



**TX1134706-UN: Fan Drive Hydraulic System Schematic—Reversing (if equipped)**

**LEGEND:**

- 31 - Hydraulic Oil Tank
- 32 - Return Filter
- 34 - Filter Bypass
- 35 - Suction Screen
- 132 - Fan Drive Pump
- 133 - Fan Drive Motor
- 135 - Fan Speed and Reversing Control Valve (if equipped)
- 600 - High Pressure Oil
- 604 - Return Oil
- Y9 - Reversing Fan Solenoid
- Y5005 - Variable Speed Fan Solenoid

**Standard Hydraulic Fan Function**

See [Fan Drive Hydraulic System Schematic](#) . (Group 9025-15.)

See [Fan Drive System Component Location](#) . (Group 9025-15.)

A hydraulic-powered cooling fan is used to provide air flow for the machine's cooling package. The fan drive system consists of:

- Gear type fan drive pump (132)
- Fan speed control valve (134) or fan speed and reversing control valve (if equipped) (135)
- Gear type fan drive motor (133)

The fan drive pump is directly driven off the front gear train of the engine. Oil flow to the pump comes from the hydraulic oil tank (31). Return oil (604) from the fan drive motor is routed to the return filter (32) in the hydraulic oil tank.

The variable speed fan solenoid (Y5005) regulates oil flow and pressure buildup in the fan drive system. The more oil flow to the fan drive motor, the greater the fan speed. How much oil flow is routed to the fan drive motor, depends on the current applied to the fan speed solenoid valve from the engine control unit (ECU).

The ECU uses five parameters to control the current sent to the integrated variable speed fan solenoid. The engine coolant temperature sensor (B4), hydraulic oil temperature sensor (B40), charge air cooler outlet temperature sensor (B5205), fuel temperature sensor (B5), and ambient air temperature sensor (B22) send system temperatures to the ECU. Each temperature input calculates a desired fan speed, the maximum of the fan speeds is used as output to the fan speed control valve.

When machine systems are cold, the ECU sends maximum current to the variable speed fan solenoid. This shifts the solenoid valve, to allow most oil flow to be returned to the hydraulic oil tank and bypass the fan drive motor. The fan drive motor and cooling fan operate at a low speed.

As the machine warms up during operation, the ECU decreases the current to the fan speed solenoid valve. The decrease in current applied, causes the solenoid valve to shift and restrict oil flow through the fan speed solenoid valve, increasing oil flow to the fan drive motor. As oil flow to the fan drive motor increases, cooling fan speed increases.

When maximum cooling is required, the ECU supplies low current to the variable speed fan solenoid with the solenoid valve at a set minimum current, LOW VOLTAGE fan speed current, the fan drive motor and cooling fan operate at the set maximum speed of LOW VOLTAGE maximum speed. This controlled fan speed is more economical and fuel efficient. During a fan system malfunction or unplugged fan speed solenoid, the ECU supplies no current to the variable speed fan solenoid. With the solenoid valve de-energized, the variable speed fan solenoid is fully shifted to allow maximum oil flow to the fan drive motor. The fan drive motor and cooling fan operate at maximum speed.

### ***Reverse Fan Function—If Equipped***

The optional reversing function, reverses the cooling fan to help clean the machine cooling package of dirt and debris. The reversing function can be initiated manually by the operator, or automatically by the ECU. If set to reverse automatically, the ECU will reverse the fan at a preset interval.

For additional information, see [Reversing Fan Switch—If Equipped](#) . (Operator's Manual.)

The integrated fan speed and reversing control valve is used with the optional reverse fan function. The control valve controls both fan speed and reversing fan direction.

To start a reversing cycle, the ECU first increases current to the variable speed fan solenoid in the fan speed and reversing control valve. The engine control unit briefly applies maximum current to stop the fan, while the reversing fan solenoid valve (Y9) shifts to reverse oil flow. The ECU then removes current to the variable speed fan solenoid, to operate the fan at maximum speed in reverse for a short period of time. The ECU continues to calculate the desired speed for the fan forward inputs. After the reverse cycle completes, the ECU will return to the maximum desired speed. Returning to normal operation, the ECU briefly applies maximum current to the variable speed fan solenoid, while the reversing fan solenoid resets to normal operation.