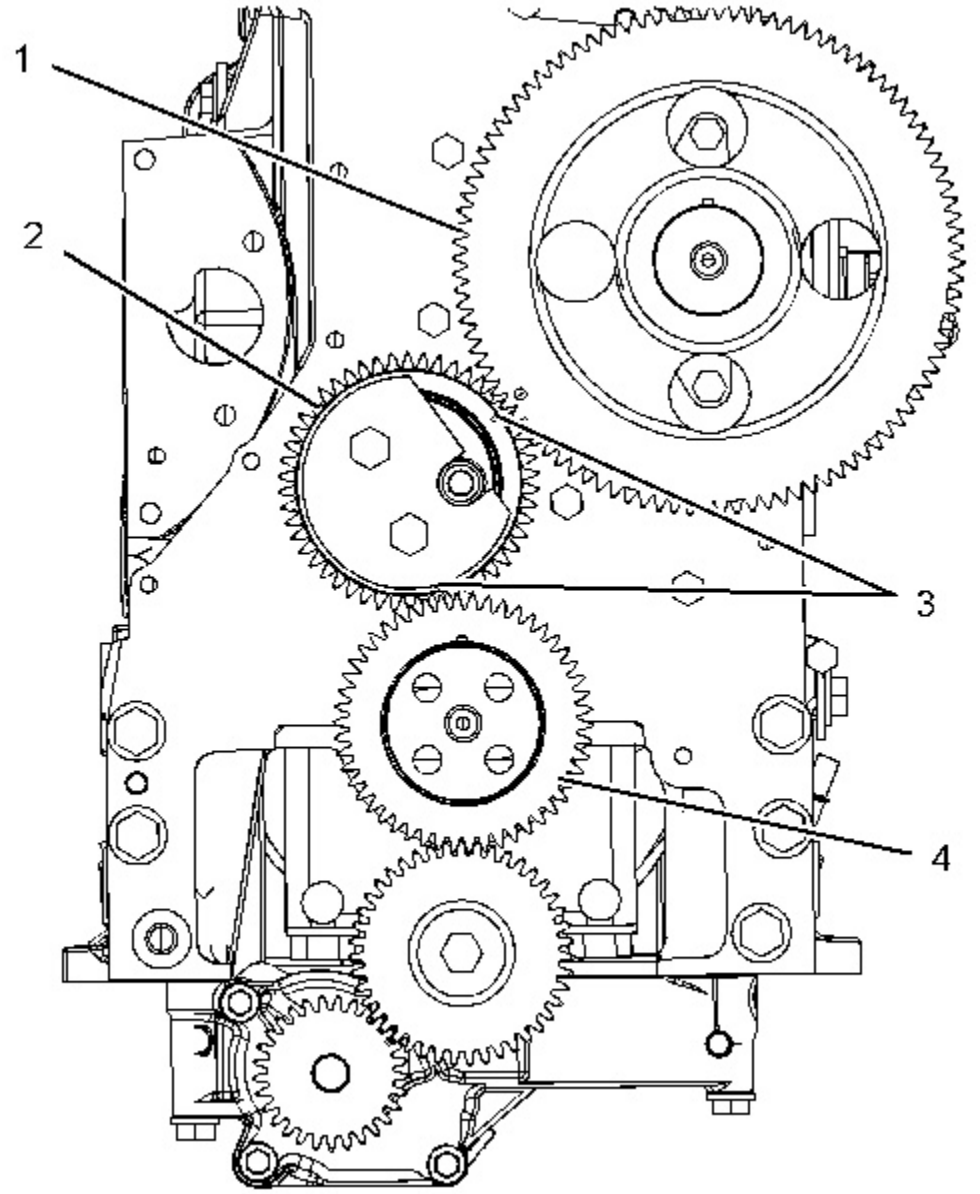

Illustration 1 g01134615

Front gear group
(1) Camshaft gear and timing reference gear
(2) Idler gear
(3) Timing marks
(4) Crankshaft gear

Correct fuel injection timing and correct valve mechanism operation is determined by the timing reference gear and the alignment of the front gear group. The timing reference gear is located on the camshaft gear. The timing reference gear is used to measure crankshaft rotation. During installation of the front gear, timing marks (3) on idler gear (2) must be in alignment with the timing marks on crankshaft gear (4) and the timing marks on camshaft gear (1).

Check the teeth on the timing reference gear. The teeth should not be defaced. The teeth should have sharp clean edges and the teeth should be free of contaminants.

FINNING CAT

Service Information System

Shutdown SIS

Previous Screen

Product: WHEEL LOADER
Model: 950G II WHEEL LOADER BAA
Configuration: 950G II WHEEL LOADER BAA00001-UP (MACHINE) POWERED BY 3126B Engine

Testing and Adjusting

3126B Engines for CaterpillarBuilt Machines

Media Number -SENR9580-04 **Publication Date -01/04/2008** **Date Updated -07/04/2008**

i01432013

Piston Ring Groove - Inspect

SMCS - 1214-040

The **186-0190** Piston Ring Groove Gauge Gp is available to check the top ring groove in the piston. Refer to the instruction card with the tool for the correct use of the **186-0190** Piston Ring Groove Gauge Gp.

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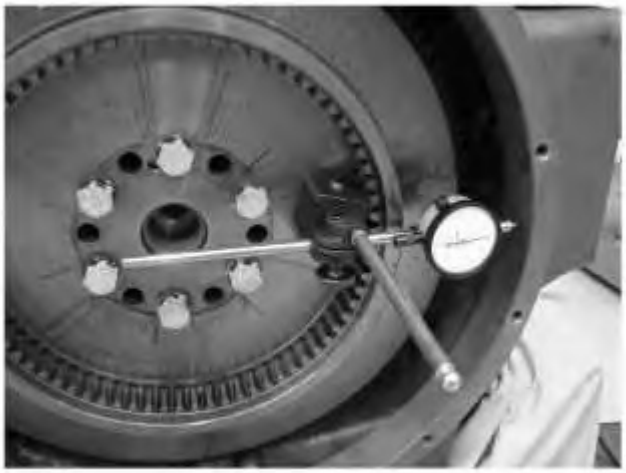


Illustration 3 g02170195

8T-5096 Dial Indicator

1. Fasten a dial indicator to the flywheel so the anvil of the dial indicator will contact the bore of the flywheel housing.

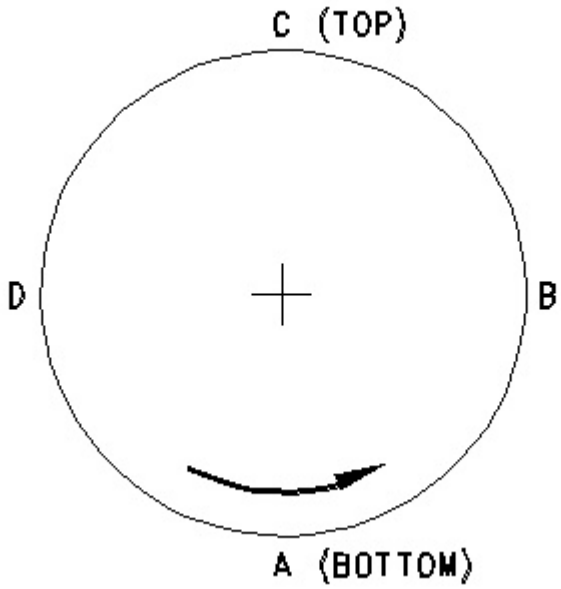


Illustration 4 g00285932

Checking bore runout of the flywheel housing

Wed Dec 11 17:08:48 UTC+0400 2019

Product: WHEEL LOADER
Model: 950G II WHEEL LOADER BAA
Configuration: 950G II WHEEL LOADER BAA00001-UP (MACHINE) POWERED BY 3126B Engine

Specifications

3126B Engine for Caterpillar Built Machines

Media Number -SENR9579-05 **Publication Date -01/01/2005** **Date Updated -28/01/2005**

i07142159

Belt Tension Chart

SMCS - 1357

Table 1

Specification for the 7N-9693 Tension Chart			
Item	**Qty**	**Part**	**Specification Description**
-	-	-	The new belt tension chart has been standardized. The belt tension chart eliminates confusion about the correct belt tension to use. Studies were completed with different belt suppliers and the information that was gathered from the studies was developed into a new belt tension for each belt size. The chart does not apply to belts that use a spring loaded tensioner. For more accurate results, a Clavis frequency gauge should be used in order to measure the natural frequency of the belt. By the use of a formula, the natural frequency is converted into the belt tension force. If the Clavis frequency gauge cannot be used, then use the appropriate Kent-Moore belt tension gauge to measure the belt tension force. When matched sets of belts are used, check the tension of all the belts in order to verify that the lowest belt is in the acceptable tolerance range. Variations in tension between the belts can vary by as much as 65 lbs. In order to determine the tension of a "banded" belt, refer to the chart above. Multiply the tension value of the belt by the number of belts that are banded together.Two 1/2 inch belts would require a used belt tension equal to twice the value of the used belt tension for one 1/2 inch belt (2 X 80 = 160 lb).

Table 2

Belt Tension Chart	Field Service Tension Check

Wed Dec 11 17:36:32 UTC+0400 2019

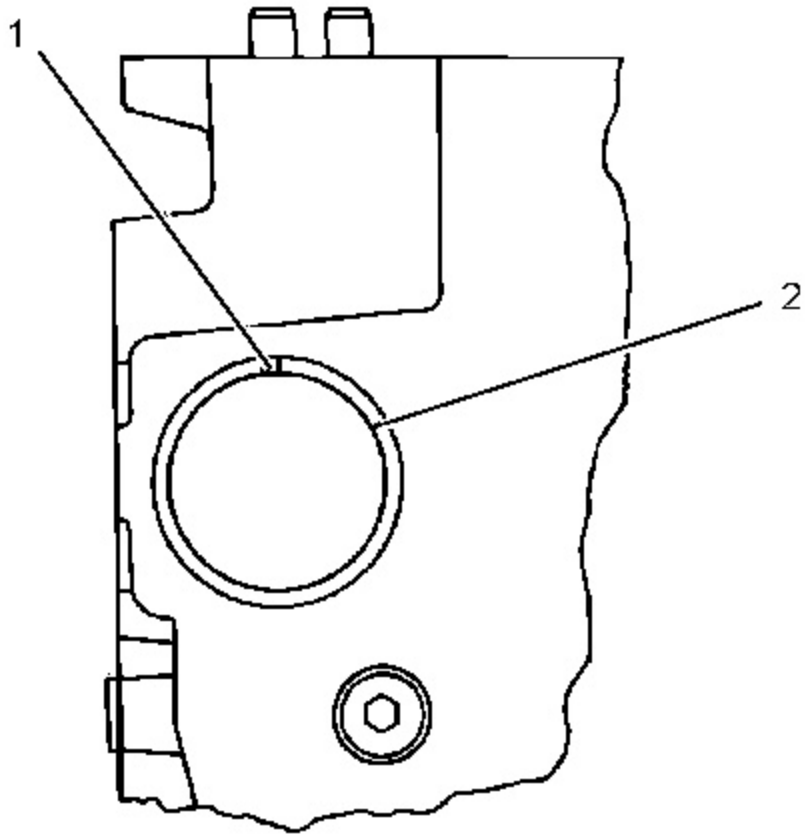


Illustration 1 g01104577

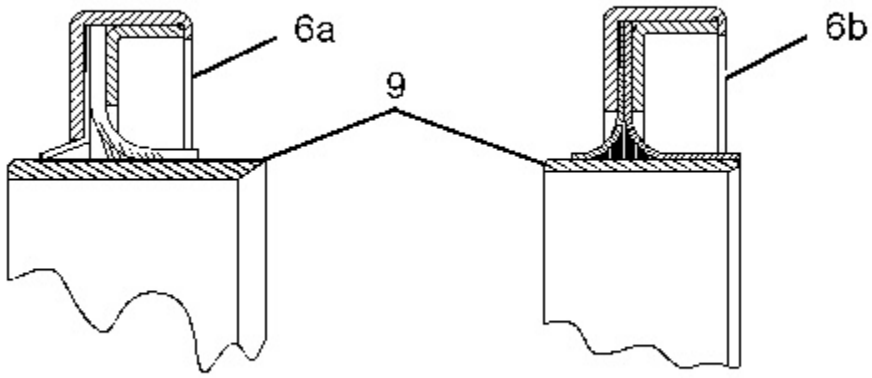


Illustration 4 g01526794

Use the correct type of seal for your application.

Note: The wear sleeve (9) must not be removed from the rear crankshaft seal at any time. If the wear sleeve is removed from the rear crankshaft seal, the rear crankshaft seal should not be used.

Product: WHEEL LOADER
Model: 950G II WHEEL LOADER BAA
Configuration: 950G II WHEEL LOADER BAA00001-UP (MACHINE) POWERED BY 3126B Engine

Disassembly and Assembly
3126B Engines for Caterpillar Built Machines
Media Number -SENR9581-05 **Publication Date -01/06/2016** **Date Updated -01/06/2016**

i01983695

Crankshaft Main Bearings - Remove

SMCS - 1203-011

Removal Procedure

Table 1

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
A	2P-5518	Main Bearing Tool	1

Start By:

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

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

Product: WHEEL LOADER
Model: 950G II WHEEL LOADER BAA
Configuration: 950G II WHEEL LOADER BAA00001-UP (MACHINE) POWERED BY 3126B Engine

Disassembly and Assembly
3126B Engines for Caterpillar Built Machines
Media Number -SENR9581-05 **Publication Date -01/06/2016** **Date Updated -01/06/2016**

i01929732

Crankshaft Wear Sleeve (Rear) - Install

SMCS - 1161-012-ZV

Installation Procedure

Table 1

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
C(1)	132-8772	Seal Locator	1
D(1)	1U-7596	Bolt	2
E(1)	1U-7597	Sleeve Ring	1
F(1)	1U-7594	Seal Installer	1
G(1)	9S-8858	Nut	1

(1) Part of the **1U-7598** Seal Installer

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

1. Ensure that the rear of the crankshaft is thoroughly clean and dry prior to the installation of the crankshaft rear seal.

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.

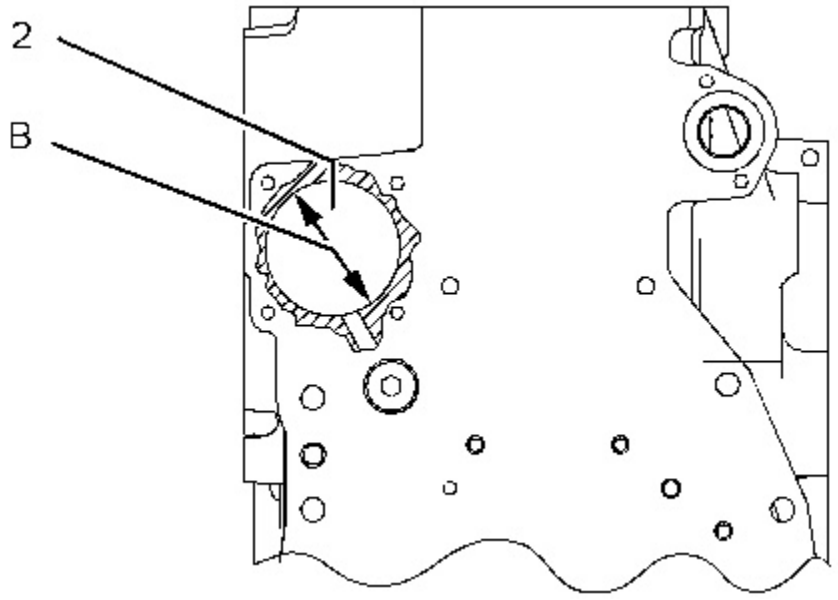


Illustration 2 g01387812

View A-A

(2) Location of the joint for the six camshaft bearings

(B) Bore diameters in the cylinder block for all camshaft bearings except the front bearing ... 69.000 ± 0.038 mm (2.7165 ± 0.0015 inch)

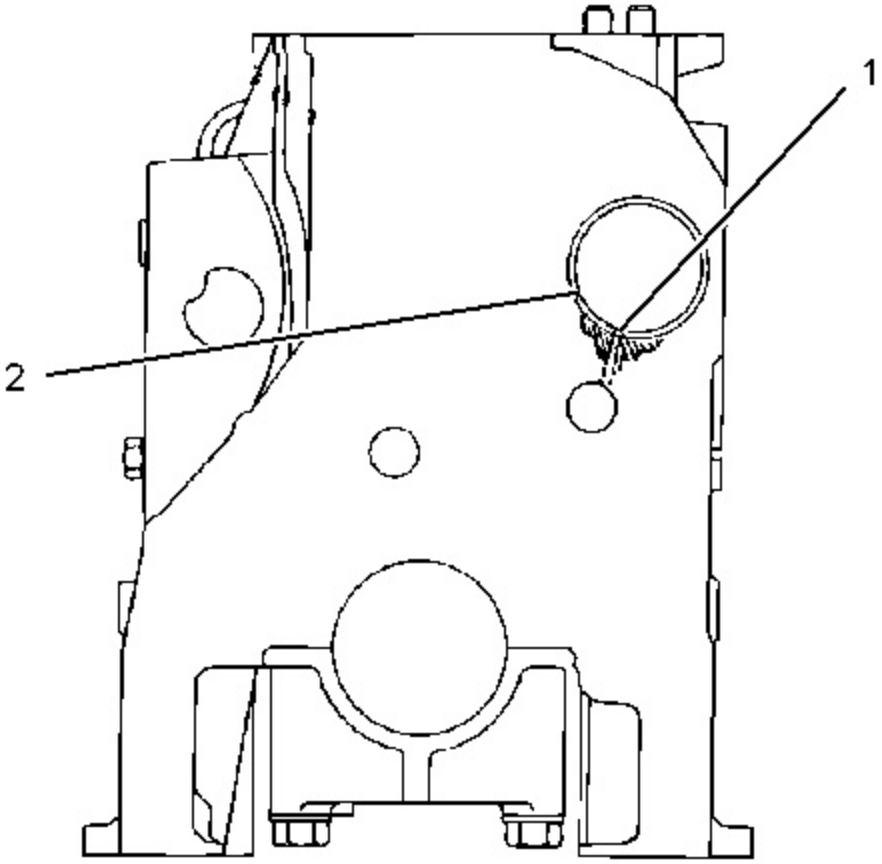


Illustration 2 g01104579

1. Use Tooling (A) to install all of the camshaft bearings except for the front bearing. Orient oil hole (1) in each bearing so that oil hole (1) is located at the top of the bore.

2. Use Tooling (A) to install the front camshaft bearing. Align oil hole (1) in the front camshaft bearing with the oil hole in the cylinder block. Locate joint (2) in the front camshaft bearing in the proper position.

End By:

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

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.

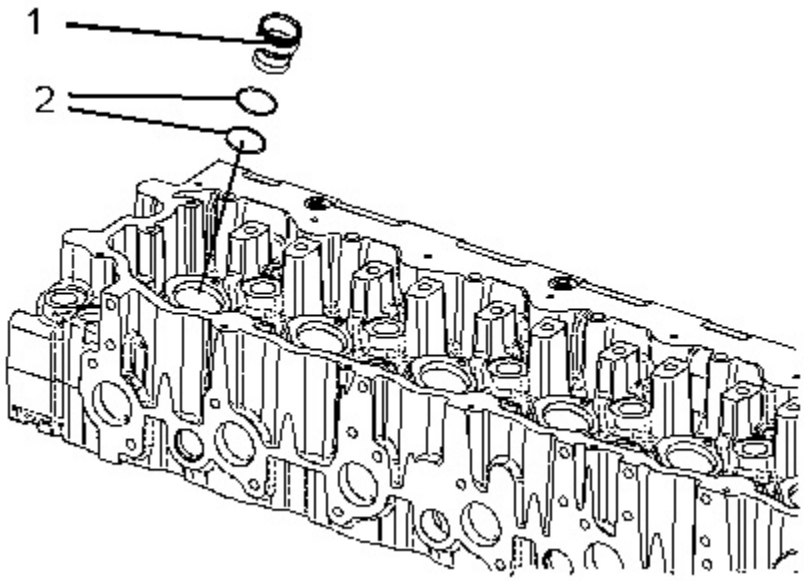


Illustration 1 g01025481

1. Install Tooling (A) into unit injector sleeve (1).
2. Use Tooling (A) in order to remove unit injector sleeve (1) from the cylinder head.
3. Remove O-ring seals (2) from unit injector sleeve (1).

Wed Dec 11 17:39:59 UTC+0400 2019

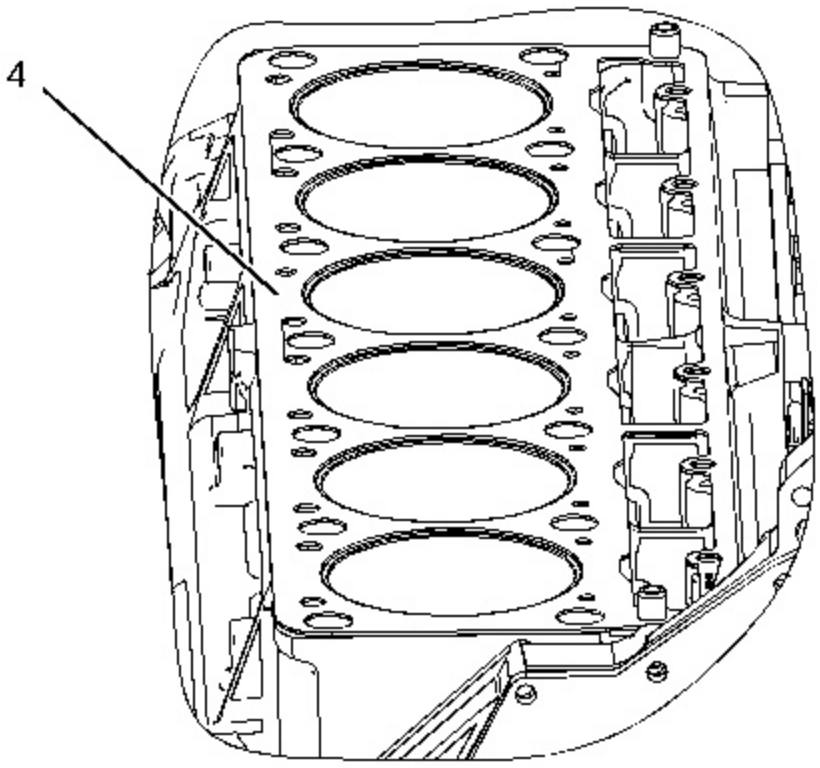


Illustration 2 g01027450

3. Remove cylinder head gasket (4).

Wed Dec 11 17:40:14 UTC+0400 2019

FINNING CAT

Service Information System

Shutdown SIS

Previous Screen

Product: WHEEL LOADER
Model: 950G II WHEEL LOADER BAA
Configuration: 950G II WHEEL LOADER BAA00001-UP (MACHINE) POWERED BY 3126B Engine

Specifications

3126B Engine for Caterpillar Built Machines

Media Number -SENR9579-05 **Publication Date -01/01/2005** **Date Updated -28/01/2005**

i03089705

Flywheel Housing

SMCS - 1157

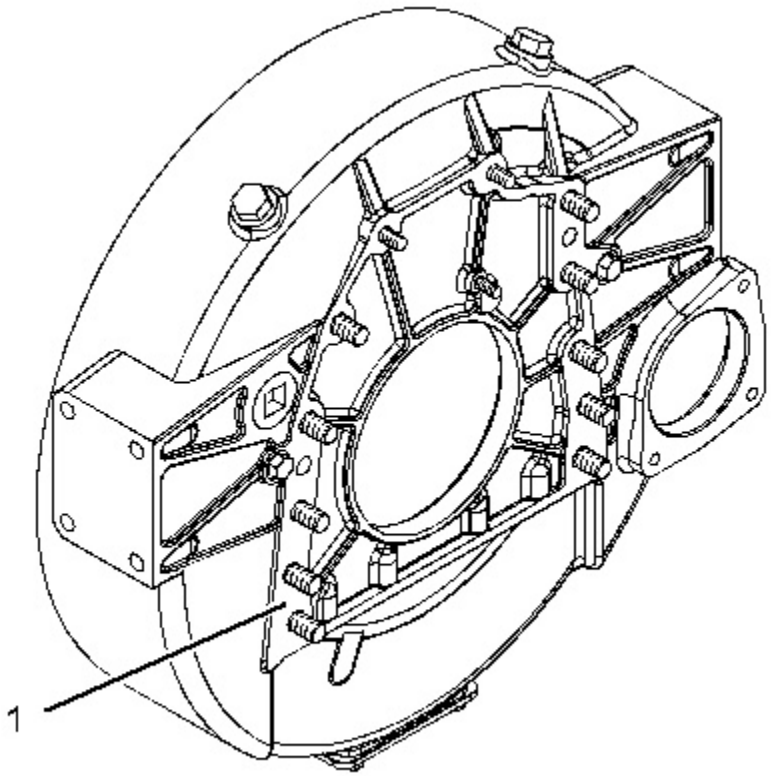


Illustration 1 g01231611

(1) Sealing surface

Product: WHEEL LOADER
Model: 950G II WHEEL LOADER BAA
Configuration: 950G II WHEEL LOADER BAA00001-UP (MACHINE) POWERED BY 3126B Engine

Disassembly and Assembly
3126B Engines for Caterpillar Built Machines
Media Number -SENR9581-05 **Publication Date -01/06/2016** **Date Updated -01/06/2016**

i02375078

Camshaft Idler Gear - Remove and Install

SMCS - 1206-010

Removal Procedure

Table 1

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
A	1P-0520	Driver Gp	1

Start By:

a. 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.

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

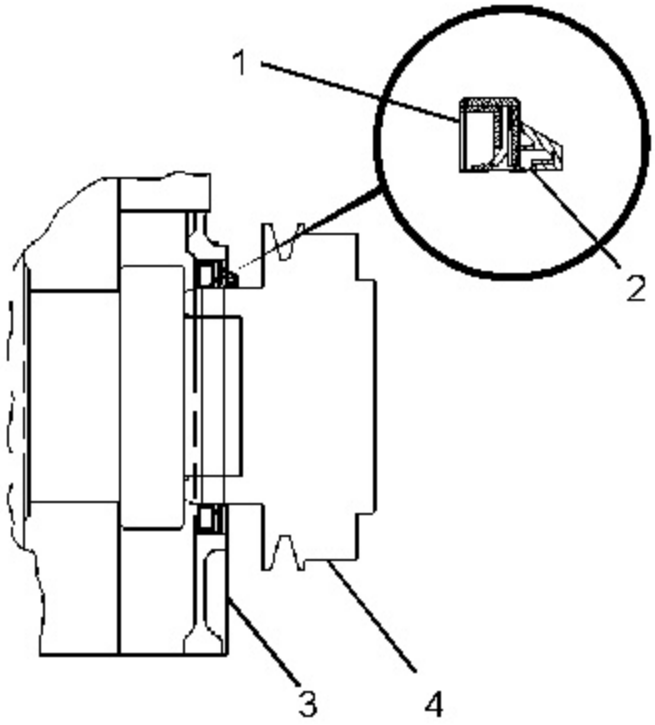


Illustration 1 g01355051

Note: The front crankshaft seal and the crankshaft seal excluder are serviced separately.

(1) Install the front crankshaft seal. Ensure that the front face of the crankshaft seal is 2.5 mm (0.10 inch) from the front housing (3).

(2) Before installing the crankshaft seal excluder onto the crankshaft, lubricate the inside diameter of the crankshaft seal excluder sparingly with liquid soap.

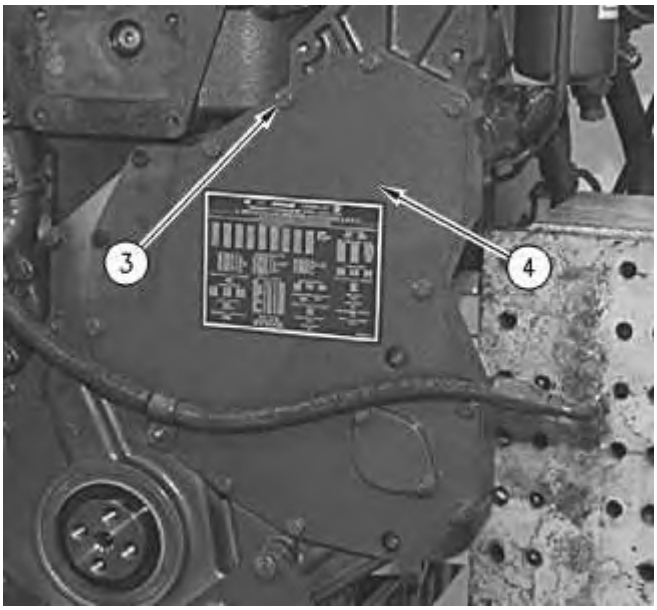


Illustration 1 g00728369

2. Install the housing cover gasket.
3. Position front cover (4) on the front housing. Install the bolts (3) on front cover (4).

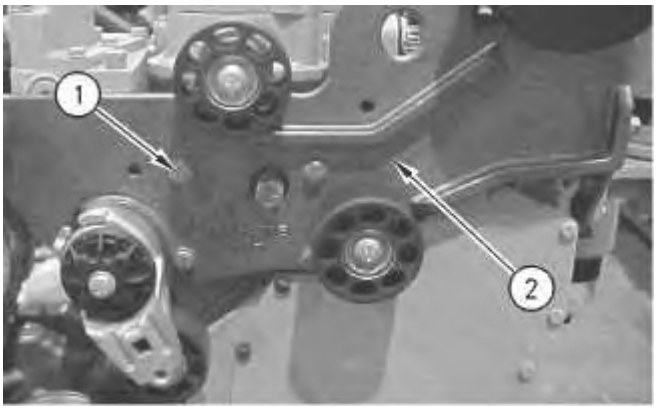


Illustration 2 g00728351

4. Position bracket (2) on the front of the engine.
5. Install four bolts (1) that fasten bracket (2) on the engine.

End By:

a. Install the alternator. Refer to Disassembly and Assembly, "Alternator - Remove and Install".

FINNING CAT

Service Information System

Shutdown SIS

Previous Screen

Product: WHEEL LOADER
Model: 950G II WHEEL LOADER BAA
Configuration: 950G II WHEEL LOADER BAA00001-UP (MACHINE) POWERED BY 3126B Engine

Specifications

3126B Engine for Caterpillar Built Machines

Media Number -SENR9579-05 **Publication Date -01/01/2005** **Date Updated -28/01/2005**

i03006262

Engine Oil Pan

SMCS - 1302

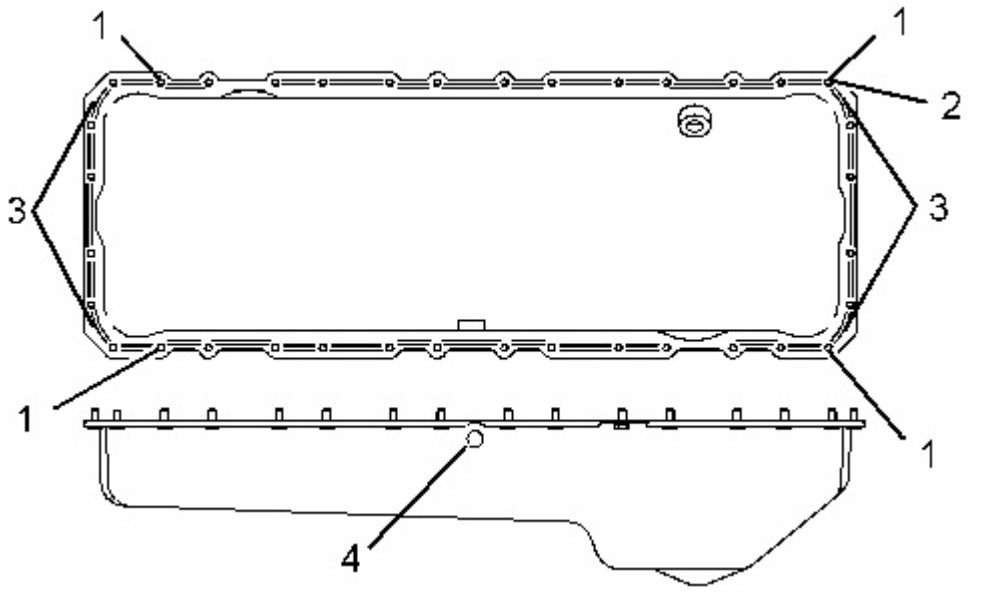


Illustration 1 g01522958

Note: The sealing surfaces of the oil pan shall be free of oil, debris, gasket material that is protruding, or any other sealant. The oil pan must be assembled and tightened to the cylinder block within ten minutes of applying sealant.

Use the following procedure in order to tighten the bolts for the oil pan.

1. Apply **4C-9612** Silicone Sealant to four areas on the sealing surface of the oil pan. The areas are marked location (3). The areas are at the corners of the oil pan in the following locations:
    - Connecting joint of the front housing and the front of the cylinder block

Note: The connecting rod small end must be heated or cooled to achieve a difference of 170° ± 260°C (338° ± 500°F) before the installation of the piston pin bearing.			
A	-	-	Bore in the connecting rod for the piston pin bearing is 43.191 ± 0.013 mm (1.7004 ± 0.0005 inch).
B	-	-	Bore in the piston pin bearing after installation of the bearing is 40.028 ± 0.008 mm (1.5759 ± 0.0003 inch).
C	-	-	The bearing joint for the piston pin bearing must be positioned to the following angle above the centerline on either side is 12.5 ± 5 degrees.
D	-	-	Distance for heating the connecting rod for the installation of the piston pin bearing is 75 ± 5 mm (3.0 ± 0.2 inch).
E	-	-	Distance between the center of the connecting rod bores is 200 mm (7.9 inch).
F	-	-	Bore in the connecting rod for the bearing for the crankshaft connecting rod journal is 75.000 ± 0.013 mm (2.9527 ± 0.0005 inch).
G	-	-	Length of the bolts is 68.5 ± 0.5 mm (2.70 ± 0.02 inch).

Note: Use the following procedure to tighten the connecting rod bolts before measuring the crankshaft bore. Check the dimensions of the crankshaft bore only after the tightening procedure has been followed.

1. Before installing the rod cap, clean the mating surfaces of the connecting rod with compressed air or a steel brush. Ensure that there are no loose particles that remain from the process that is used to fracture the rod.
2. Lubricate the seating faces of the rod cap bolts with **4C-5592** Anti-Seize Compound or clean engine oil before installing the bolts.
3. Install new bolt (1) and torque the bolts to 70 ± 5 N·m (50 ± 4 lb ft).
4. Place an index mark on each connecting rod cap bolt and tighten each of the cap bolts for an additional 120 ± 5 degrees (1/3 of a turn).

Wed Dec 11 17:42:18 UTC+0400 2019

Product: WHEEL LOADER
Model: 950G II WHEEL LOADER BAA
Configuration: 950G II WHEEL LOADER BAA00001-UP (MACHINE) POWERED BY 3126B Engine

Disassembly and Assembly
3126B Engines for Caterpillar Built Machines
Media Number -SENR9581-05 **Publication Date -01/06/2016** **Date Updated -01/06/2016**

i02372739

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.

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.

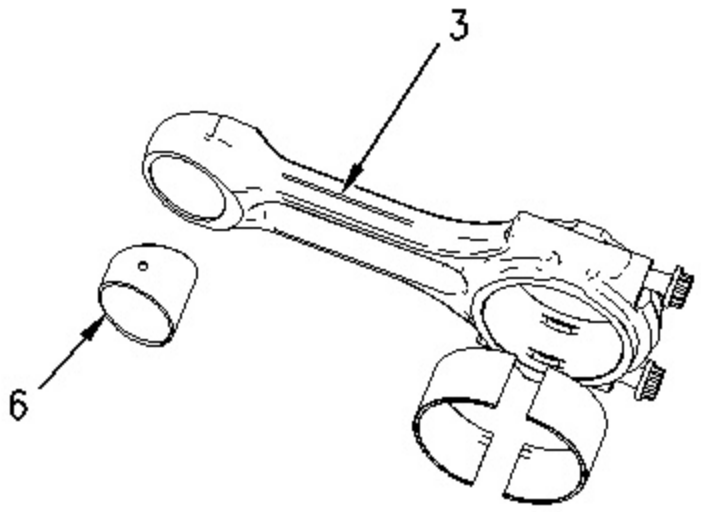
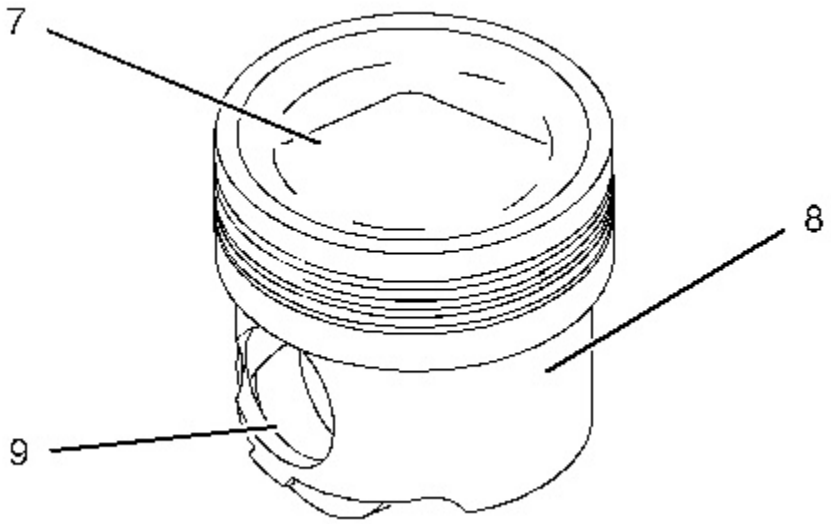


Illustration 2 g00988732

5. Replace rod bearing (6) by pressing a new bearing into the connecting rod. Refer to Special Instruction, SEHS7295 for the correct tooling and the correct installation procedure.



Maximum permissible face runout of the damper assembly at location (A) ... 0.00 to 2.03 mm (0.000 to 0.080 inch)

(2) Crankshaft pulley

(3) Bolts

Tighten the crankshaft pulley bolts to the following torque. ... 190 ± 30 N·m (140 ± 22 lb ft)

Wed Dec 11 17:43:32 UTC+0400 2019

Illustration 1 g01182877

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

Installation Procedure

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

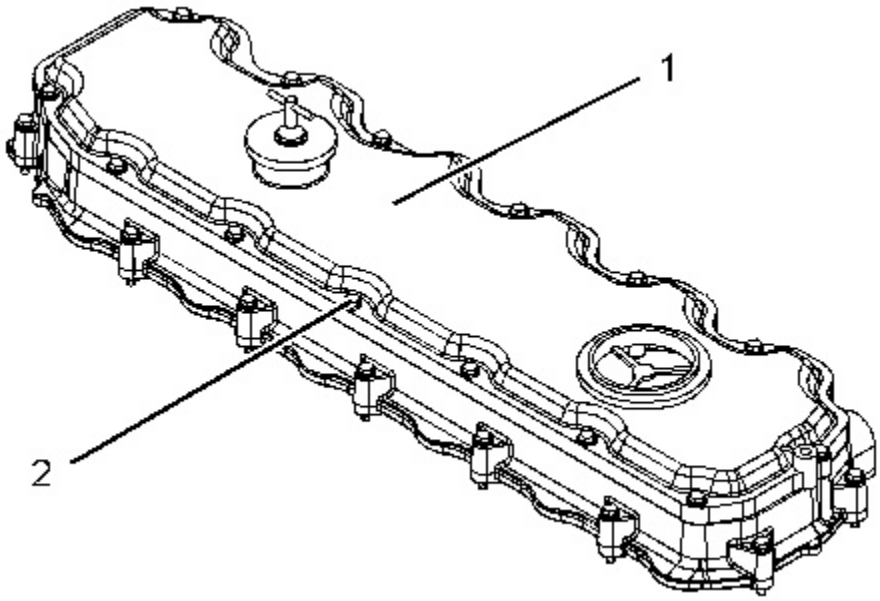


Illustration 2 g01182877

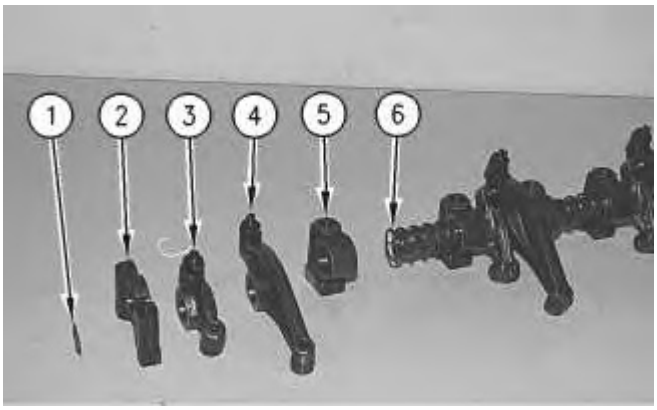


Illustration 1 g00611468

WARNING

Improper assembly of parts that are spring loaded can cause bodily injury.

To prevent possible injury, follow the established assembly procedure and wear protective equipment.

3. Install spring (6), stand (5), exhaust rocker arm (4), inlet rocker arm (3), and stand (2) on the rocker shaft.
4. Use Tooling (A) to install retaining ring (1).

End By:

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

All of the coolant passes through the core of the oil cooler and the coolant enters the internal water manifold of the cylinder block. The manifold disperses the coolant to water jackets around the cylinder walls.

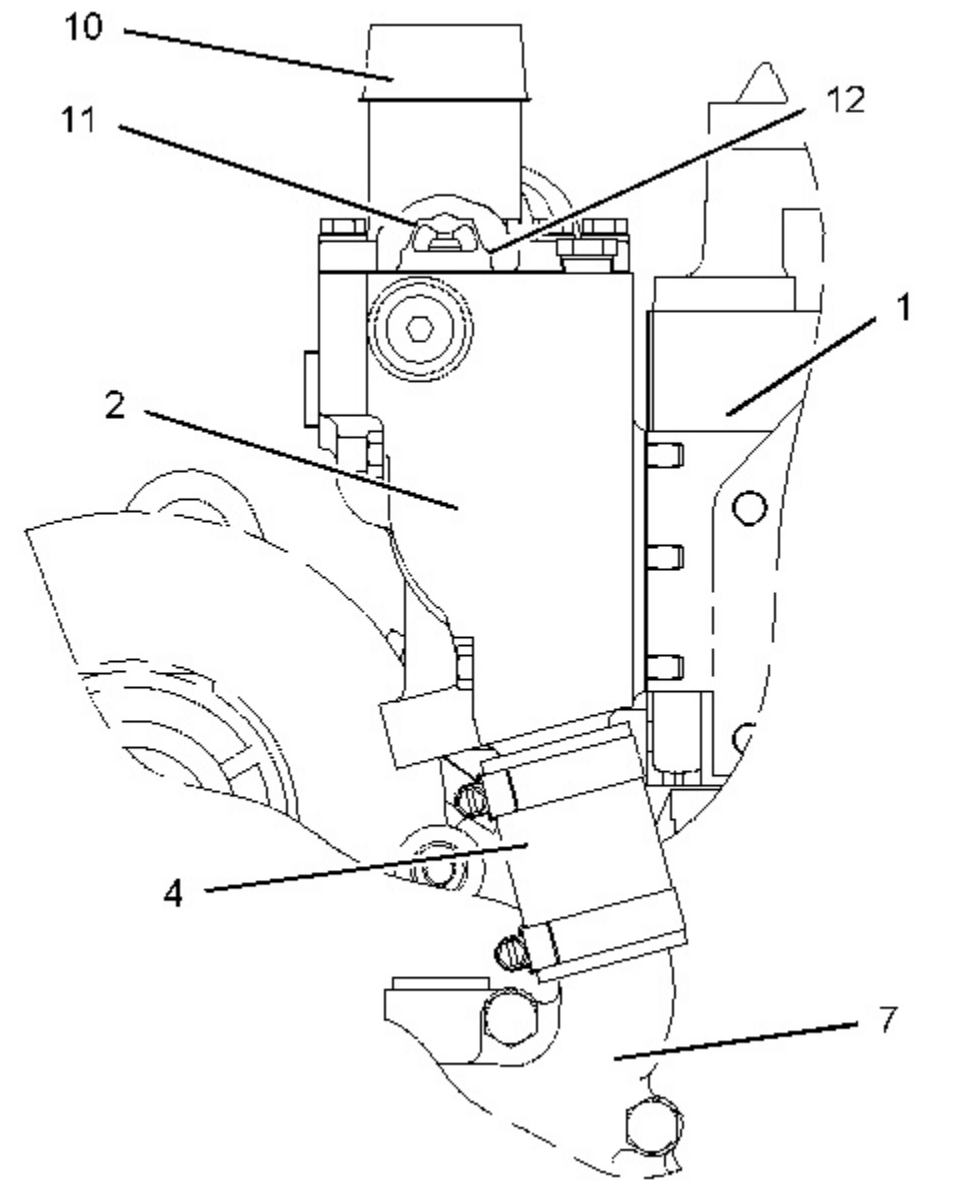


Illustration 2 g01139885

Water lines group

(1) Cylinder head

(2) Water temperature regulator housing

(4) Bypass hose

(7) Water pump

(13) Vibration mount
(14) Washer
(15) Nut
(16) Cable for remote calibrator
(17) Remote calibrator
(18) Pressure switch

The Mark III control system is controlled by software. The system allows upgrades to the software and customization by the user. The Mark III control system does not use a position sensor or an external AUTO-purge timer. These two features are built into the Mark III controller.

The following areas outline additional features that have been incorporated into the Mark III control system. These features are turned OFF at the factory. The features must be turned ON by the user.

Temperature Driven AUTO-Purge - This feature initiates a purge cycle when the temperature rises above the purge setpoint temperature. Temperature driven AUTO-purge is designed for applications that allow the radiator to become plugged in a short period of time. This feature protects against quick plugging of the radiator.

Purge Interval Override - This feature changes the purge interval for timed AUTO-purges. when the engine temperature is below the purge setpoint temperature, the override sets the time between purges to sixty minutes. When the engine temperature rises above the set point, the interval changes. Purges occur at the interval that is selected according to the purge interval switch. This feature is tailored for applications that occasionally require frequent purges. When the purge interval override is active, the engine temperature will stay below the purge setpoint when frequent purges are not required. When the engine temperature begins to rise, purges will occur as frequently as desired in order to keep the radiator clean. This interval can be as often as every five minutes.

AUTO-Purge Suspend - This feature temporarily suspends AUTO-purges until the control box receives a signal that allows AUTO-purges to occur. This is helpful in operations that require purges at particular times. An example of the AUTO-purge suspend feature is temporarily suspending automatic purges, until the machine is put into REVERSE.

Auxiliary Purge Input - The Mark III control system has an input that is used as an additional method for initiating a purge cycle. A switch can be connected to the auxiliary purge input in order to initiate a manual purge from a remote location.

Purge Warning Relay - The control system contains a relay for switching on a warning device when a purge is occurring. The warning device could be a horn or light.

Remote Calibration - This feature is used when the control box is not mounted near the fan. An optional remote calibrator can be used. This feature allows the user to set the actuator travel limits and temperature setpoints without any assistance.

Short-Circuit Protection on the Actuator Circuit - This feature automatically turns off the power to the actuator circuit when a short is detected. The controller will wait for a few seconds before trying to resume normal operation. If the short is detected again, the control system will try to put the fan into full pitch. Every LED in the control box except the "T2" LED will blink rapidly and every LED except the "PUSH" LED on the remote display will be flashing in order to indicate that a problem exists. Refer to Service Manual, "Troubleshooting - Control System" for more information.

exists. When the switch opens, the fan will default to full pitch. This is used for a/c condenser cores that are cooled by the radiator fan. The core may need cooling, even when the engine is cold. A pressure switch that is normally closed monitors the pressure of the condenser core. When the pressure gets too high, the switch opens. This forces the fan into full pitch. When the pressure drops, the switch closes and normal temperature control resumes. Refer to Illustration 6 for details on the wiring.

Condition (C) - Understand the pitch control formula. The size of the increase in pitch is proportional to the largest temperature difference between the temperature of the sensors and the corresponding set points. Conversely, the size of the decrease in pitch is proportional to the smallest temperature difference between the temperature of the sensors and the corresponding set points.

Condition D. - There is no temperature sensor. The Mark III controller can operate without a temperature sensor. The fan will operate in full pitch. The temperature setpoints are ignored. The features that rely on temperature will not work without a temperature sensor.

The fan never operates in NEUTRAL pitch without a temperature sensor. If overcooling is a problem, a temperature sensor is required.

ECM Controlled System Operation

General Information

In the ECM Controlled System, the operation of the fan is controlled by the engine control module (ECM). The ECM receives signals from temperature sensors that monitor the temperature of the engine, and the manual purge switch. A counter inside the ECM acts as a timer to signal the fan at preset intervals. The ECM uses the signals to control a solenoid valve that directs the flow of hydraulic oil to the hydraulic connectors on the fan hub assembly. The pressure from the hydraulic oil allows the fan to change the pitch of the blades. The control systems that are controlled by the ECM do not use a position sensor or an external AUTO-purge timer.

The counter in the ECM allows the fan to automatically purge the radiator without input from the operator. The operator can also perform manual purges by depressing the purge button on the dash.

The following items are features that are included with a hydraulic actuated fan that is controlled by the ECM. The features may be activated or deactivated by your Caterpillar dealer. See Table 10 for the factory default settings.

Manual Purge Switch - When this feature is enabled, this feature allows manual purges to be performed by depressing the manual purge switch. The switch sends a signal to the ECM in order for the ECM to initiate a purge cycle.

Purge Suspend - When this feature is activated, this feature temporarily suspends automatic purges until the ECM receives a signal that allows the automatic purges to occur. This is helpful in operations

Product: WHEEL LOADER
Model: 950G II WHEEL LOADER BAA
Configuration: 950G II WHEEL LOADER BAA00001-UP (MACHINE) POWERED BY 3126B Engine

Systems Operation
Flexxaire Fan
Media Number -RENR3699-07 **Publication Date -01/02/2012** **Date Updated -21/06/2016**

i01742841

Hydraulic Actuated Fan System

SMCS - 1356-HFN

General Information

The fan system is composed of two groups. The groups are the hub assembly with blades and the control system.

System Operation

Use the following illustration for terminology and component identification. The appearance of your fan may vary.

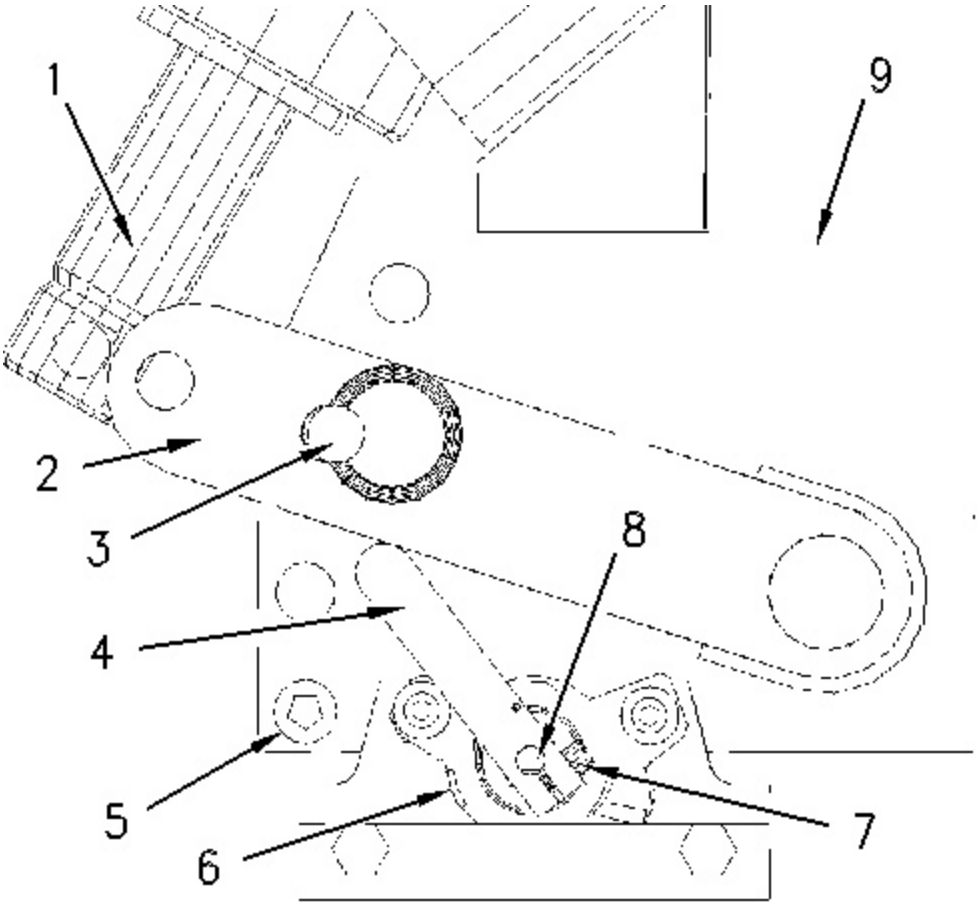


Illustration 1 g00587421

(1) Actuator
(2) Operator fork
(3) Hitch pin
(4) Position sensor lever
(5) Mechanical stop
(6) Position sensor
(7) Screw
(8) Position sensor shaft
(9) Alignment plate

1. Unplug actuator (1). Remove the pin from actuator (1). Power should remain connected to the rest of the system.

2. Manually move operator fork (2) to the NEUTRAL position. Pin operator fork (2) in position with hitch pin (3).

3. Loosen screw (7) on position sensor lever (4) in order to allow rotation of position sensor shaft (8) with a screwdriver.

Note: If your system is not equipped with plug (1), remove brown wire from temperature sensor (2) in the engine block or ground temperature sensor (3) to the engine block. This will initiate movement of the actuator. Put brown wire (2) back on temperature sensor (3), or stop grounding temperature sensor (3) in order to move the blades back to NEUTRAL.

L3 (green light) inside the control box will be on. The actuator will move and one of the two following cases will occur.

a. Case 1. The actuator makes a ratcheting sound. The actuator moves too far and the actuator contacts the mechanical stop.

   - Reconnect the plug with two pins in order to move the fan blades to the NEUTRAL position. The actuator will stop ratcheting.
   - Rotate adjustment screw (P103) near L3 in order to decrease the amount of actuator travel. Rotate the screw counterclockwise by approximately one turn.
   - Disconnect the plug with two pins in order to move the blades to full pitch.
   - Check the actuator position.
   - Repeat the four previous steps until the actuator stops ratcheting due to contact with the mechanical stop.
   - Connect the plug with two pins. The fan blades will return to the NEUTRAL position.
   - Alternately connect and disconnect the plug with two pins in the temperature sensor circuit. Rotate adjustment screw (P103) near L3, clockwise until the operator fork stops approximately 3.0 mm (0.12 inch) from the mechanical stop.
   - Proceed to Step 4.

b. Case 2. The actuator stops short of the mechanical stop. No contact is made between the actuator and the mechanical stop.

   - Reconnect the plug with two pins in order to move the fan blades to the NEUTRAL position.
   - Rotate adjustment screw (P103) near L3 in order to increase the amount of actuator travel. Rotate the screw clockwise by approximately one turn.
   - Disconnect the plug with two pins in order to move the blades to full pitch.
   - Check the actuator position.
   - Repeat the four previous steps until the operator fork stops approximately 3.0 mm (0.12 inch) from the mechanical stop.
   - Connect the plug with two pins in order to move the fan blades to the NEUTRAL position.
   - Proceed to Step 4.

9. Check the filler cap. A pressure drop in the radiator can cause the boiling point to be lower. This can cause the cooling system to boil. Refer to Testing and Adjusting, "Cooling System - Test".

10. Check the fan and/or the fan shroud.

    a. Ensure that the fan is installed correctly. Improper installation of the fan can cause engine overheating.

    b. The fan must be large enough to send air through most of the area of the radiator core. Ensure that the size of the fan and the position of the fan are according to the OEM specifications.

    c. The fan shroud and the radiator baffling must be the proper size. The fan shroud and the radiator baffling must be positioned correctly. The size of the fan shroud and the position of the fan shroud should meet the OEM specifications. The size of the radiator baffling and the position of the radiator baffling should meet the OEM specifications.

11. Check for loose drive belts.

    a. A loose fan drive belt will cause a reduction in the air flow across the radiator. Check the fan drive belt for proper belt tension. Adjust the tension of the fan drive belt, if necessary. Refer to Operation and Maintenance Manual, "Belt - Inspect/Adjust/Replace".

    b. A loose water pump drive belt will cause a reduction in coolant flow through the radiator. Check the water pump drive belt for proper belt tension. Adjust the tension of the water pump drive belt, if necessary. Refer to Operation and Maintenance Manual, "Belt - Inspect/Adjust/Replace".

12. Check the cooling system hoses and clamps. Damaged hoses with leaks can normally be seen. Hoses that have no visual leaks can soften during operation. The soft areas of the hose can become kinked or crushed during operation. These areas of the hose can cause a restriction in the coolant flow. Hoses can become soft. Also, hoses can get cracks after a period of time. The inside of a hose can deteriorate, and the loose particles of the hose can cause a restriction of the coolant flow. Refer to Operation and Maintenance Manual.

13. Check for a restriction in the air inlet system. A restriction of the air that is coming into the engine can cause high cylinder temperatures. High cylinder temperatures can cause higher than normal temperatures in the cooling system. Refer to Testing and Adjusting, "Air Inlet and Exhaust System - Inspect".

    a. If the measured restriction is higher than the maximum permissible restriction, remove the foreign material from the engine air cleaner element or install a new engine air cleaner element. Refer to Operation and Maintenance Manual for more information on cleaning and replacing the air cleaner element.

    b. Check the air inlet system for a restriction again.

    c. If the measured restriction is still higher than the maximum permissible restriction, check the air inlet piping for a restriction.

3. Install the **9S-8140** Pressurizing Pump onto the radiator.
4. Take the pressure reading on the gauge to 20 kPa (3 psi) more than the pressure on the filler cap.
5. Check the radiator for leakage on the outside.
6. Check all connection points for leakage, and check the hoses for leakage.

The cooling system does not have leakage only if the following conditions exist:

- You do not observe any outside leakage.
- The reading remains steady after 5 minutes.

The inside of the cooling system has leakage only if the following conditions exist:

- The reading on the gauge goes down.
- You do not observe any outside leakage.

Note: Refer to Troubleshooting, "Coolant Level is Low" for additional information.

Make any repairs, as required.

Test For The Water Temperature Gauge

Table 4

Tools Needed		
Part Number	**Part Name**	**Quantity**
348-5430	Multi-Tool Gp	1

WARNING

Personal injury can result from escaping fluid under pressure.

If a pressure indication is shown on the indicator, push the release valve in order to relieve pressure before removing any hose from the radiator.

WARNING

Product: WHEEL LOADER
Model: 950G II WHEEL LOADER BAA
Configuration: 950G II WHEEL LOADER BAA00001-UP (MACHINE) POWERED BY 3126B Engine

Troubleshooting
3126B Engines for the IT62G Series II Integrated Toolcarrier and for the 950G Series II and 962G Series II Wheel Loaders
Media Number -SENR9617-05 **Publication Date -01/07/2010** **Date Updated -28/07/2010**

i05451344

Coolant Temperature Is Too High

SMCS - 1395-035

Probable Causes

- Low coolant level
- Air in coolant
- Water pump
- Environmental conditions
- Shunt line restriction
- Radiator or heat exchanger
- Water temperature regulator
- Coolant temperature sensor
- Engine coolant flow
- Exhaust restriction
- Excessive load
- Combustion gas in the coolant

Recommended Repairs

The next likely cause is combustion gas leakage into the cooling system. Combustion gas can be introduced into the cooling system through damaged liner seals, cracks in the liners, a damaged cylinder head, or a damaged cylinder head gasket.

d. Check the cooling system hoses and clamps for damage.

   Clamps that are damaged and hoses that are leaking can usually be discovered during a visual inspection.

   Hoses that have no visual leaks can soften during operation. The soft areas of the hose can kink or the soft areas of the hose may collapse during operation. This can restrict the coolant flow. This can cause the engine to overheat. Check the hoses for soft spots.

   Internal cracks can also develop in cooling system hoses. This type of deterioration usually produces particles that can build up in the cooling system. This may cause a restriction in the coolant flow through components. Check the hoses for spots that are hard or brittle.

e. Check the water pump. Remove the water pump and check for damage to the impeller. A water pump with a damaged impeller will not pump an adequate amount of coolant through the system.

f. Check the operation of the water temperature regulator. A water temperature regulator that does not open, or a water temperature regulator that only opens part of the way can cause overheating.

g. If the cooling system for this application is equipped with an expansion tank, check the shunt line for the expansion tank.

   The shunt line must be submerged in the expansion tank. If the shunt line is not submerged, air will be introduced into the cooling system.

   Check the shunt line for a restriction. A restriction of the shunt line from the expansion tank to the inlet of the water pump will cause a reduction in water pump efficiency. A reduction in water pump efficiency will result in low coolant flow.

B. High air inlet temperatures can cause high cooling system temperatures. Check for a problem in the engine's air inlet and exhaust systems.

   a. Check for a restriction in the air inlet system. A restriction of the air that is coming into the engine can cause high cylinder temperatures. High cylinder temperatures cause higher than normal temperatures in the cooling system.

   b. Check for a restriction in the exhaust system. A restriction of the air that is coming out of the engine can cause high cylinder temperatures.

   c. If the air inlet system for this application is equipped with an aftercooler, check the aftercooler. A restriction of air flow through the air to air aftercooler can cause overheating. Check for debris or deposits which would prevent the free flow of air through the aftercooler.

approximate resistance measurement. If the measurements do not fall within this range, replace the position sensor.

Mark III Control System Troubleshooting

Troubleshooting (Fault codes not present)

Problem 1: No lights on the control box or remote display come ON during system start-up The actuator does not move.

Cause 1: There is a faulty connection of the power wire.

Solution 1: Check the connection of the power wire and inspect the wire for damage. Perform a continuity check of the wire. If there is no continuity, replace the wire. If there is continuity, check terminal 1 on the lower terminal block for +12/24 V. Check terminal 8 on the lower terminal block for 0 V.

Note: The actuator will operate on a 12 V system. If the voltage reading is less than 12 V, check the power source. If the power source is applying the appropriate voltage, replace the control box.

Cause 2: The main fuse is blown.

Solution 2: Check the power connections for the correct polarity. Replace the 15 Amp fuse. If a new fuse does not solve the problem, replace the control box.

Cause 3: The surge suppressor is blown. If the voltage spike is greater than 39 V, the surge suppressor will burn out.

Solution 3: Replace the surge suppressor. Locate the source of the voltage spikes. Damage to the control box may result if the surge suppressor is not replaced.

Cause 4: The control box is faulty.

Solution 4: Replace the control box if the other solutions are not effective.

Problem 2: The lights on the control box and remote display are ON, but the actuator does not respond.

Cause 1: The actuator is faulty.

Solution 1: Disconnect the actuator from the pigtail. Verify that the actuator is functioning by applying power directly to the actuator. Apply 24 V to pin A or pin B on the actuator plug. Pin C is the ground for the shielded cable. The actuator should extend or the actuator should retract. When you reverse polarity, the opposite effect should take place. If the actuator does not respond satisfactorily, replace the actuator.

Cause 2: The power connection to the control box is faulty.

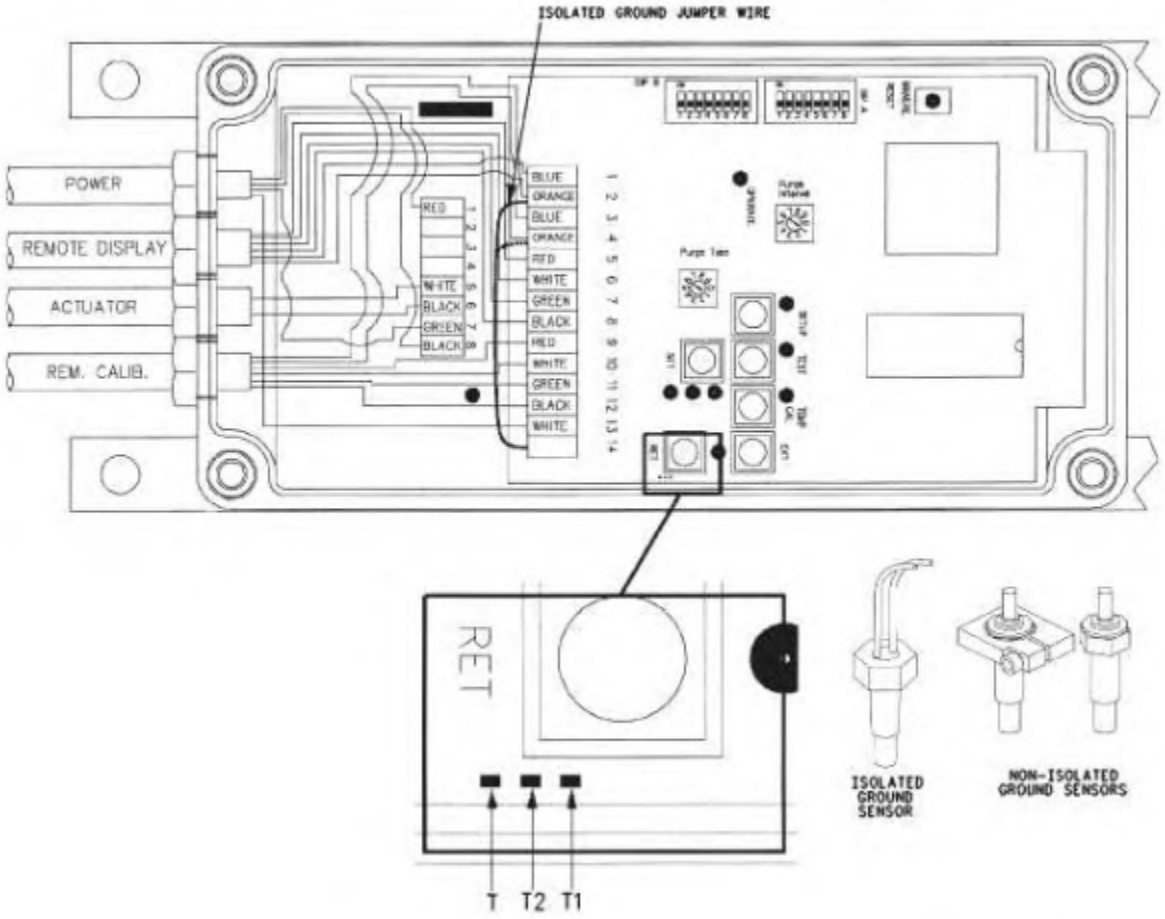


Illustration 8 g00930192

The Mark III control system uses a temperature sensor to determine the temperature of the engine. If the control box is not responding correctly to the engine temperature, one of the following problems may exist:

- The temperature sensor is faulty.
- The wiring is faulty between the temperature sensor and the controller.
- A difference in the ground of the engine block and the ground of the controller can cause faulty readings. If the Flexxaire Isolated Ground Sensor is used, then a difference in the ground will not affect the reading.
- The controller is faulty. The controller has an adjustable temperature setpoint. Before proceeding, ensure that the observed problem is not an incorrect temperature setting. Refer to “Temperature Setpoint Calibration”.

The following test procedure will isolate the problem. The test should be run while the control system is malfunctioning and the engine is hot and running.

1. Test the Temperature Sensor.

    a. Disconnect the wires from the temperature sensor at the engine block.

Product: WHEEL LOADER
Model: 950G II WHEEL LOADER BAA
Configuration: 950G II WHEEL LOADER BAA00001-UP (MACHINE) POWERED BY 3126B Engine

Disassembly and Assembly
Flexxaire Fan
Media Number -RENR3699-07 **Publication Date -01/02/2012** **Date Updated -21/06/2016**

i01797691

Torque Specifications (Flexxaire Fan)

SMCS - 1359-779

General Information on Torques

Exceptions to these torques are given in the Service Manual, if necessary.

Prior to installation of any hardware, ensure that components are in near new condition. Bolts and threads must not be worn or damaged. Threads must not have burrs or nicks. Hardware must be free of rust and corrosion. Clean the hardware with a noncorrosive cleaner. Do not lubricate the fastener threads except for the rust preventive. The rust preventive should be applied by the supplier of that component for purposes of shipping and storage. Other applications for lubricating components may also be specified in the Service Manual.

When you are tightening a fastener, a certified torque wrench must be used at all times. Two torque values exist in the tables that follow. The “Dry” values are for fasteners without adhesive. The “Wet” values are for fasteners with adhesive.

Torques for Metric Fasteners

Table 1

Metric Nuts and Bolts				
Thread Size Metric	Torque			
	Grade 10.9		Grade 8.8	
	Dry	Wet	Dry	Wet
M6	14 N·m (10 lb ft)	10 N·m (7.5 lb ft)	-	-
M8	34 N·m (25 lb ft)	26 N·m (19 lb ft)	23 N·m (17 lb ft)	18 N·m (13 lb ft)

Illustration 2 g00841103

6. Remove engine oil cooler (5) and the gasket.

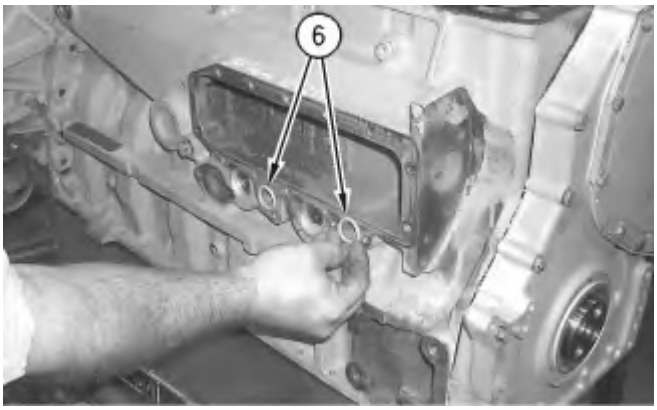


Illustration 3 g00841125

7. Remove the two O-ring seals (6) .

Wed Dec 11 18:19:31 UTC+0400 2019

Illustration 3 g00843821

5. Loosen clamps (4) and remove tube assembly (5) .

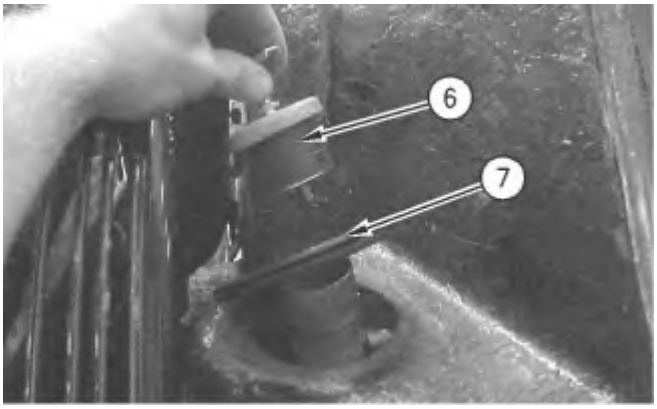


Illustration 4 g00843823

6. Remove oil fill cap (6) and grommet (7), as shown.

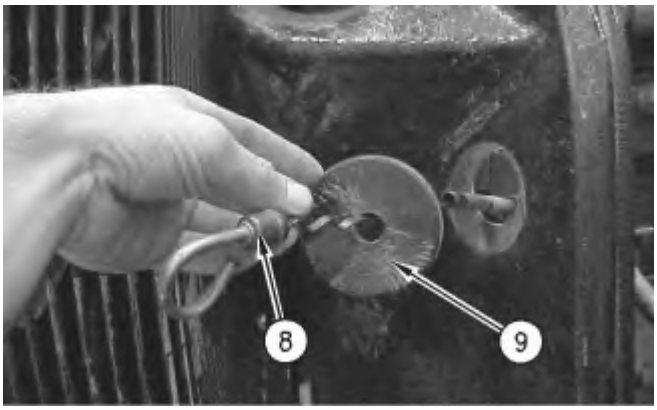


Illustration 5 g00843827

7. Remove oil level indicator (8) and grommet (9), as shown.

Illustration 6 g00844090

9. Connect harness assembly (23) .

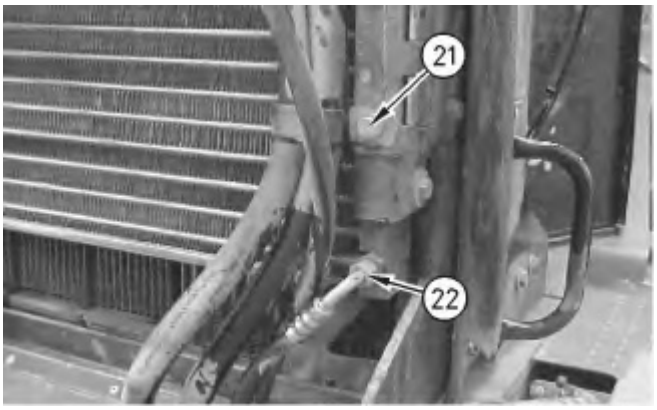


Illustration 7 g00844088

10. Connect hose assembly (22) .
11. Install bolt (21), the washer, and the clip.

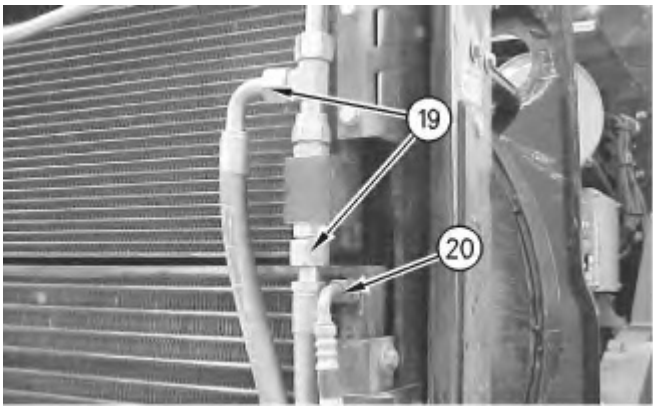


Illustration 8 g00844086

12. Connect hose assembly (20) .
13. Connect hose assemblies (19) .

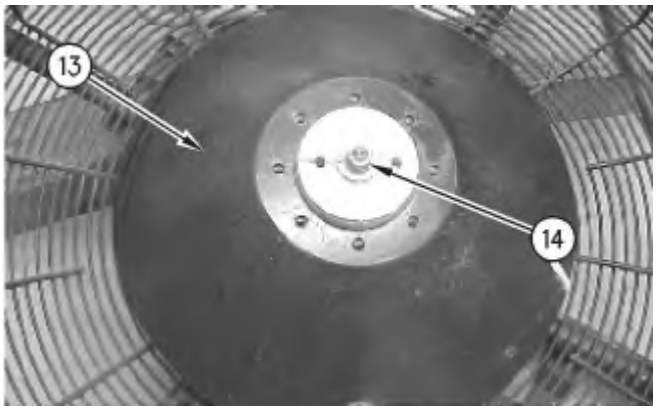


Illustration 10 g00845845

16. Remove deflector (13) .
17. Remove nut (14) and the washer.

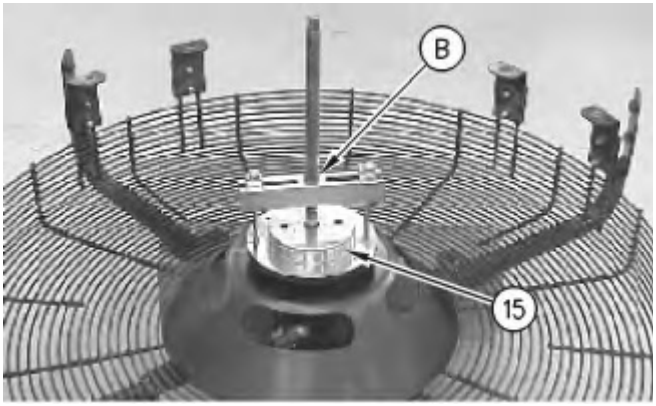


Illustration 11 g00845866

18. Install Tooling (B), as shown.
19. Use Tooling (B) in order to remove adapter (15) .

FINNING CAT

Service Information System

Shutdown SIS

Previous Screen

Product: WHEEL LOADER
Model: 950G II WHEEL LOADER BAA
Configuration: 950G II WHEEL LOADER BAA00001-UP (MACHINE) POWERED BY 3126B Engine

Disassembly and Assembly
Flexxaire Fan
Media Number -RENR3699-07 **Publication Date -01/02/2012** **Date Updated -21/06/2016**

i01739978

Control System - Remove and Install

SMCS - 1356-010-YC

General Installation

Installation of the Mark I Control System

Illustration 1 g00592772

1. Remove blades (1) from the fan assembly.
2. Mount the fan assembly to a stand, if a stand is available.

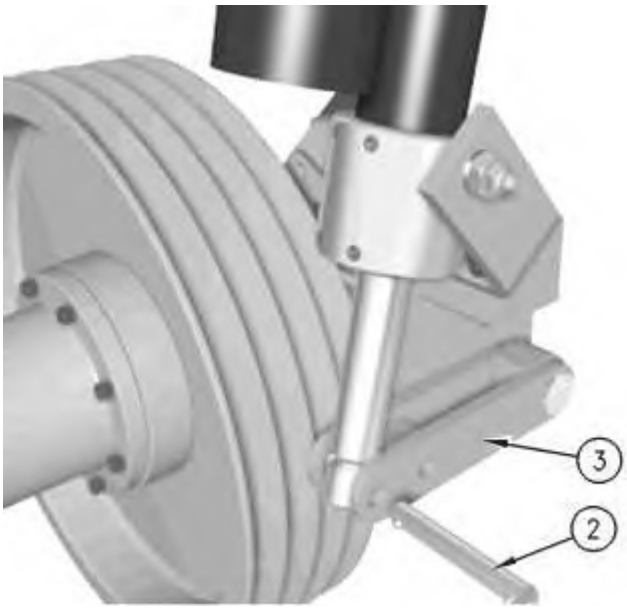


Illustration 2 g00592773

3. Remove hitch pin (2) from operator fork (3).

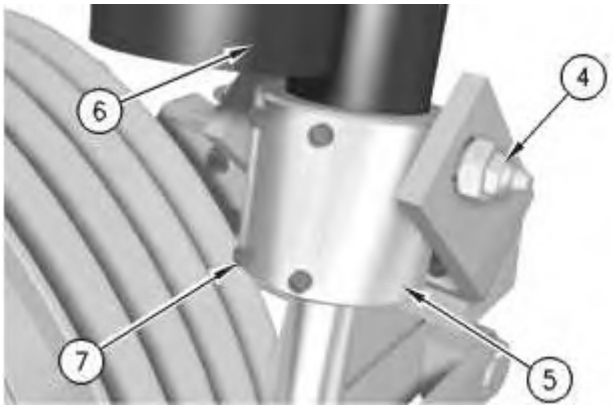


Illustration 3 g00592774

4. Loosen four setscrews (7) and remove actuator (6) from actuator collar (5). If you are unable to loosen setscrews (7), remove shoulder bolts (4) from actuator collar (5).

Illustration 25 g00593205

2. Use a puller in order to remove the remainder of shifter block assembly (3).

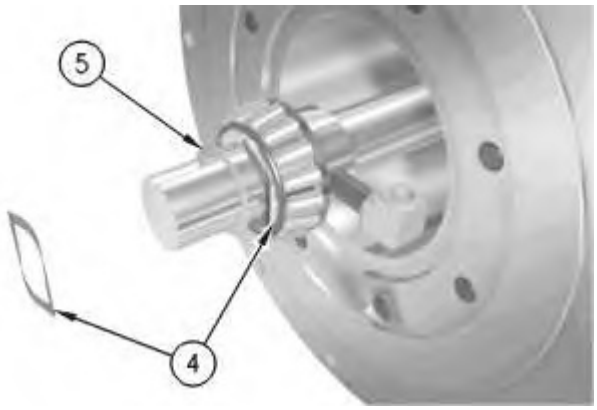


Illustration 26 g00593207

3. Remove two wave washers (4) and flat washer (5). Flat washer (5) is between the wave washers.

Illustration 27 g00593208

4. Remove O-Rings (6) from the hub inserts.

   Note: Carefully remove O-Rings (6) so that damage to the O-Ring grooves does not occur.

5. Inspect the O-Ring grooves for pitting, rust or other surface defects that may cause leakage.

Actuator Spherical Bearings and Control Shaft Bushings – Remove

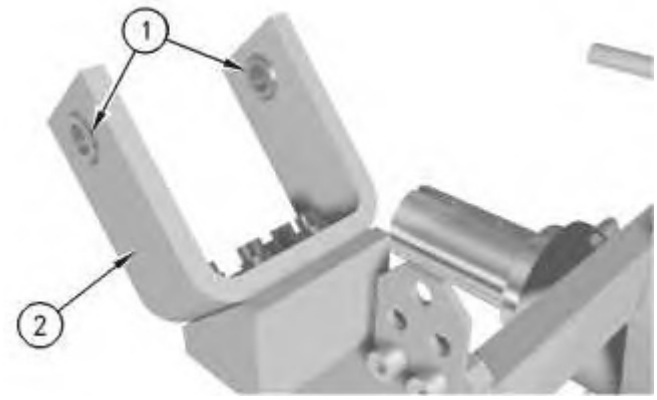


Illustration 52 g00597192

1. Remove spherical bearings (1) from actuator clevis (2).

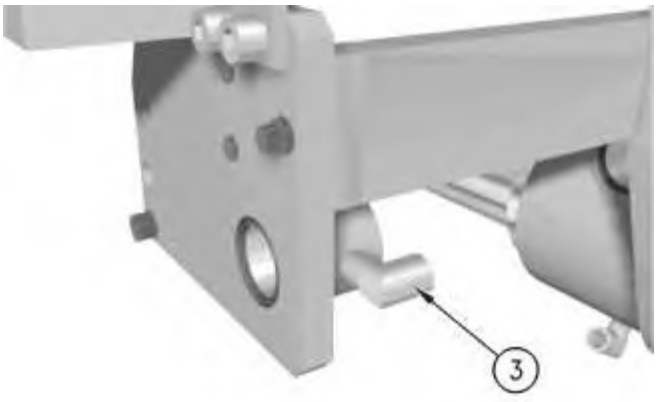


Illustration 53 g00597196

2. Remove grease fittings (3) from the control shaft bushing blocks.

Illustration 20 g00597530

19. Flip the hub assembly. Clean the groove in the hub that holds the O-Ring for the flange plate. Install O-Ring (17) into the groove.

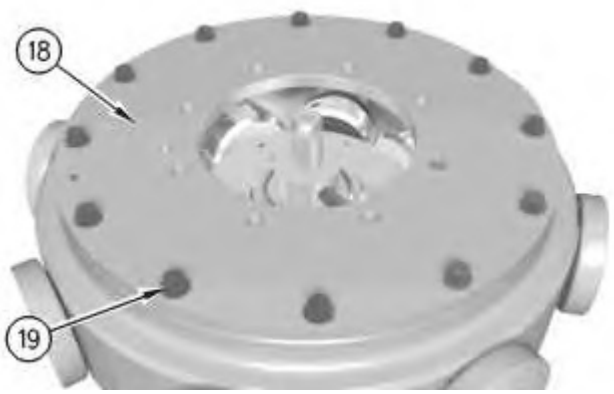


Illustration 21 g00597531

20. Place hub flange (18) onto the hub and align the holes.

    Note: There is a small capscrew in the flange plate that aligns with a counterbore in the hub.

21. Install capscrews (19). Do not put any **9S-3263** Thread Lock Compound on capscrews (19). Tighten capscrews (19) to a torque of 54 ± 5 N·m (40 ± 4 lb ft).

Actuator Bearings and Control Shaft Bushings – Install

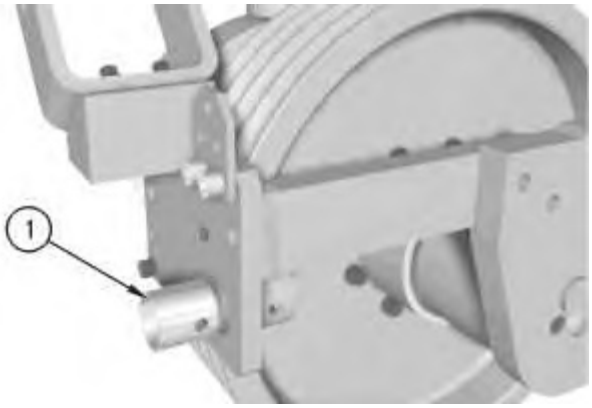


Illustration 22 g00597972

1. Apply **4C-9507** Retaining Compound to bushing (1) and install bushing (1). The hole in bushing (1) must line up with the hole in the bushing bore.

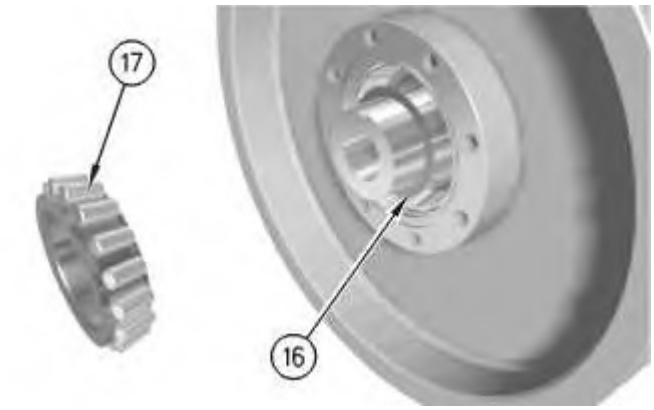


Illustration 44 g00598569

17. Install remaining shims (16) and bearing cone (17).

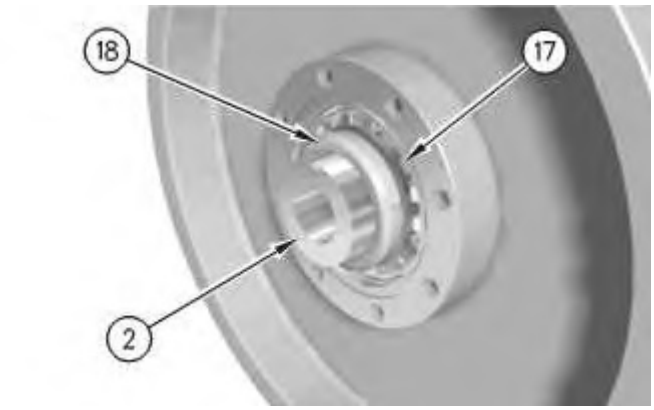


Illustration 45 g00598568

18. Thread bearing locknut (18) onto main shaft (2) so that the end with the bevel faces away from bearing cone (17). Tighten bearing locknut (18) to the correct torque. Refer to Table 3 for the correct torque.

Note: The use of a torque multiplier is recommended when you tighten bearing locknut (18).

Table 3

Torque Values for Bearing Locknut (18)		
Identification	Inside Diameter	Torque Value
N09	44.45 mm (1.75 inch)	230 ± 41 N·m (170 ± 30 lb ft)
N14	69.85 mm (2.75 inch)	353 ± 54 N·m (260 ± 40 lb ft)

8. Refer to Disassembly and Assembly, "Fan - Remove and Install" for your machine for the procedure to install the fan.

9. Install the fan drive belts. Do not tighten the belts at this time.

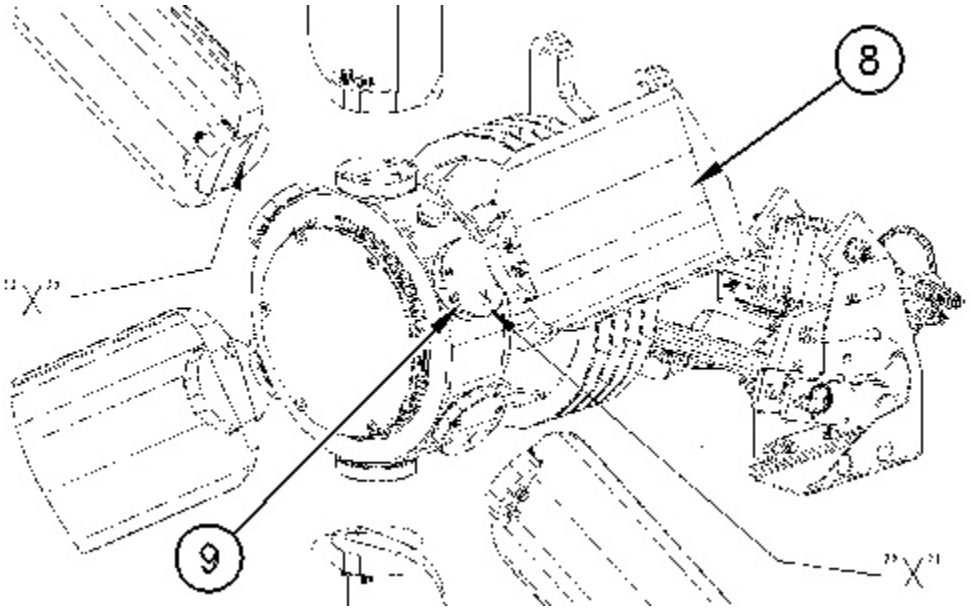


Illustration 67 g00607906

10. Install fan blades (8) so that the “X” on the bottom of the blade is matching the “X” on the surface of blade mounting shafts (9).

11. Secure fan blades (8) with the capscrews that have already been coated with thread lock compound. Tighten the capscrews to a torque of 54 ± 5 N·m (40 ± 4 lb ft).

12. Rotate fan blades (8) by hand through all positions in order to ensure that the fan operates freely.

13. Tighten all fan drive belts.

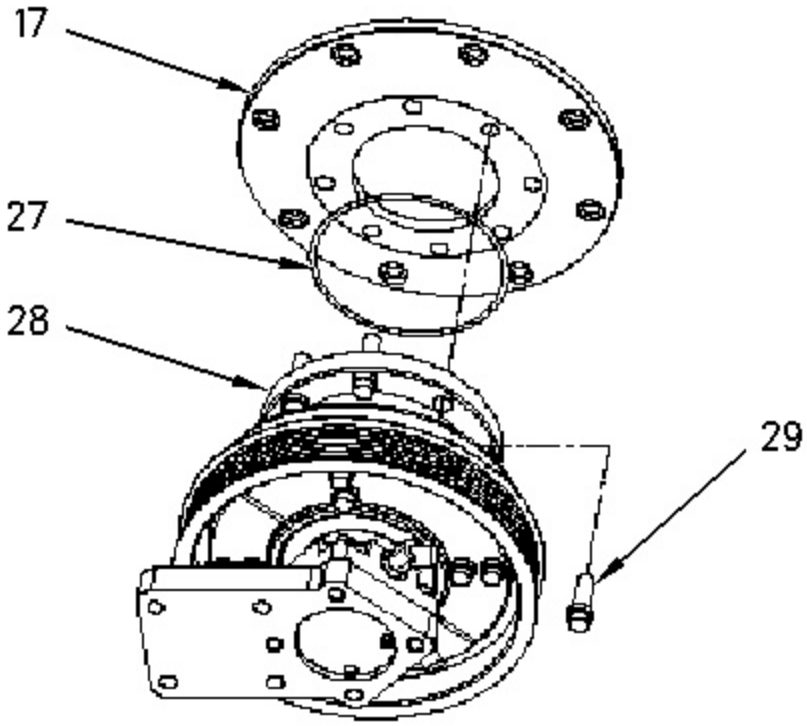


Illustration 11 g00905949

4. If necessary, remove fasteners (29) from bearing carrier (28) .
5. If necessary, remove O-ring (27) and flange (17) from bearing carrier (28) .

10. Place external seal (7) onto piston (15).

11. Insert both backup rings (16) on either side of external seal (7).

    Note: Make sure that the ends of the backup rings are enclosed on each other properly. See Illustration 3 for the correct positioning of the ends of the backup rings.

12. Place internal O-ring (17) into the groove on piston (15).

13. Apply a thin coating of oil onto external seal (7) and onto O-ring (17) of the piston.

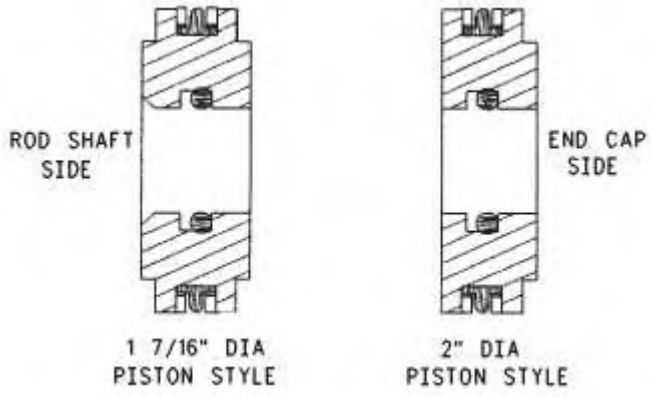


Illustration 5 g00906300

14. Push piston (15) into the rear of main shaft (12) and onto the end of rod shaft (3) until the piston rests against the shoulder of the rod shaft.

    Note: Some designs have a spacer that needs to be installed. The spacer is located between seal retainer (13) and the piston (15).

    Note: The orientation of the piston prior to installation is critical. There are two different styles of piston that are used. See Illustration 5 for the proper orientation.

    Note: Be careful when you slide piston (15) into main shaft (12) and onto the end of rod shaft (3). Do not damage external seal (7), backup rings (16), or O-ring (17).

15. Apply **9S-3263** Thread Lock Compound to the threads of hex nut (8).

16. Thread hex nut (8) onto rod shaft (3) and tighten the hex nut to a torque of 34 N·m (25 lb ft).

    Note: Slide the shafts and the piston in and out to make sure that the resistance is slight.

17. Push piston (15) until the piston comes to rest against seal retainer (13).

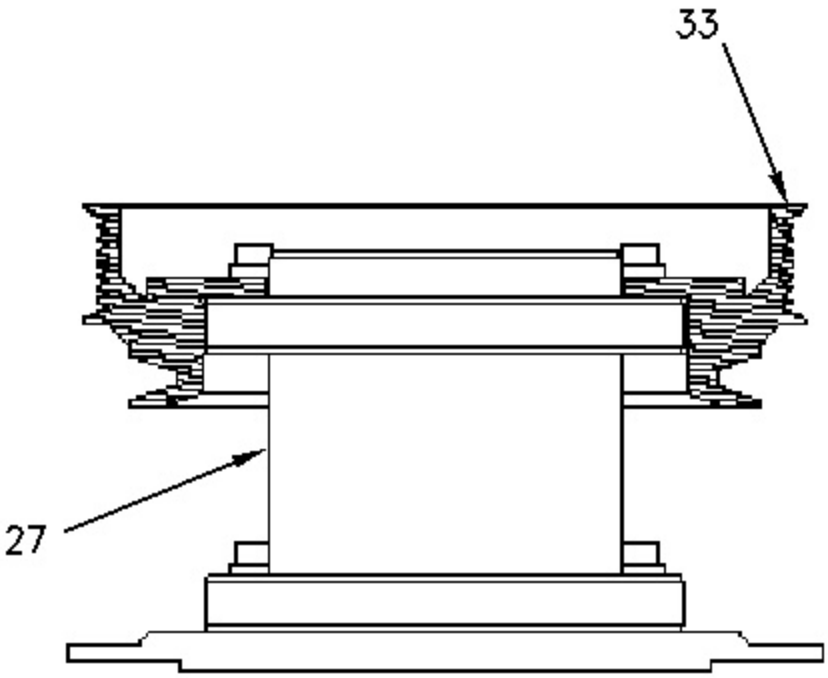


Illustration 14 g00906559

(C) The bearing covers are still in place.
(D) The bearing covers are removed.

2. Remove the plastic seal covers from either side of the bearing with a screwdriver or a pick.
3. Insert bearing (44) onto shifter block assembly (46).
4. Place shifter block plate (46) with the threaded holes on block (F). Refer to Illustration 26.
5. Position hub assembly (45) so that the holes that are 6.35 mm (0.25 inch) in diameter are facing upward.
6. Turn collar pins (43) within hub assembly (45) so that heads of the bolts (64) are facing upward.
7. Place the pivot blocks (42) onto collar pins (43) of the hub assembly.

   Note: Orient the smooth surface of the pivot blocks upward on the collar pins so that the pivot blocks are against the shoulder of the shifter block.

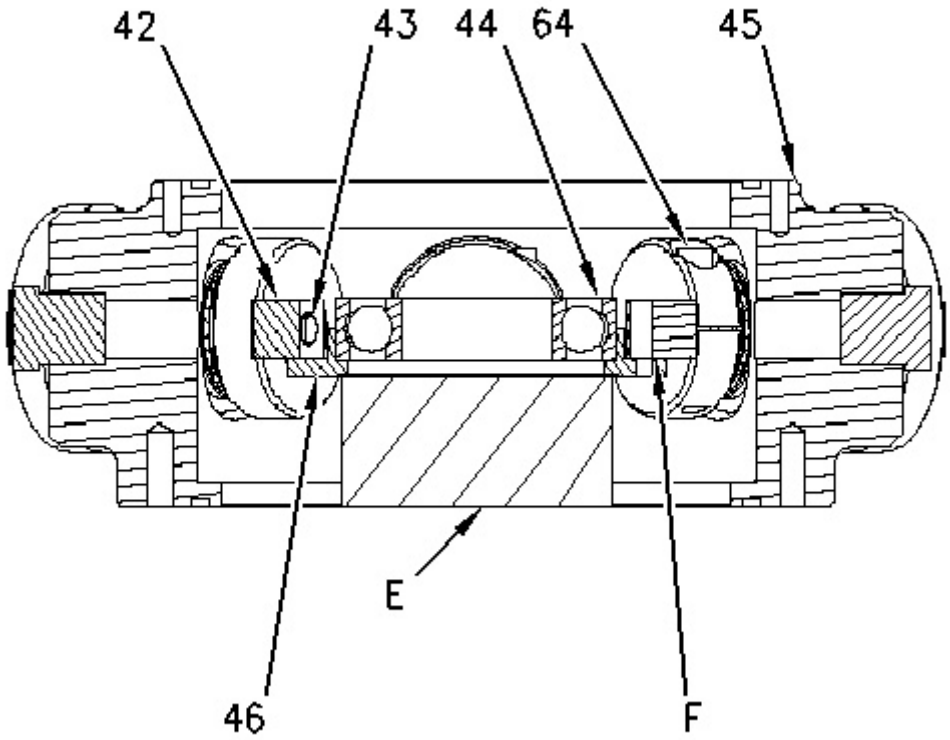


Illustration 26 g00906619

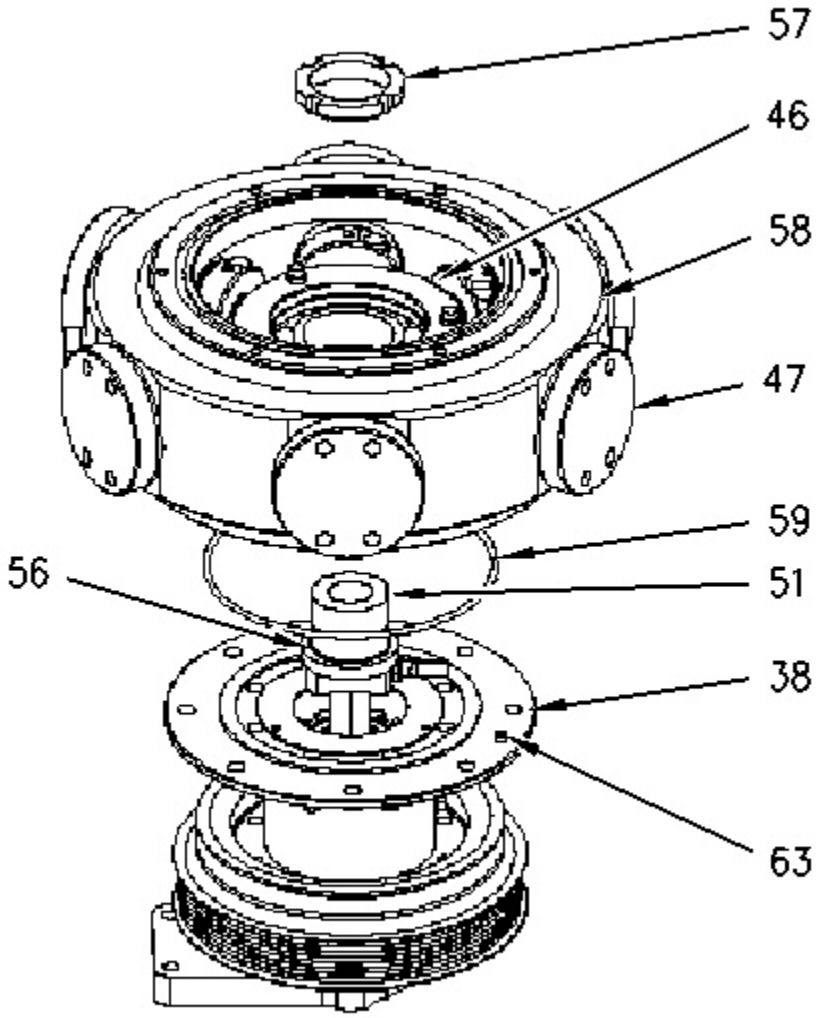


Illustration 36 g00907081

1. Install O-ring (59) into the O-ring groove on the hub assembly. Apply grease to hold the O-ring in place.
2. Install hub assembly (56) onto flange (38). Align the holes for the fasteners.

   Note: An alignment bolt (63) is used to align the hub assembly and the flange.
3. Install a few of the fasteners to hold the hub in place, and tighten the fasteners to a torque of 47 N·m (35 lb ft).
4. Rotate blade mounting shafts (47) so that shifter block assembly (46) comes to rest against thru bearing end (51) with shims (56).
5. Tighten locknut (57) onto thru bearing end to a torque of 33 N·m (25 lb ft).

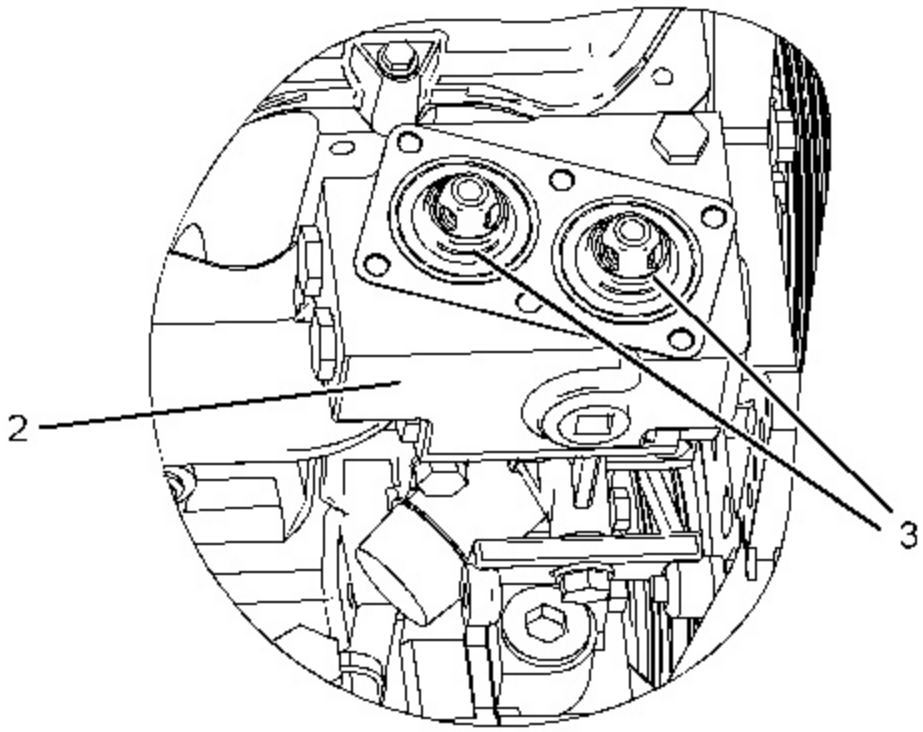


Illustration 2 g01026406

Note: Record the quantity of water temperature regulators that were removed.

3. Remove water temperature regulators (3) from water temperature regulator housing (2) .

Installation Procedure

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

(5) Distance from the first V-groove of the water pump pulley to the face of the housing ... 103.0 ± 0.3 mm (4.06 ± 0.01 inch)

(6) The bearing must not extend beyond the edge of the housing.

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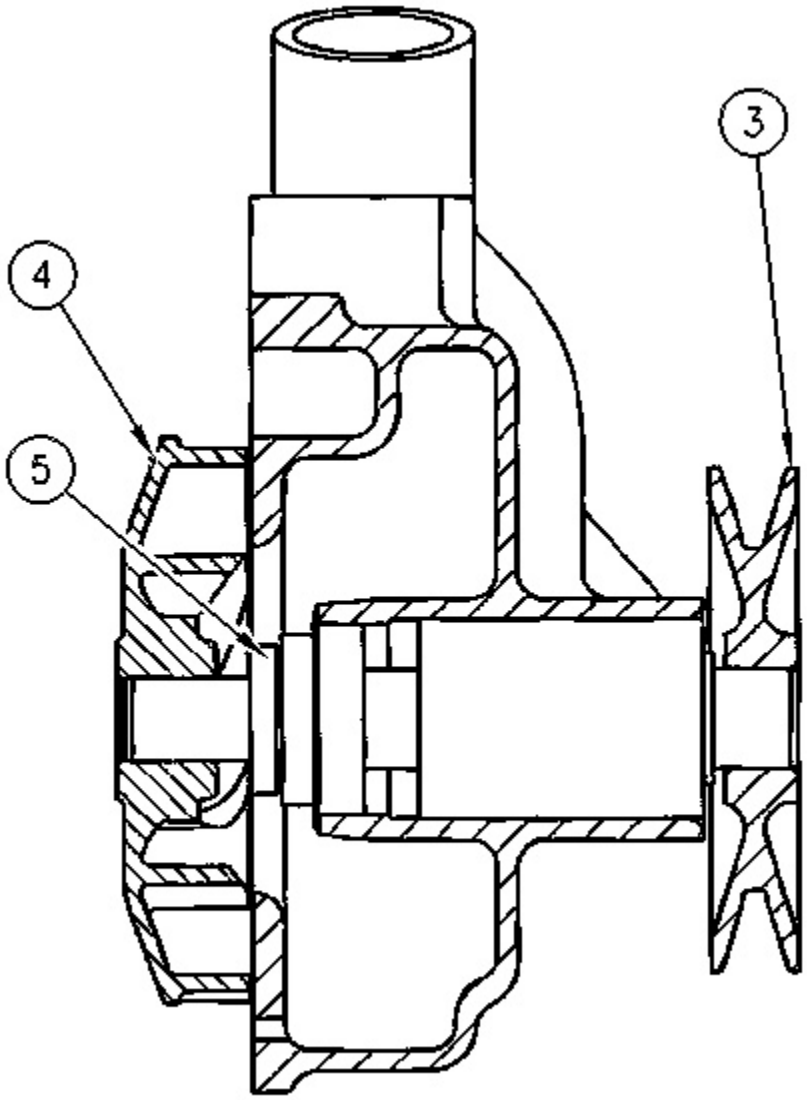

Illustration 3 g00614288

4. Install impeller (4) on the shaft of the water pump with a press. Install the impeller until the distance between the impeller and the machined surface of the water pump is 0.75 ± 0.25 mm (0.030 ± 0.010 inch).

filler cap only when the engine is stopped, and the filler cap is cool enough to touch with your bare hand.

WARNING

Personal injury can result from hot coolant, steam and alkali.

At operating temperature, engine coolant is hot and under pressure. The radiator and all lines to heaters or the engine contain hot coolant or steam. Any contact can cause severe burns.

Remove filler cap slowly to relieve pressure only when engine is stopped and radiator cap is cool enough to touch with your bare hand.

Cooling System Conditioner contains alkali. Avoid contact with skin and eyes.

WARNING

Hot oil and hot components can cause personal injury. Do not allow hot oil or hot components to contact the skin.

WARNING

Personal injury can result from contact with refrigerant.

Contact with refrigerant can cause frost bite. Keep face and hands away to help prevent injury.

Protective goggles must always be worn when refrigerant lines are opened, even if the gauges indicate the system is empty of refrigerant.

Always use precaution when a fitting is removed. Slowly loosen the fitting. If the system is still under pressure, release it slowly in a well ventilated area.

Personal injury or death can result from inhaling refrigerant through a lit cigarette.

Product: WHEEL LOADER
Model: 950G II WHEEL LOADER BAA
Configuration: 950G II WHEEL LOADER BAA00001-UP (MACHINE) POWERED BY 3126B Engine

Disassembly and Assembly
950G Series II Wheel Loader, 962G Series II Wheel Loader and IT62G Series II Integrated Toolcarrier Engine Supplement
Media Number -RENR4307-04 **Publication Date -01/08/2006** **Date Updated -31/08/2006**

i02008489

Radiator and Fan Group - Install

SMCS - 1353-012; 1356-012

Installation Procedure

Table 1

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
A	138-7574	Link Bracket	2

Illustration 1 g01038667

1. Use a suitable lifting device in order to carefully install the radiator and fan group. The weight of the radiator and fan group is approximately 455 kg (1000 lb).

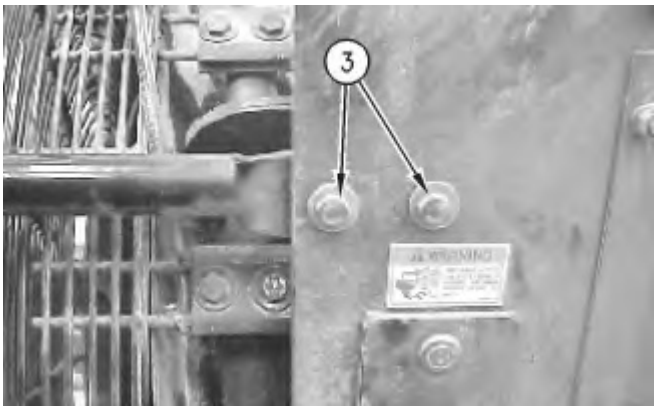

Illustration 3 g00845787

5. Remove two bolts (3) and the washers.

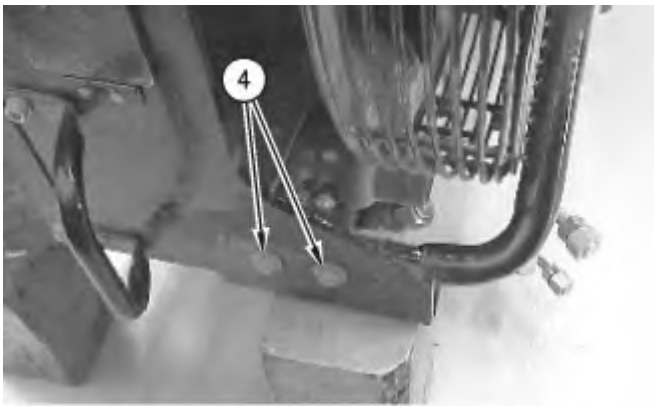

Illustration 4 g00845797

6. Remove two bolts (4) and the washers.

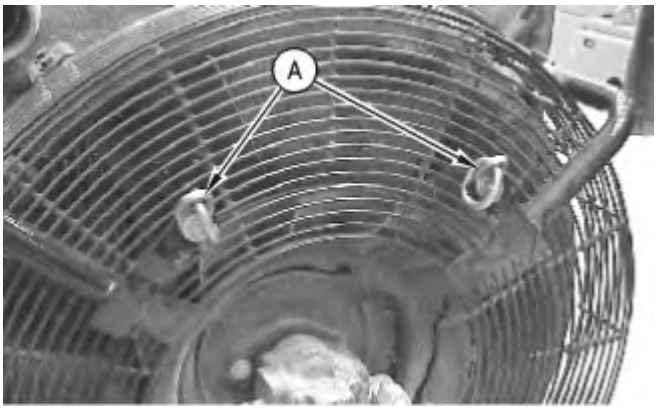

Illustration 9 g00845773

16. Attach a suitable lifting device and lifting slings to Tooling (A) .
17. Carefully install the fan and the fan guard.

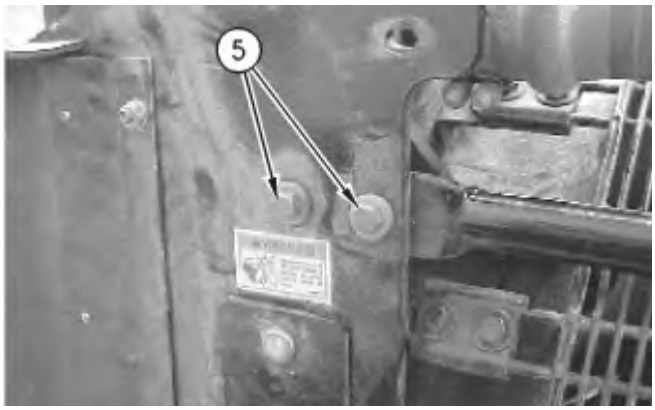

Illustration 10 g00845808

18. Install bolts (5) and the washers.

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.

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

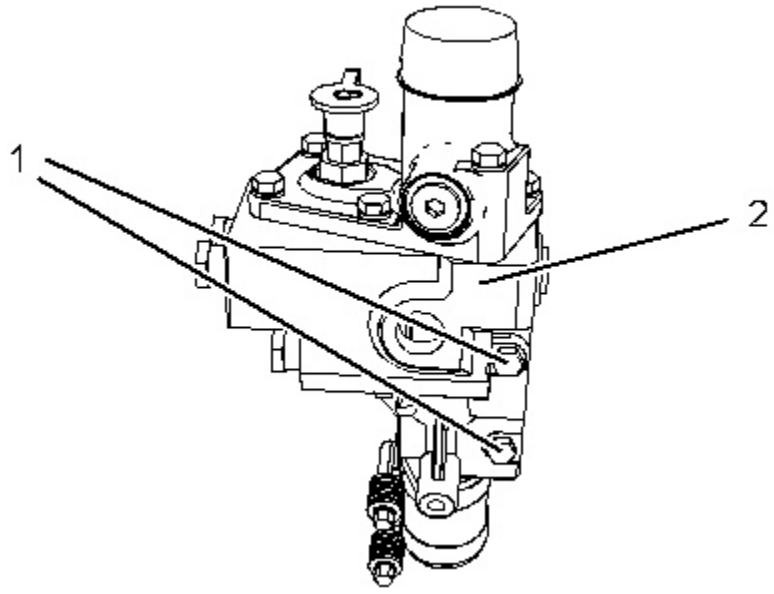

Illustration 1 g01029407

2. Remove bolts (1).
3. Remove water temperature regulator housing (2).

Cold Weather Starting

Starting the engine and operation in cold weather is dependent on the type of fuel that is used, the oil viscosity, and other optional starting aids.

Thu Dec 12 17:21:04 UTC+0400 2019

Product: WHEEL LOADER
Model: 950G II WHEEL LOADER BAA
Configuration: 950G II WHEEL LOADER BAA00001-UP (MACHINE) POWERED BY 3126B Engine

Troubleshooting
3126B Engines for the IT62G Series II Integrated Toolcarrier and for the 950G Series II and 962G Series II Wheel Loaders

Media Number -SENR9617-05 **Publication Date -01/07/2010** **Date Updated -28/07/2010**

i05451609

Engine Stalls at Low RPM

SMCS - 1915-035

Note: Refer to Troubleshooting, "Cat ET Service Features" for information about service features.

Probable Causes

- Unit injectors
- Fuel supply
- Air supply
- Engine idle
- Accessory equipment

Recommended Actions

Note: The procedures have been listed in order of probability. Complete the procedures in order.

Table 1

Troubleshooting Test Steps	Values	Results
1. Unit Injectors A. Check for correct installation of the J1/P1 and J2/P2 connectors for the Electronic Control Module (ECM). B. Check for correct installation of the J300/P300	Unit Injectors	**Result:** The J1/P1 and J2/P2 connectors have been installed correctly. **Result:** The J300/P300 connectors have been

		reuse. If sensor is not working properly replace the sensor.
4. Boost Pressure Sensor, "Fuel Position", and/or "FRC Fuel Limit" A. Monitor the status of "Fuel Position" and "Rated Fuel Limit" while the engine is operating under full load. If "Fuel Position" equals "Rated Fuel Limit", and "Fuel Position" is less than "FRC Fuel Limit" the Electronic Control Module (ECM) is providing the correct control. B. Monitor the status of "Boost Pressure" and "Atmospheric Pressure" on Cat ET and verify that there are no active codes for the boost pressure sensor. When the engine is not running, "Boost Pressure" should be 0 kPa (0 psi). **Note:** A problem with the "FRC Fuel Limit" will only cause black smoke during acceleration. A problem with the "FRC Fuel Limit" will not cause black smoke during steady state operation.	Pressure Sensor	**Result:** The boost pressure sensor, "Fuel Position" and "FRC Fuel Limit" are OK. Proceed to Test Step 5. **Result:** The boost pressure sensor, "Fuel Position" and "FRC Fuel Limit" are not correct and properly working. **Repair:** Perform the necessary repairs and return to service.
5. Flash File A. Verify that the correct flash file is installed.	Flash File	**Result:** The correct flash file is installed. Proceed to Test Step 6. **Result:** The correct flash file is not installed. **Repair:** Install the correct flash file and refer to Troubleshooting, "Flash Programming" for information.
6. Fuel Quality A. Verify that the fuel quality is correct. **Note:** Cold weather adversely affects the	Fuel Quality	**Result:** The fuel quality is correct. Proceed to Test Step 7. **Result:** The fuel quality is not correct.

1. Engine Oil Level **A.** Inspect the engine oil level.	Level	**Result:** The oil level is correct. Proceed to Test Step 2. **Result:** The oil level is not correct. **Repair:** If engine oil is low, add engine oil. Refer to the Operation and Maintenance Manual.
2. Engine Oil filters and Oil Filter Bypass Valve **A.** Check the service records of the engine for information that is related to the last oil change. **B.** Check the operation of the oil filter bypass valve.	Oil Filter	**Result:** The engine is up to date with service and the operation of the oil filter bypass valve is working correctly. Proceed to Test Step 3. **Result:** The engine is not up to date with service and the oil filter bypass valve is not properly operating. **Result:** Perform an oil change on the engine with new filters and clean the bypass valve and the housing. If necessary, install new parts.
3. Engine Oil Pump **A.** Check for blockage of the inlet screen for the engine oil pump. **B.** Check the components of the engine oil pump for excessive wear.	Oil Pump	**Result:** There is no blockage of the inlet screen and the engine oil pump components do not have excessive wear. Proceed to Test Step 4. **Result:** There is blockage of the inlet screen and/or the engine oil pump components have excessive wear. **Repair:** Remove blockage

Product: WHEEL LOADER
Model: 950G II WHEEL LOADER BAA
Configuration: 950G II WHEEL LOADER BAA00001-UP (MACHINE) POWERED BY 3126B Engine

Troubleshooting
3126B Engines for the IT62G Series II Integrated Toolcarrier and for the 950G Series II and 962G Series II Wheel Loaders
Media Number -SENR9617-05 **Publication Date -01/07/2010** **Date Updated -28/07/2010**

i01710949

Poor Acceleration or Response

SMCS - 1000-035

Probable Causes

- Diagnostic codes
- Event codes
- Starting aids
- Personality module (flash file)
- Throttle signal
- Electrical connectors
- Unit injectors
- Turbocharger outlet pressure sensor
- Air inlet and exhaust system
- Fuel supply

Recommended Actions

Diagnostic Codes and Event Codes

Certain diagnostic codes and/or event codes may cause poor performance. Connect the Caterpillar Electronic Technician (Cat ET) and check for active codes and/or logged codes. Troubleshoot any codes that are present before continuing with this procedure.

Connect the steering frame lock link between the front and rear frames before working on machine. Secure clevis pin with locking pin.

Before operating the machine, fasten the steering frame lock link into the stored position and secure the clevis pin with locking pin.

Failure to lock into the stored position before operating can result in loss of steering.

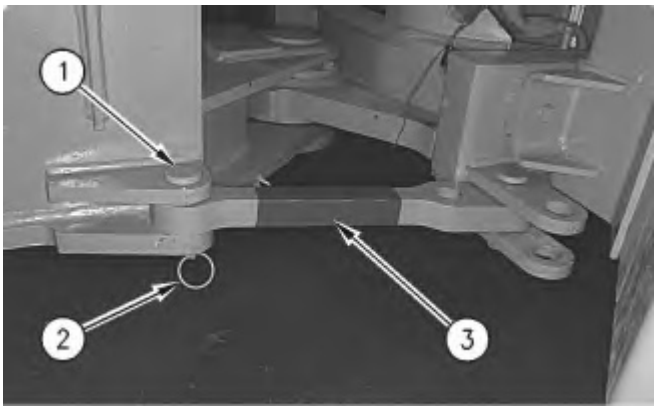

Illustration 3 g00288846

1. Remove locking pin (2) and pin (1). Move steering frame lock (3) to the storage position.

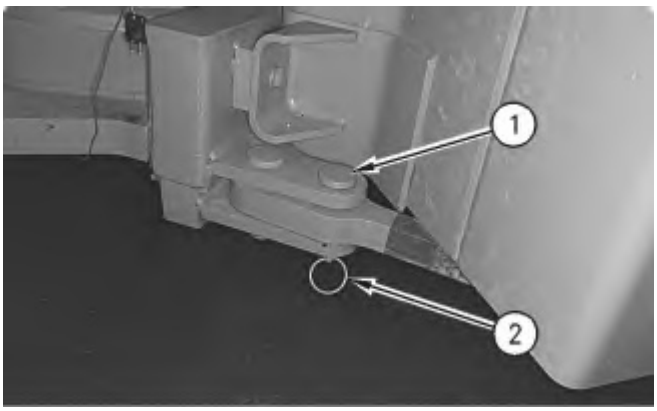

Illustration 4 g00288845

2. Install pin (1) and locking pin (2) .

3. Remove bolt (2), the washer, and the clip.

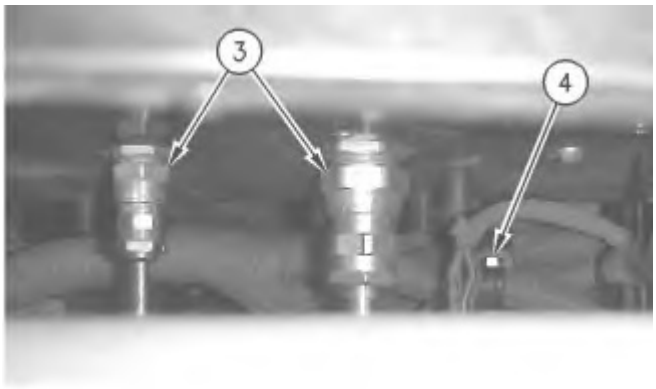

Illustration 2 g00846629

Back of Cab, Top View

4. Disconnect two hose assemblies (3) .
5. Remove bolt (4), the washer, and the clips.

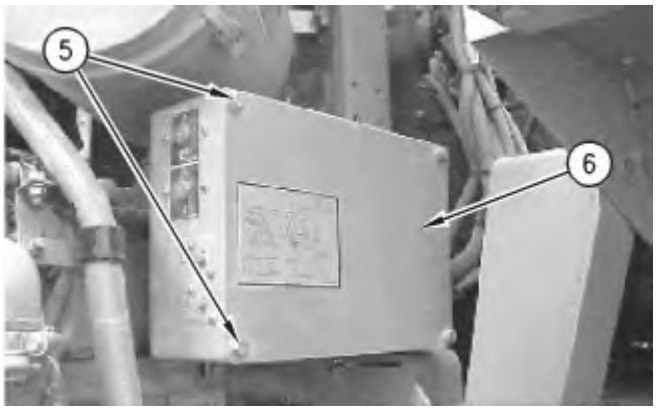

Illustration 3 g00846635

6. Remove four bolts (5) and the washers.
7. Remove cover (6) .

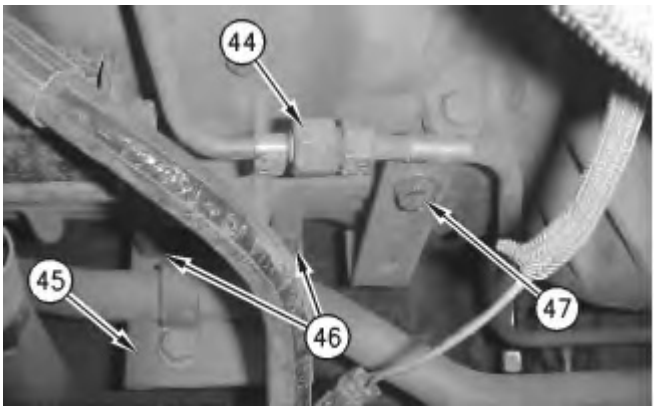

Illustration 26 g00846767

43. Disconnect tube assembly (44) .
44. Remove bolt (47), the washer, and the clip.
45. Remove two bolts (46), the washers, and the spacers from the bottom of the oil pan. Place bracket assembly (45) aside.

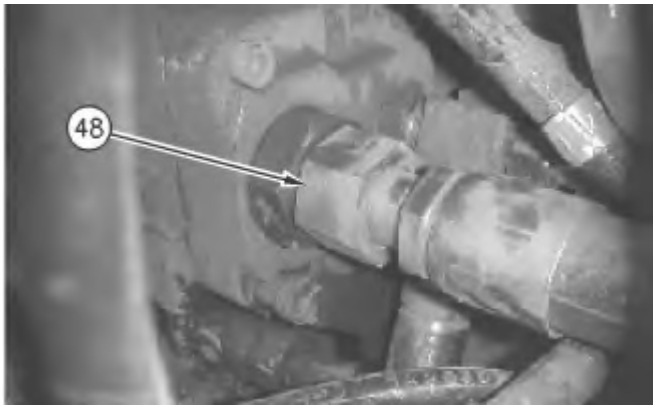

Illustration 27 g00846771

46. Disconnect hose assembly (48) .

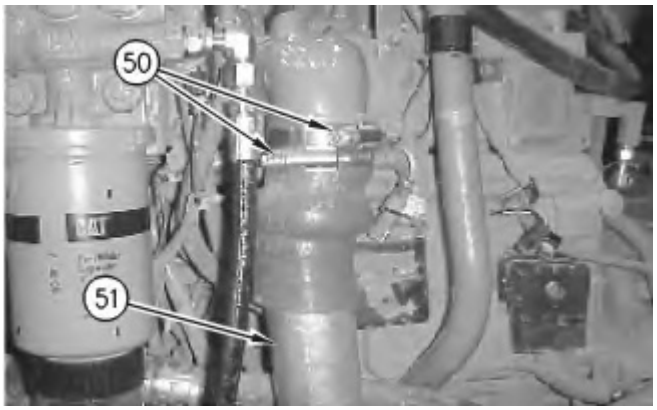

Illustration 9 g00846777

13. Connect tube assembly (51) .
14. Tighten two hose clamps (50) .

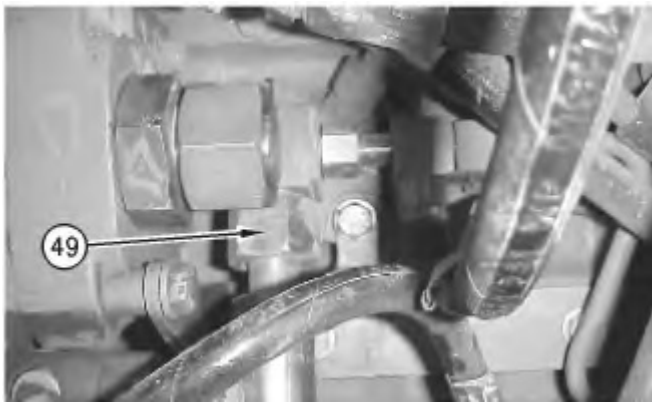

Illustration 10 g00846773

15. Connect hose assembly (49) .

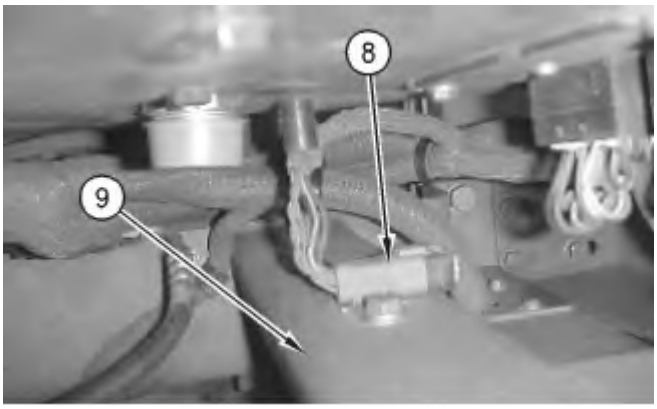

Illustration 33 g00846648

Back of Cab, Top View

50. Connect electrical connector (8) to air cleaner support (9) .

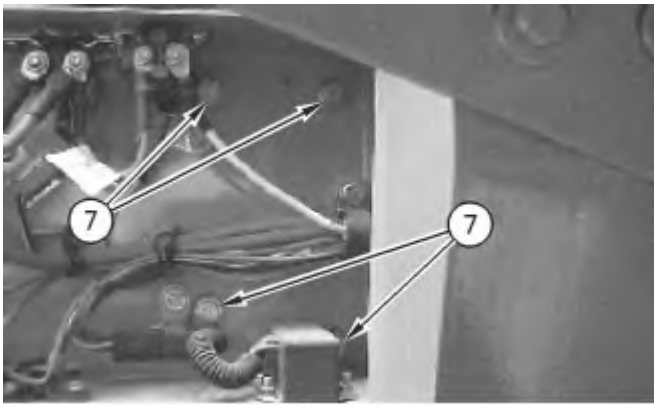

Illustration 34 g00846642

51. Install the relay panel.
52. Install four bolts (7) and the washers.

- Actual actuation pressure

Desired actuation pressure is the IAP that is required by the system for optimum engine performance. The desired actuation pressure is established by the performance maps in ECM (17). The ECM selects the desired actuation pressure. The ECM bases the selection on the signal inputs from the pressure sensors, the temperature sensors, and the speed/timing sensors. The desired actuation pressure is constantly changing due to changing engine speed and due to changing engine load. The desired actuation pressure is only constant under steady state conditions (steady engine speed and load).

Actual actuation pressure is the actual system pressure of the actuation oil that is powering the injectors (5). IAPCV (6) is constantly changing the amount of pump flow that is discharged to the drain. The pump flow is discharged to the drain in order to match the actual actuation pressure to the desired actuation pressure.

Three components operate together in order to control IAP:

- ECM (17)
- IAPCV (6)
- IAP sensor (7)

ECM (17) selects the desired actuation pressure. The desired actuation pressure is based on both the sensor input and the performance maps. The ECM sends a control current to IAPCV (6) in order to change the actual actuation pressure. The IAPCV reacts to the electrical current from the ECM in order to change the actual actuation pressure. The actual actuation pressure is changed when the IAPCV discharges pump flow to the drain. The IAPCV acts as an electrically controlled relief valve. IAP sensor (7) monitors the actual actuation pressure in the high pressure oil passage. The IAP sensor reports the actual actuation pressure to the ECM by sending a signal voltage to the ECM.

The control system for the IAP operates in a cycle. ECM (17) selects the desired actuation pressure. Then, the ECM sends an electrical current to IAPCV (6) that should produce that pressure. The IAPCV reacts to the electrical current from the ECM by changing the pressure relief setting, which changes the actual actuation pressure. IAP sensor (7) monitors the actual actuation pressure and the IAP sensor sends a signal voltage back to the ECM. The ECM interprets the signal voltage from the IAP sensor in order to calculate the actual actuation pressure. Then, the ECM compares the actual actuation pressure to the desired actuation pressure in order to adjust the electrical current to the IAPCV. The IAPCV responds to the change in electrical current by changing the actual actuation pressure. This process is repeated 67 times per second. This cycle of constant repetition is called a closed loop control system.

Most of the high pressure oil flow from unit injector hydraulic pump (1) is used in order to power HEUI injectors (5). Excess flow is the amount of pump flow that is not required in order to meet the desired actuation pressure. The excess flow is returned to the drain through IAPCV (6). Excess flow from the IAPCV flows upward through a U-shaped tube in the pump reservoir. The excess flow travels through a drilled passage to the front of the pump. Drain oil flows out of the front of the pump over the pump drive gear and flows down the engine front gear train to sump.

Operation of the IAPCV

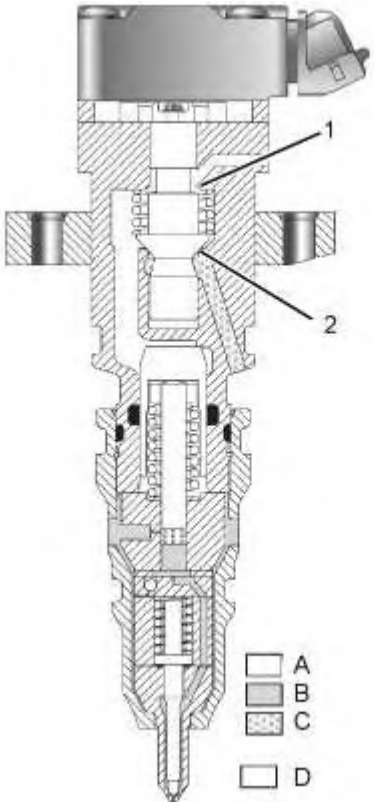

Illustration 10 g01108083

HEUI injector (Pre-injection)

(1) Upper poppet seat (open position)

(2) Closed lower poppet seat

(A) Drain (atmosphere)

(B) Fuel supply pressure

(C) Actuation oil pressure

(D) Moving parts

All of the internal components have been returned to the spring loaded position during the pre-injection. The solenoid is not energized and the lower poppet seat (2) is closed. When the lower poppet seat is closed, the lower poppet seat blocks high pressure actuation oil from entering the unit injector. The plunger and the intensifier piston are at the top of the bore and the plunger cavity is full of fuel. Fuel pressure in the plunger cavity is equal to the fuel supply pressure. The fuel supply pressure is approximately 450 kPa (66 psi).

Pilot Injection

(1) A steady stream of small bubbles with a diameter of approximately 1.60 mm (0.063 inch) is an acceptable amount of air in the fuel.

(2) Bubbles with a diameter of approximately 6.35 mm (0.250 inch) are also acceptable if there are 2 seconds to 3 seconds intervals between bubbles.

(3) Excessive air bubbles in the fuel are not acceptable.

2. If excessive air is seen in the sight gauge in the fuel return line, install a second sight gauge at the inlet to the fuel transfer pump. If a second sight gauge is not available, move the sight gauge from the fuel return line and install the sight gauge at the inlet to the fuel transfer pump. Observe the fuel flow during engine cranking. Look for air bubbles in the fuel. If the engine starts, check for air in the fuel at varying engine speeds.

   If excessive air is not seen at the inlet to the fuel transfer pump, the air is entering the system after the fuel transfer pump. Proceed to Step 3 of "Adjustment Procedure".

   If excessive air is seen at the inlet to the fuel transfer pump, air is entering through the suction side of the fuel system.

Adjustment Procedure

NOTICE

To avoid damage, do not use more than 55 kPa (8 psi) to pressurize the fuel tank.

1. Pressurize the fuel tank to 35 kPa (5 psi). Do not use more than 55 kPa (8 psi) in order to avoid damage to the fuel tank. Check for leaks in the fuel lines between the fuel tank and the fuel transfer pump. Repair any leaks that are found. Check the fuel pressure in order to ensure that the fuel transfer pump is operating properly. For information about checking the fuel pressure, see Testing and Adjusting, "Fuel System Pressure - Test".

2. If the source of the air is not found, disconnect the supply line from the fuel tank and connect an external fuel supply to the inlet of the fuel transfer pump. If this action corrects the problem, repair the fuel tank or the stand pipe in the fuel tank.

3. If the injector sleeve is worn or damaged, combustion gases may be leaking into the fuel system. Also, if the O-rings on the injector sleeves are worn, missing, or damaged, combustion gases may leak into the fuel system.

6. Remove the suspect unit injector and check the unit injector for signs of exposure to coolant. Exposure to coolant will cause rust to form on the injector. If the unit injector shows signs of exposure to coolant, remove the injector sleeve and inspect the injector sleeve. Replace the injector sleeve if the injector sleeve is damaged. Check the unit injector for an excessive brown discoloration that extends beyond the injector tip. If excessive discoloration is found, check the quality of the fuel. Refer to Testing and Adjusting, "Fuel Quality - Test". Replace the seals on the injector and reinstall the injector. Refer to Disassembly and Assembly Manual, "Unit Injector - Install". Also refer to Disassembly and Assembly Manual, "Unit Injector Sleeve - Install". Inspect the injector for deposits of soot that are above the surface of the seat of the injector. Deposits of soot indicate combustion gas leakage. The source of the leak should be found, and the source of the leak should be remedied. The injector will not need to be replaced if combustion gas leakage was the problem.

7. If the problem is not resolved, replace the suspect injector with a new injector. In order to verify that the new injector is working properly, perform the Cylinder Cutout Test. Use the Caterpillar Electronic Technician (ET).

Thu Dec 12 17:28:00 UTC+0400 2019

FINNING CAT

Service Information System

Shutdown SIS

Previous Screen

Product: WHEEL LOADER
Model: 950G II WHEEL LOADER BAA
Configuration: 950G II WHEEL LOADER BAA00001-UP (MACHINE) POWERED BY 3126B Engine

Troubleshooting
3126B Engines for the IT62G Series II Integrated Toolcarrier and for the 950G Series II and 962G Series II Wheel Loaders

Media Number -SENR9617-05 **Publication Date -01/07/2010** **Date Updated -28/07/2010**

i05859665

Engine Misfires, Runs Rough or Is Unstable

SMCS - 1000-035

Note: If the symptom is intermittent and the symptom cannot be repeated, refer to troubleshooting without a diagnostic code Troubleshooting, "Intermittent Low Power or Power Cutout". If the symptom is consistent and the symptom can be repeated, continue with this procedure.

Probable Causes

- Diagnostic codes
- Electrical connectors
- Fuel supply Air inlet and exhaust system
- Throttle signal
- Cold mode
- Injection actuation pressure
- Unit injectors

Recommended Actions

Note: If the symptom only occurs under certain operating conditions (high idle, full load, engine operating temperature, etc.), test the engine under those conditions. Troubleshooting the symptom under other conditions can give misleading results.

Table 1

Troubleshooting Test Steps	Values	Results

Thu Dec 12 17:28:51 UTC+0400 2019

5. Check fuel quality. In temperatures below 0 °C (32 °F), check for solidified fuel (wax). Refer to Special Instruction, SEBD0717, "Diesel Fuels And Your Engine".

6. Check the fuel pressure after the fuel filter while the engine is being cranked. Refer to Testing and Adjusting for the correct pressure values. If the fuel pressure is low, replace the fuel filters. If the fuel pressure is still low, check the following items: fuel transfer pump, fuel transfer pump coupling and fuel pressure regulating valve. Refer to Testing and Adjusting for more information.

Thu Dec 12 17:29:17 UTC+0400 2019

1		
2		
3		
4		
High Idle		
Step	**Actual injection pressure from Cat ET**	**"Injection Pressure Percentage Output" from Cat ET**
1		
2		
3		
4		

Expected Result:

The "Injection Actuation Pressure Output" is between 0 percent and 65 percent.

Results:

- **OK -** The "Injection Actuation Pressure Output" is within specifications.

  Repair: The replacement of the IAPCV corrected the problem. Run the engine under normal operating conditions in order to verify that the original problem has been resolved.

  STOP

- **Not OK -** The "Injection Actuation Pressure Output" is not within specifications. Reinstall the original IAPCV. Proceed to Test Step 14.

Test Step 14. Remove the IAPCV and Check the Oil Pressure

A. Remove the IAPCV. Refer to Disassembly and Assembly, "Injection Actuation Pressure Control Valve - Remove and Install".

B. Replace the IAPCV with a **219-2368** Plug (DIAGNOSTIC) and **9X-1484** Seal Kit .

C. Locate the high pressure oil line that supplies high pressure oil to the cylinder head. Remove the oil line and install the **8T-0852** Pressure Gauge to the line or to the high pressure port at the pump. Crank the engine and record the oil pressure that is indicated on the gauge.

Note: The pressure readings may vary between gauges.

_____ Observed pressure reading

_____ Observed RPM

Product: WHEEL LOADER
Model: 950G II WHEEL LOADER BAA
Configuration: 950G II WHEEL LOADER BAA00001-UP (MACHINE) POWERED BY 3126B Engine

Troubleshooting
3126B Engines for the IT62G Series II Integrated Toolcarrier and for the 950G Series II and 962G Series II Wheel Loaders

Media Number -SENR9617-05 **Publication Date -01/07/2010** **Date Updated -28/07/2010**

i02391874

Injector Solenoid Circuit - Test

SMCS - 1290-038

System Operation Description:

- An injector solenoid may have a problem.
- You have been directed to this procedure from Troubleshooting, "Troubleshooting without a Diagnostic Code".
- There is an active diagnostic code for an injector solenoid.

Use this procedure for the following diagnostic codes:

- 1-11 Injector Cylinder 1 fault
- 2-11 Injector Cylinder 2 fault
- 3-11 Injector Cylinder 3 fault
- 4-11 Injector Cylinder 4 fault
- 5-11 Injector Cylinder 5 fault
- 6-11 Injector Cylinder 6 fault

Perform this procedure under conditions that are identical to the conditions that exist when the problem occurs. Typically, problems with the injector solenoid occur when the engine is warmed up and/or when the engine is under vibration (heavy loads).

These engines have Hydraulically Actuated Electronically Controlled Unit Injectors (HEUI). The Engine Control Module (ECM) sends a 105 volt pulse to each injector solenoid. The pulse is sent at the proper time and at the correct duration for a given engine load and speed. The solenoid is mounted on top of the fuel injector body.

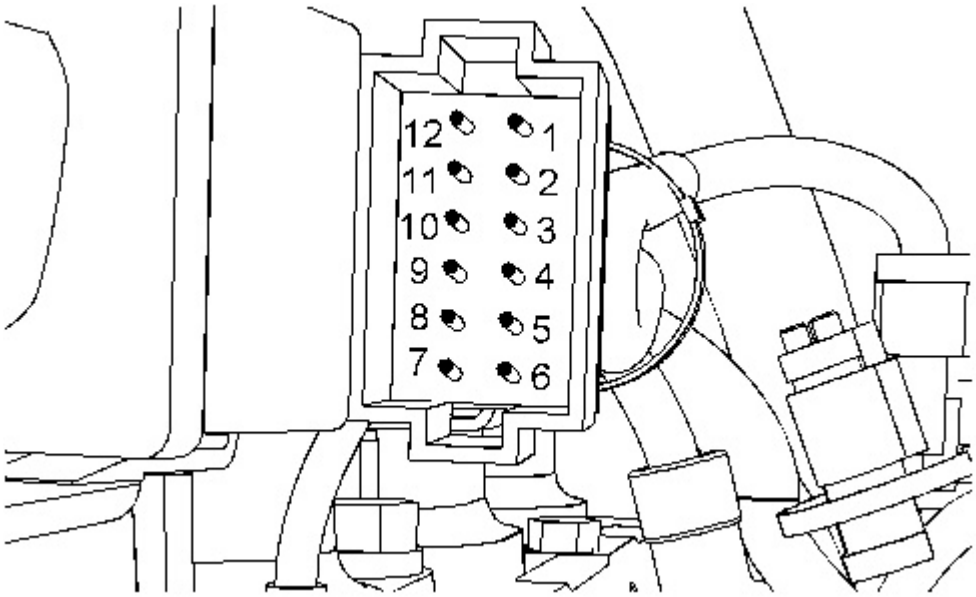

Illustration 6 g01183212

Terminals at the connector for the injector harness that are associated with the injector solenoids

(1) Injector 1 supply

(2) Injector 2 supply

(3) Injector 3 supply

(4) Injector 4 supply

(5) Injector 5 supply

(6) Injector 6 supply

(7) Injector 6 return

(8) Injector 5 return

(9) Injector 4 return

(10) Injector 3 return

(11) Injector 2 return

(12) Injector 1 return

D. Insert one end of a jumper wire onto the pin of the supply wire of the suspect injector. Insert the other end of the jumper wire onto the pin of the return wire of the suspect injector. For example, if injector 5 is the problem injector, insert the jumper onto terminal 5 and into terminal 8 of the connector for the injector harness.

   Ensure that the ends of the jumper wire are not in contact with any of the other terminals in the connector.

E. Restore electrical power to the ECM.

Apply **154-9731** Thread Lock Compound to the following distance from the top of the stud. ... 24.0 mm (0.9 inch)
Tighten the stud to the following torque. ... 50 ± 5 N·m (37 ± 4 lb ft)

Dimension (A) ... 21.4 mm (0.84 inch)

(13) Electrical connection

Voltage ... 24.0 ± 2.0 VDC

Water Separator and Primary Fuel Filter

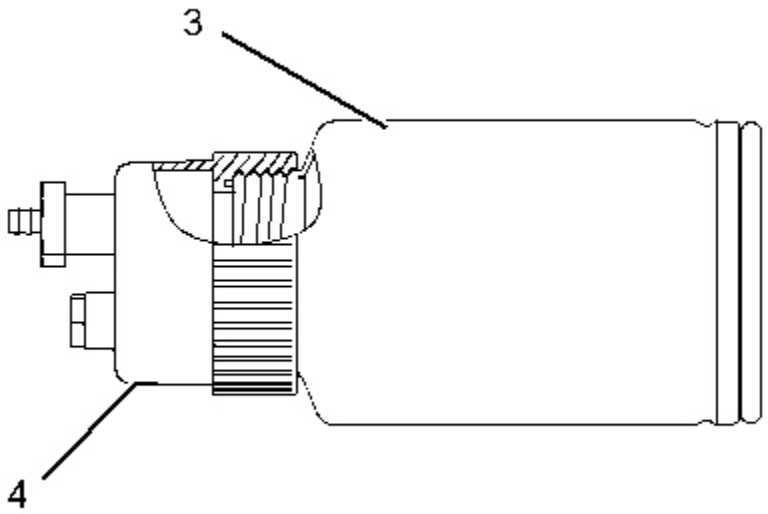

Illustration 3 g01138402

Use the following procedure in order to assemble the water separator and fuel filter:

1. Remove bowl (4) from the bottom of fuel filter (3) .
2. Remove the O-ring seal from the bowl. Discard the O-ring seal.

   Note: Replacement filters include a new O-ring seal. Reuse bowl (4) and use a new O-ring seal whenever a new fuel filter is installed.
3. Lubricate the new O-ring seal with clean oil. Install the new O-ring seal in the groove of bowl (4) .
4. Thread the bowl (4) onto the bottom of fuel filter (3) and tighten the bowl to 15 N·m (11 lb ft).

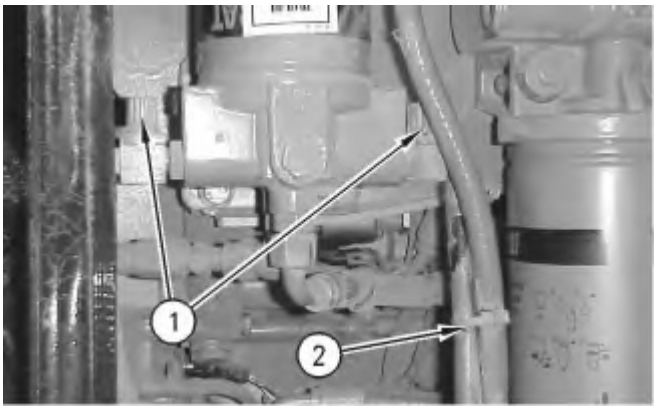

Illustration 5 g00842408

3. Install the secondary fuel filter element.
4. Install a new wire tie (2) .
5. Close drain valves (1) .
6. Close the engine hood.

End By: Separate the steering frame lock. Refer to Disassembly and Assembly, "Steering Frame Lock - Separate and Connect".

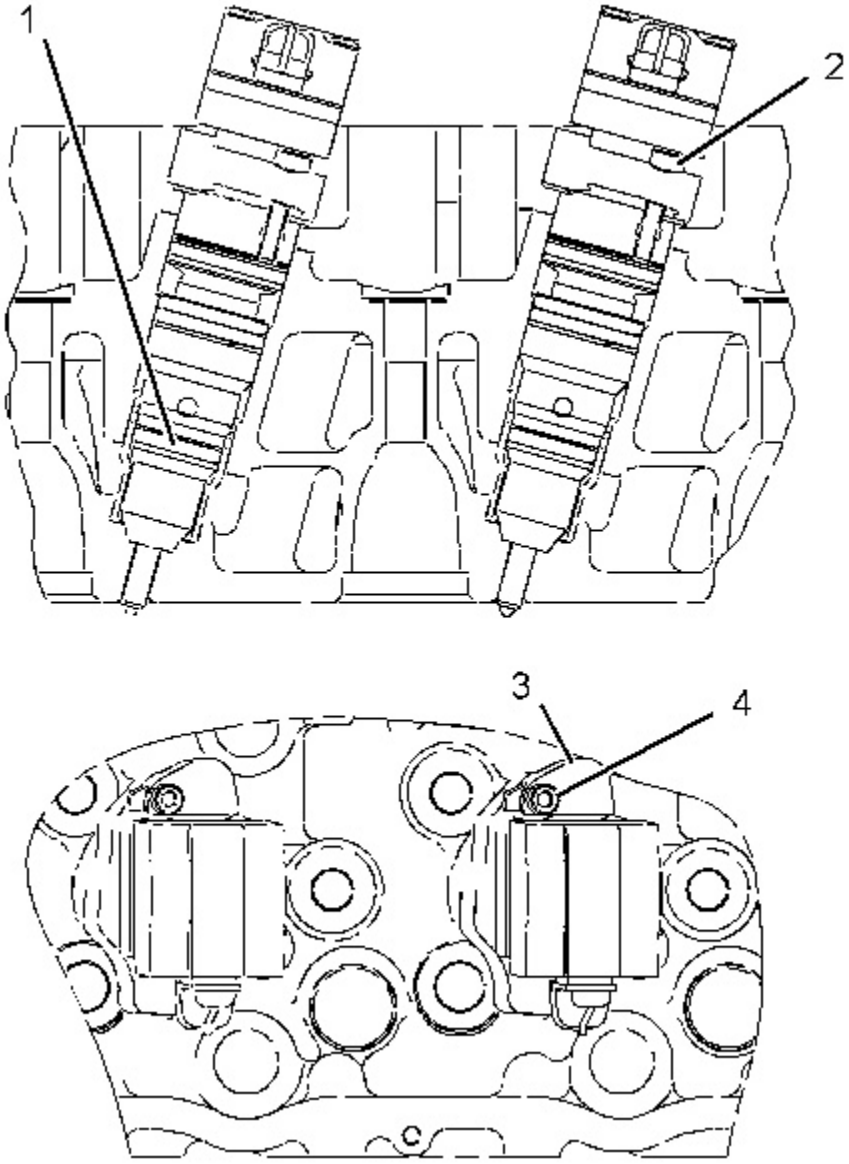

Illustration 1 g01138493

(1) Lubricate the bore slightly. Use the lubricant that is being sealed.

(2) Tighten the bolt to the following torque. ... 6 ± 1 N·m (55 ± 9 lb in)

(3) Position oil deflector (3).

(4) Tighten the bolt to the following torque. ... 12 ± 3 N·m (105 ± 27 lb in)