
Lesson 3: 950G Wheel Loader Hydrostatic Fan Drive System

Introduction

The 950G Wheel Loader Hydrostatic Fan Drive System is similar to the hydrostatic fan drive systems used on other Caterpillar machines. The information learned in this lesson will allow students to understand, test and adjust the 950G Wheel Loader hydrostatic fan drive systems and the fan drive used on other machines.

Objectives

Upon completion of this lesson, the student will be able to:

1. Identify components of the 950G Wheel Loader hydrostatic fan drive system.
2. State the function of the components in the 950G Wheel Loader hydrostatic fan drive system.
3. Trace the oil flow through the 950G Wheel Loader hydrostatic fan drive system.
4. Perform the testing and adjusting procedures for Fan Drive Pump Pressure and Fan Drive Motor Speed as stated in the 950G and 962G Wheel Loaders Electro-Hydraulic System, Testing and Adjusting Module (Form No. RENR2146) or for the Gear Pump Pressure (Fan Drive) and Gear Motor Speed (Fan Drive) as stated in the 950G and 962G Wheel Loader and IT62G Integrated Toolcarrier Hydraulic System, Testing and Adjusting Module (Form No. SENR1390).

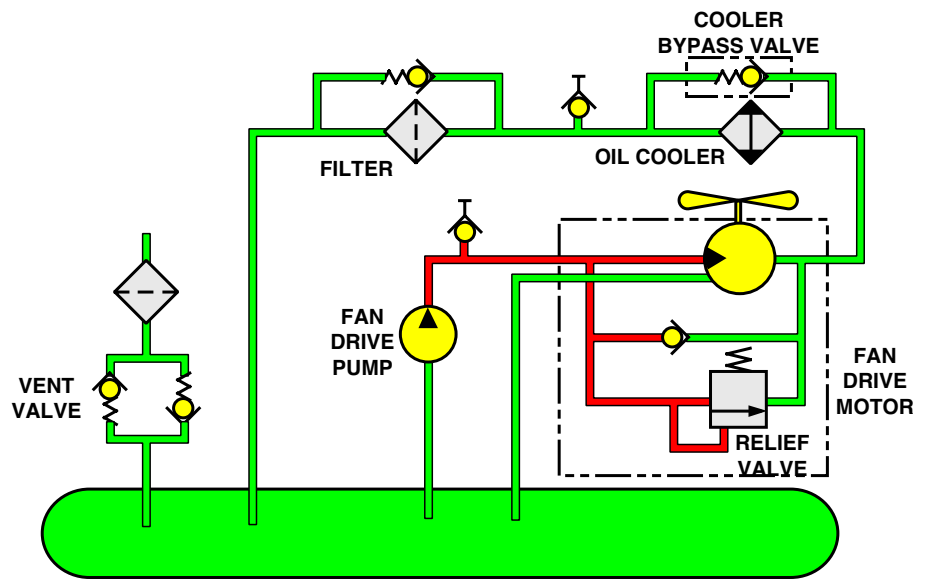


Fig. 3.3.1 Fan Drive System Schematic

Fan Drive System

The fan drive system cools and filters the oil from the hydraulic tank.

An engine driven gear pump located on the right side of the engine pulls oil from the implement, steering and brake hydraulic tank and sends the flow to the hydraulic fan motor located at the rear of the machine. The hydraulic fan motor turns the fan. When the pressure required to turn the fan exceeds the motor relief valve setting, some pump flow bypasses the fan drive motor through the relief valve and goes directly to the motor return oil outlet. The fan motor return oil flows through the hydraulic oil cooler and filter to the tank.

The hydraulic oil cooler is attached to the front of the radiator above the air conditioner condenser.

The fan sends air flow to remove the heat from the engine coolant in the radiator, the hydraulic oil in the oil cooler, and the refrigerant in the air conditioner condenser.

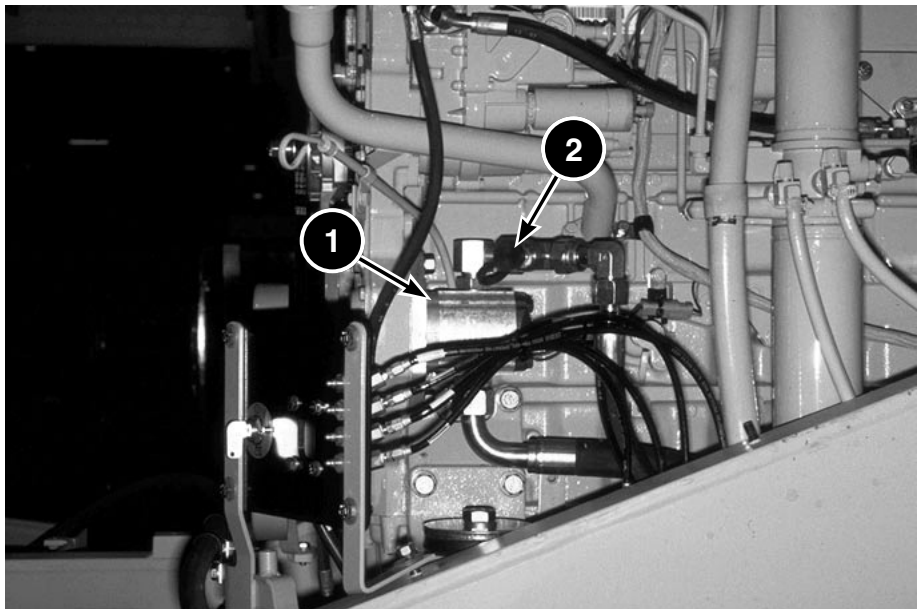


Fig. 3.3.2 Fan Drive Pump and System Pressure Tap

Fan Drive Pump and System Pressure Tap

The fan drive pump (1) is located on the right rear of the machine at the front gear group of the engine. The pump pulls hydraulic oil from the tank and sends the flow to the hydraulic fan motor at the rear of the machine. Also shown is the fan drive system pressure tap (2).

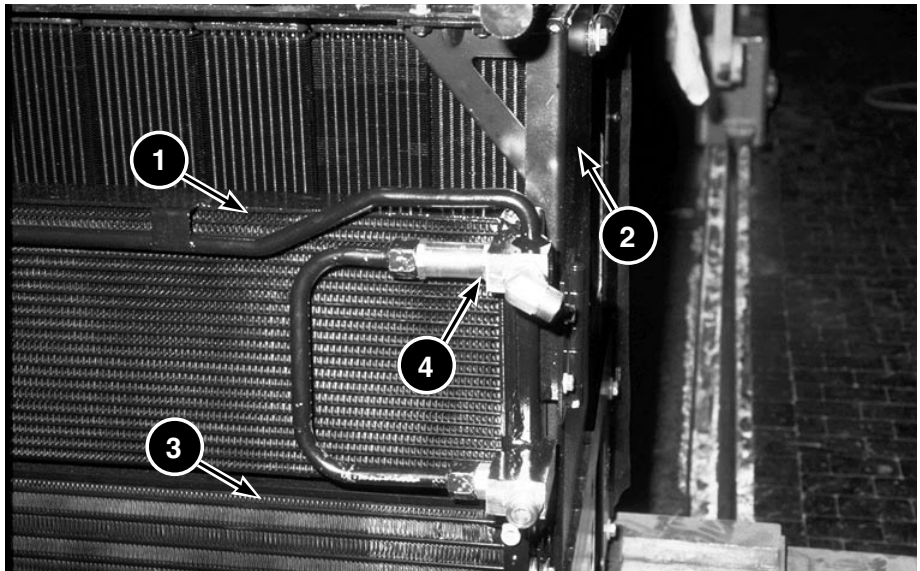


Fig. 3.3.3 Fan Drive Oil Cooler and Oil Cooler Bypass

Fan Drive Oil Cooler and Oil Cooler Bypass

The hydraulic oil cooler (1) is attached near the top of the radiator (2). Also shown is the optional air conditioner condenser (3).

The hydraulic oil cooler and the air conditioner condenser can be moved aside to clean the radiator cores.

An oil cooler bypass valve (4) limits the maximum oil pressure in the oil cooler to 448 ± 55 kPa (65 ± 8 psi). The bypass valve also opens when the engine is initially started, allowing the cold hydraulic oil that cannot easily flow through the cooler to bypass the cooler and flow directly to the hydraulic oil filter. When the temperature of the oil increases and the pressure of the oil decreases, the bypass valve spring overcomes the pressure of the oil and the bypass valve closes, causing the oil to flow through the cooler before going to the filter.

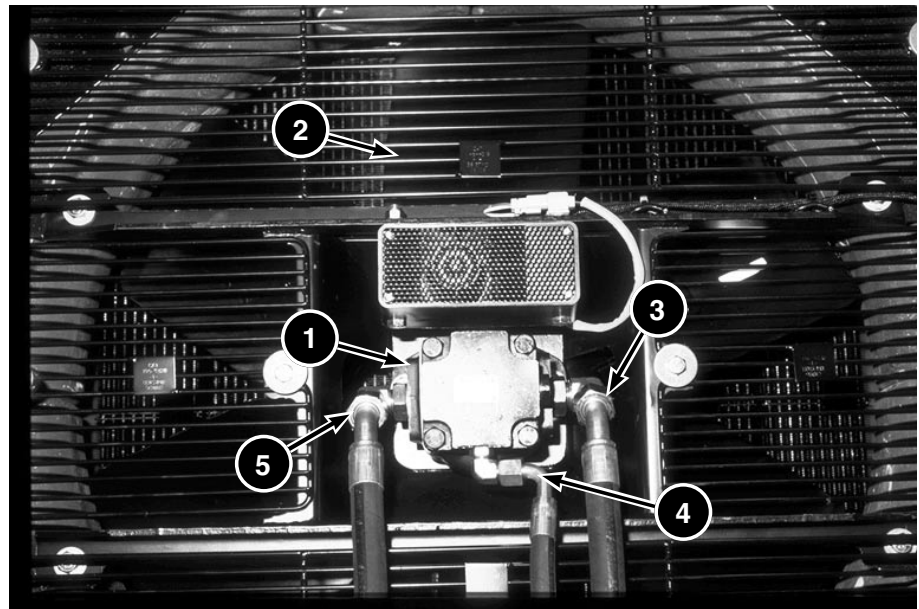


Fig. 3.3.4 Fan Drive Motor

Fan Drive Motor

The fan drive motor (1) is a gear-type motor driven by the flow from the fan drive pump. The fan drive motor turns a fan (2) that cools the oil in the hydraulic oil cooler and the engine coolant in the radiator.

Also shown are the fan drive motor inlet (3), the case drain outlet (4) and the fan drive motor outlet (5).

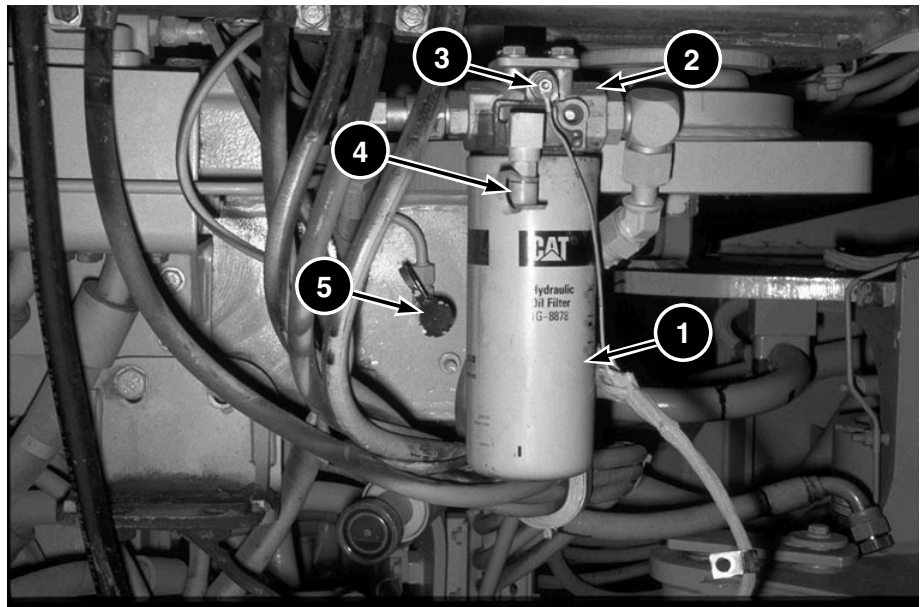


Fig. 3.3.5

The hydraulic oil filter (1) is located above the hydraulic tank on the right side of the machine. Oil flow from the hydraulic cooler or the hydraulic cooler bypass valve is directed to the filter before returning to the tank.

The filter is equipped with a bypass valve (2) and a bypass switch (3). The bypass valve allows the oil flow to bypass the filter in case of a restriction. The bypass switch sends a signal to the Caterpillar Monitoring System to inform the operator that the oil is bypassing the filter.

Also shown are the fluid sampling port (4) and the steering pump pressure tap (5).

NOTES

Lab 3.3.1: Fan Drive System Testing and Adjusting

Shop Lab Exercise

This lab measures your ability to perform the fan drive system tests and use proper methods to adjust the fan drive system.

Procedure:

Using the procedure in the 950G and 962G Wheel Loader Electro-Hydraulic System Testing and Adjusting (Form No. RENR2146) or 950G and 962G Wheel Loader and IT62G Integrated Toolcarrier Hydraulic System Testing and Adjusting (Form No. SENR1390), perform the fan drive system tests.

Record all test results on "Lab 3.3.1: Fan Drive System Testing and Adjusting Worksheet."

WARNING

To avoid possible personal injury, follow all warnings listed in the Service Manual module "950G and 962G Wheel Loaders Electro-Hydraulic System Testing and Adjusting" (Form No. RENR2146) or the Service Manual module "950G and 962G Wheel Loader and IT62G Integrated Toolcarrier Hydraulic System Testing and Adjusting" (Form No. SENR1390).

Materials Needed

Lab 3.3.1 Worksheet

950G and 962G Wheel Loader Electro-Hydraulic System Testing and Adjusting (Form No. RENR2146) or 950G and 962G Wheel Loader and IT62G Integrated Toolcarrier Hydraulic System Testing and Adjusting (Form No. SENR1390)

950G Wheel Loader

4C-4892 ORFS Fitting Group

9U-7400 Multitach

Mechanics tool box with hand tools

Lab 3.3.1: Fan Drive System Testing and Adjusting Worksheet

FAN DRIVE SYSTEM SPEED AND PRESSURE with AC		
	Fan Drive Supply Pressure	Fan Drive Motor Speed
Specifications		
Machine Readings		

FAN DRIVE SYSTEM SPEED AND PRESSURE without AC		
	Fan Drive Supply Pressure	Fan Drive Motor Speed
Specifications		
Machine Readings		

Which procedure should be performed if the speed of the fan drive motor or the pressure of the fan drive pump is not within specifications? (Circle the correct response)

1. Adjust the pressure relief valve
2. Replace the pressure relief valve

Why? (Explain the answer chosen)
