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Pump Hydraulic System... M312, M315, M318 and M320 Excavators Hydraulic System Caterpillar

Usage:

[M318 6ES](#) [M312 6TL](#) [M320 6WL](#) [M315 7ML](#) [M318 8AL](#) [M318 8SS](#) [M320 9PS](#)



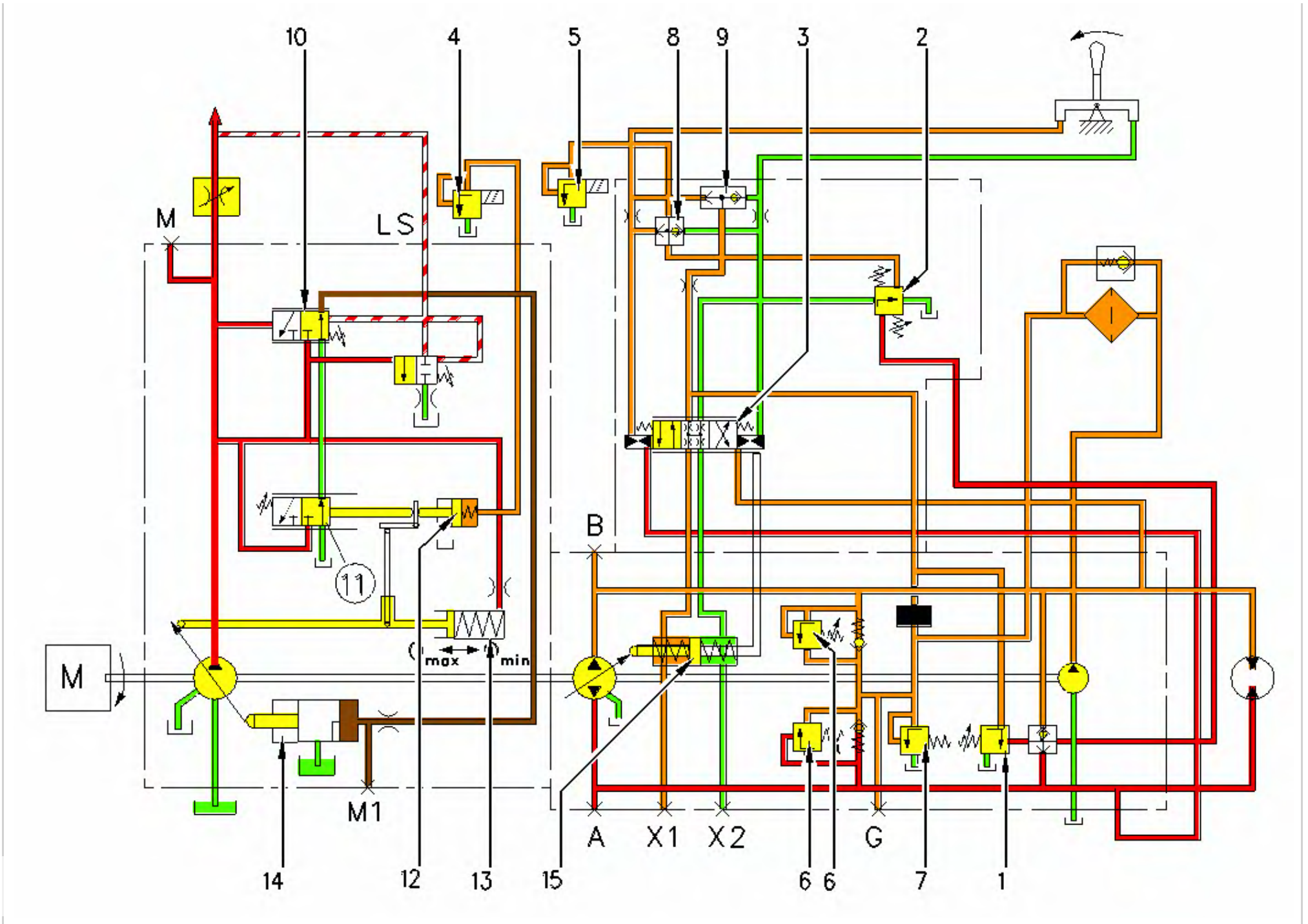
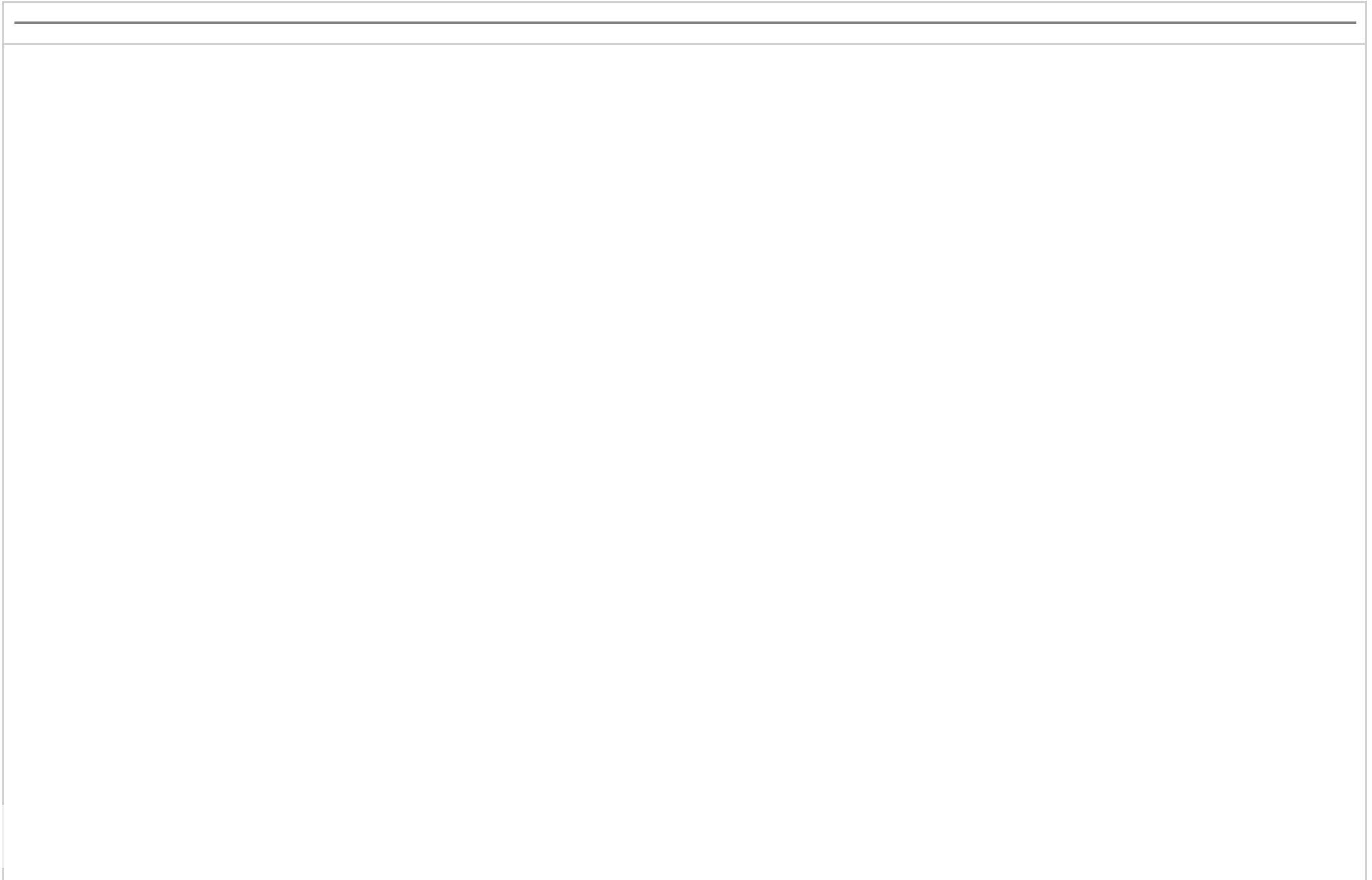


Illustration 1

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- (1) Cutoff valve
- (2) Brake valve
- (3) Control piston
- (4) Main pump PRV
- (5) Swing pump PRV
- (6) Crossover relief valve
- (7) Charge pressure relief valve
- (8) Shuttle valve for PRV
- (9) Shuttle valve for control pressure
- (10) Load sensing control
- (11) Horsepower control
- (12) Power shift pressure piston
- (13) Upstroke servo piston
- (14) Destroke servo piston
- (15) Servo piston
- (M) Main pump pressure
- (LS) Load sensing signal
- (M1) Control pressure
- (A) Swing pressure or charging pressure
- (B) Swing pressure or charging pressure
- (X1) Servo control pressure
- (X2) Servo control pressure

External Components



PUMP COMPONENTS

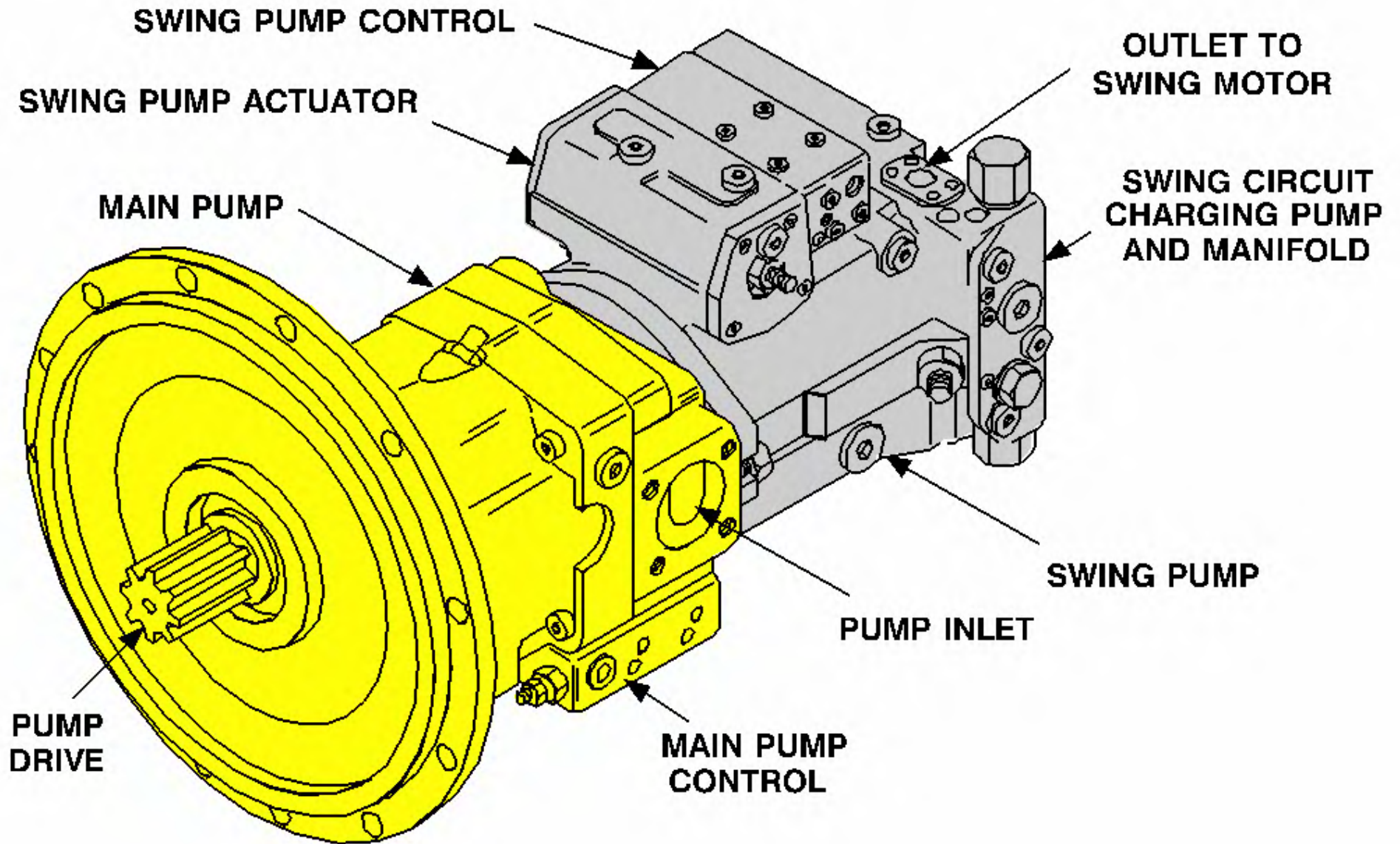


Illustration 2

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Illustration 2 shows the major external components of the main pump and swing pump. The pumps work independently of each other. Both of the pumps have separate locations for adjustments and procedures.

The main pump regulator is mounted below the pump case. The pump regulator consists of a load sensing spool (margin **spool**) and a horsepower **spool**. The M312 Excavator, M315 Excavator and M318 Excavator also have a load sensing **orifice** spool which maintains a minimum load sensing pressure.

The swing pump regulator is mounted above the swing pump case. Swing system pilot activation pressure is used to upstroke the swing pump.

Internal Components

PUMP GROUP COMPONENTS

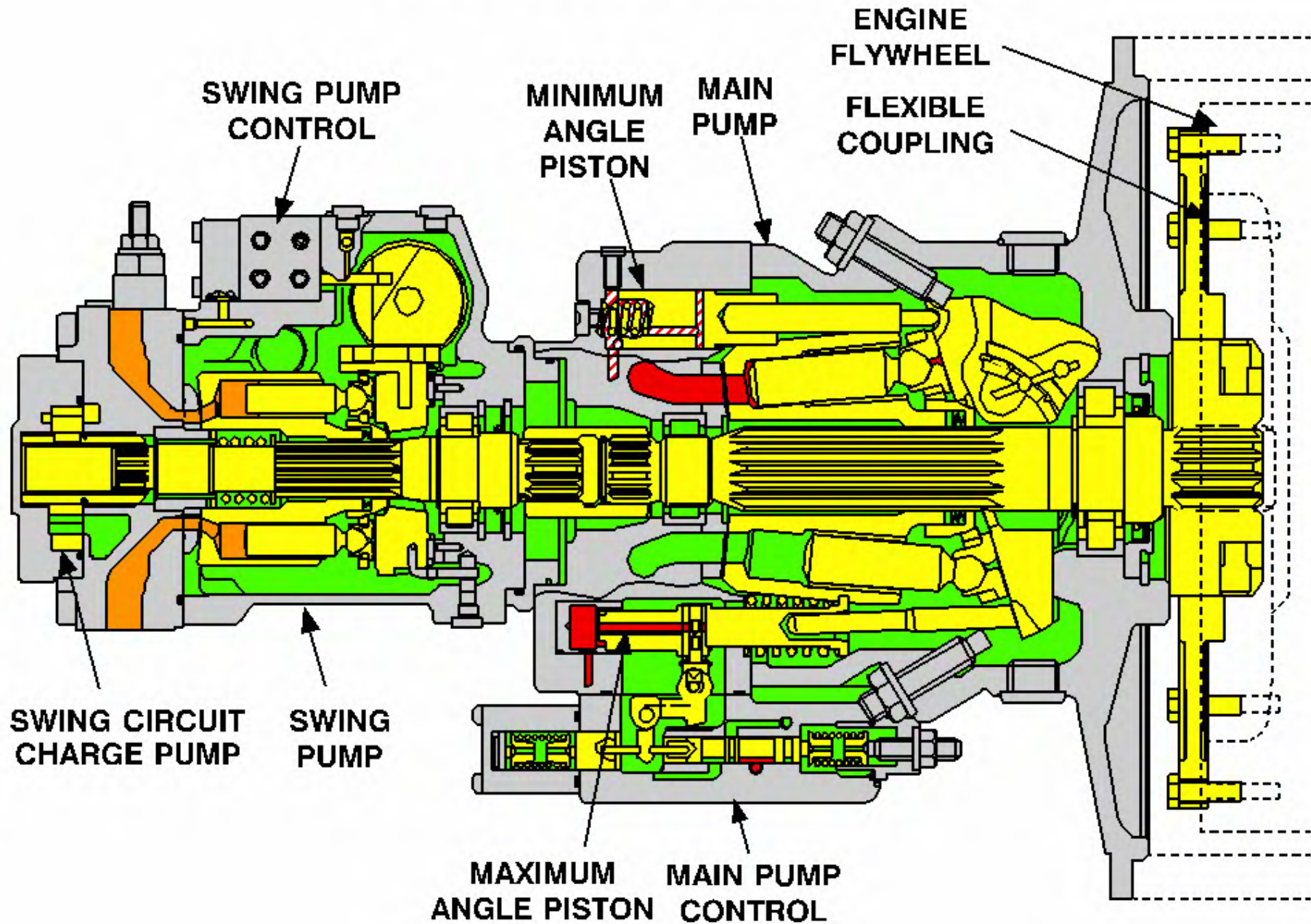


Illustration 3

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Illustration 3 shows the major internal components of the hydraulic pump. The front pump is the main pump for implement operation and for travel operation. The rear pump is an independent pump for swing operation. The swing circuit is charged by a gear pump that is driven by the swing pump. The front pump is driven off the engine flywheel through a flexible coupling. The swing pump is connected to the main pump drive shaft by using a spline coupling.

Each pump has a separate pump regulator that operates independently.

The main pump hydraulic flow control is based on the load sensing signal pressure from the main control valve in order to keep the margin pressure constant. Margin pressure is the difference between the pump delivery pressure and the load sensing pressure ("LS").

The swing pump flow and direction is controlled by the combination of the flow, the pressure, and the torque control.

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PARTS

Caterpillar

Case