

## Brake System Operation

### Hydraulic "Wet Disc" Brakes

This system begins with hydraulic tank flow to a dedicated pump on the left front side of the engine. The pump sends flow through a high pressure filter and through a check valve, on to an accumulator charge valve. The accumulator charge valve sends fluid either to a pair of accumulators (to build up charge pressure) or to the brake cooling ports on the way back to the hydraulic tank. If the pressure of the accumulators is below 1850 psi, flow goes to charge these accumulators. If the accumulator pressure reaches 2350, the flow goes back to tank.

The accumulator supply lasts about 10 - 15 brake applications before the pump recharges them.

The foot brake is a variable pressure reducing valve which takes the charge pressure in the accumulators and transmits modulated pressure to the brakes, going through a shuttle valve on the way. The maximum pressure coming out of this brake valve is 900 psi for the L80F, (which can be increased). The service brakes are a wet-disc clutch style brake, which take pressure to engage, and have pressure bleed off to disengage. (The max allowed brake seal pressure is 1600 psi). Under hard braking, the brakes may squeal somewhat, which is normal.

The parking brake is a "spring applied-hydraulic release" Caliper/Disc unit mounted on the drive line at the axle pinion.

Pressure is tapped off of the accumulator line to supply flow to a pressure reducing valve, which limits the down-stream pressure to 1500 psi. A four way solenoid valve directs this supply to the parking brake caliper when this solenoid is energized, allowing the machine to move. The other passage in this solenoid valve allows the

parking pressure to bleed off the service (wet disc) brakes, which are also to hold the machine when it's parked.

Whenever the solenoid valve is "off" (parking brake engaged) the pressure from the pressure reducer goes to the wet disc brakes, shifting the shuttle valve along the way.

The parking brake caliper, at the same time has its holding pressure dumped back to tank, and the spring in this brake applies clamping force to the disc.

Over a period of time, the accumulator charge pressure may bleed off through the four way solenoid valve spool. A pilot to open check valve is in the line to hold wet disc brake pressure in. This valve opens when pressure is sent on to the parking brake.

A warning light and horn on the dash signals the operator if the accumulators are under 1700 psi. It's normal for this light to come on when starting the machine, but it should go off in under 20 seconds. If this warning light stays on, there is a problem in the charge circuit, and the system needs to be checked over.

The wet disc brakes receive cooling from the hydraulic oil going back to tank. The oil goes back through a dual return filter (with a 8 psi bypass setting) before returning to tank. A check valve at the tank allows these filters to be changed with a minimal loss of fluid.

**CAUTION:** Always bleed off the accumulator charge pressure before working on the brake system.

# Hydraulic "Wet Disc" Brake Schematic

