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## PRODUCT INFORMATION

**FI-89**

July 2000

File: Caterpillar

### Operation of Air-Fuel Ratio Control With Hydraulic Override

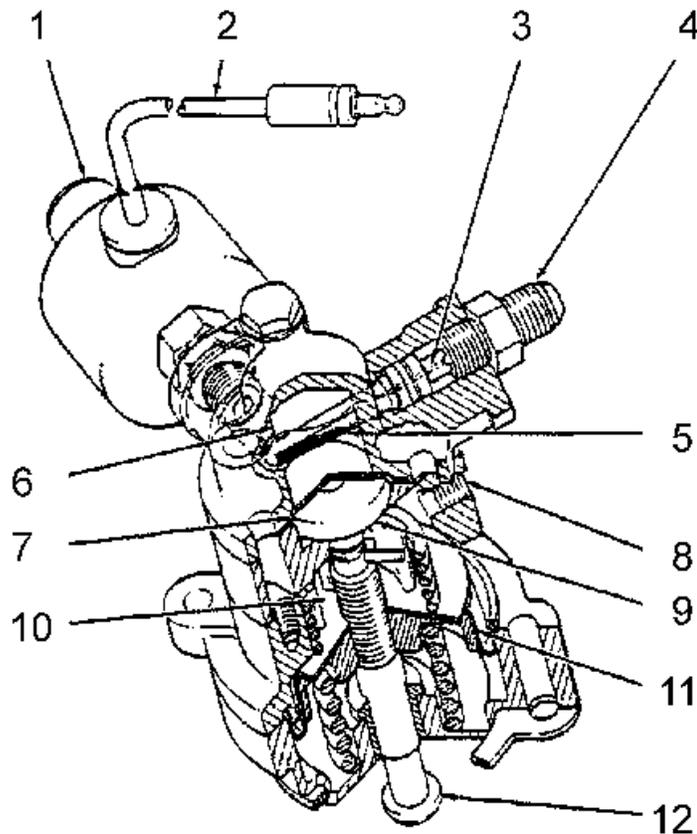
We have received numerous inquiries regarding the operation of the air-fuel ratio control with hydraulic override in Caterpillar sleeve metering fuel system applications. Following is a description of the system operation.

The air-fuel ratio control limits the amount of fuel to the cylinders during an increase of engine speed to reduce exhaust smoke. The hydraulic override allows a maximum amount of fuel to the cylinders to start the engine.

The bolt (12) in the air-fuel ratio control limits travel of the fuel control shaft in the FUEL ON direction only. As the engine accelerates, the fuel control shaft makes contact with the bolt (12) and will not go to the full fuel position. When the turbocharger gives enough air pressure to provide good combustion in the cylinders, the inlet manifold pressure goes through a line to the air inlet (8) into the air chamber (10). The air pressure in the air chamber (10) pushes on the diaphragm (11), which moves the bolt (12) down. When the bolt (12) moves down, the fuel control shaft can move to the full fuel position.

The solenoid wire (2) is connected to the start terminal of the starter switch. When the solenoid is activated by the starter switch, oil from the rear of the right cylinder head goes through the solenoid (1) to the oil chamber (6). Oil pressure in the oil chamber (6) pushes on the diaphragm (7) and the plunger (9), which move the bolt (12) down. The fuel control shaft can now go to the full fuel position for easier starting.

After the engine starts and the starter switch is released, the solenoid (1) closes and stops oil flow to the oil chamber (6). Oil in the oil chamber (6) goes through the screen (5), the orifice (3), and the fitting (4). Oil now goes through a tube and drains into the left cylinder head. With no oil pressure in



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