



KNOWLEDGE BASE

Article Type: **Reference**

Blocking Valve – Slow Valve Summary

Description:

Reference information on “Blocking Valve” used on “all pumping units. Block machines, Cubers, PTS and RTS Handling systems, Splitters, UL.

WARNING

Never work on, clean or service this unit, control panel or any machine or open or remove any protective cover, guard, grate, door, or maintenance panel until the power or energy sources has been turned off, locked out / tagged out, and all moving parts have come to a complete stop and or blocked to prevent movement. Machinery is dangerous - avoid personal injury and or death by following manufacture, Local, and OHSa safety procedures. Contact Columbia Machine for safety decals, guards, horns and beacons.

Blocking/ Slow Valve Summary

Blocking Valve

The blocking valve provides the ability to immediately shut off the oil flow from the pump unit, isolating the hydraulic energy from the machinery. The blocking valve is closed when the power is turned off or when the safety circuit is not enabled. The safety circuit being not enabled occurs when switches or other items the safety circuit monitors are not enabled- meaning they are in an unsafe state.

The blocking valve circuit consists of a large pilot operated poppet valve cartridge (“Blocking Valve”, on the schematic). It is controlled by two (2) two-way solenoid operated valves (“Pilot Valve A” and “Pilot Valve B” on the schematic). The locations of these valves are stamped: “PILOT A” and PILOT B” on the manifold.

Hydraulic circuit operation to provide full flow oil to the machine:

Pilot valve A and B are both energized. Pilot pressure (via Pilot B) is blocked to the blocking valve, and the Blocking Valve pilot cavity is drained to tank (via Pilot A) allowing the blocking valve to open.

Hydraulic circuit operation to block all oil flow to the machine:

Pilot valve A and B are both de-energized. The pilot cavity is blocked from the tank port (via Pilot A), and pressure (from the pump and/or accumulator via Pilot B) is directed to the pilot cavity of the blocking valve, which closes it and blocks flow to the system.

Slow Valve

The slow valve provides the ability to run the equipment at a reduced speed in order to make observations or perform adjustments, maintenance or mold changes. The function is user selected and functions when the maintenance/ slow mode is enabled. This functionality is only available during manual operation and the reduced oil flow is not adjustable. Safety circuit monitoring is suspended in this mode therefore this functionality is intended for use only by specifically trained and authorized personnel.

Hydraulic circuit operation to provide reduced oil flow to the machine:

This circuit consists of a two-way solenoid valve (“Slow Speed” on the schematic) that when energized, bypasses the blocking valve and provides approximately 10% of normal flow to the system. When de-energized, the valve closes, stopping the 10% flow. The location of this valve is stamped: “SLOW SPEED” on the manifold.

Electrical Hardware

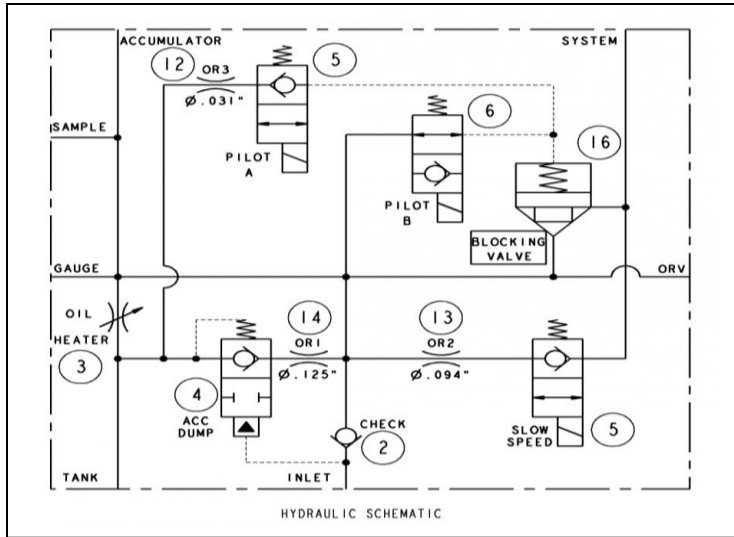
The three solenoid coils for these valves are not supplied on the Hydraulic Power Unit as they are voltage specific, and therefore are called out on the Electrical Assembly.

Columbia Part #'s for Coils are 4330770 (24 Volts), 4330776 (120 Volts), Coil Connector (332251)

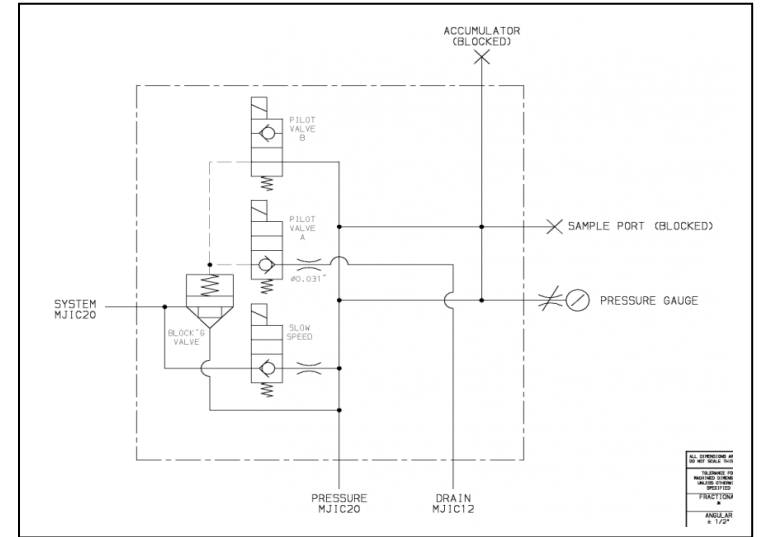
Blocking Valve and Slow Valve circuit truth table and explanation.

Operating Condition	Pilot Valve A	Pilot Valve B	Slow Speed Valve	Condition	Explanation
0	0	0	0	All Flow Blocked	Used to keep hydraulic energy isolated from the piece of machinery. a) Power is turned off b) Safety Circuit is not enabled
2	0	0	1	Slow Flow	Used during maintenance or mold change- specifically trained personnel only operating the machinery. a) Maintenance/slow mode enabled b) Manual operation only available c) Safety circuit monitoring suspended
n/a	0	1	0	DO NOT USE (Mostly blocked, leak to tank, will heat oil)	n/a
n/a	0	1	1	DO NOT USE (Slow flow, leak to tank, will heat oil)	n/a
n/a	1	0	0	DO NOT USE (Maybe blocked, piloted valve may not close)	n/a
n/a	1	0	1	DO NOT USE (Maybe slow flow, piloted valve may not close)	n/a
1	1	1	0	Full Flow	Used during manual or automatic normal operation. a) Pump is on b) Safety Circuit is enabled
n/a	1	1	1	DO NOT USE (May cause early slow valve orifice failure)	n/a

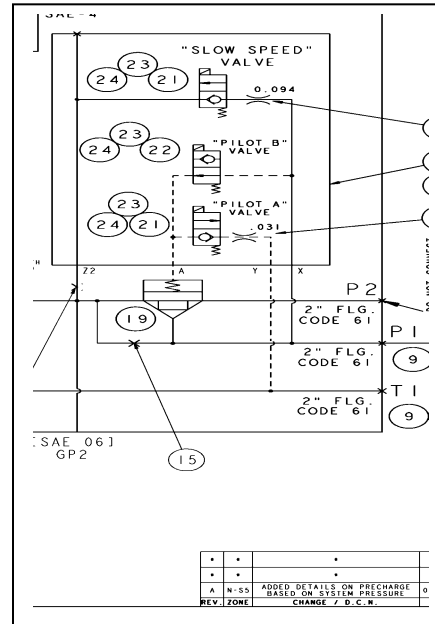
Single Pump Schematic (378.380.15, includes oil heater, and accumulator dump functions)

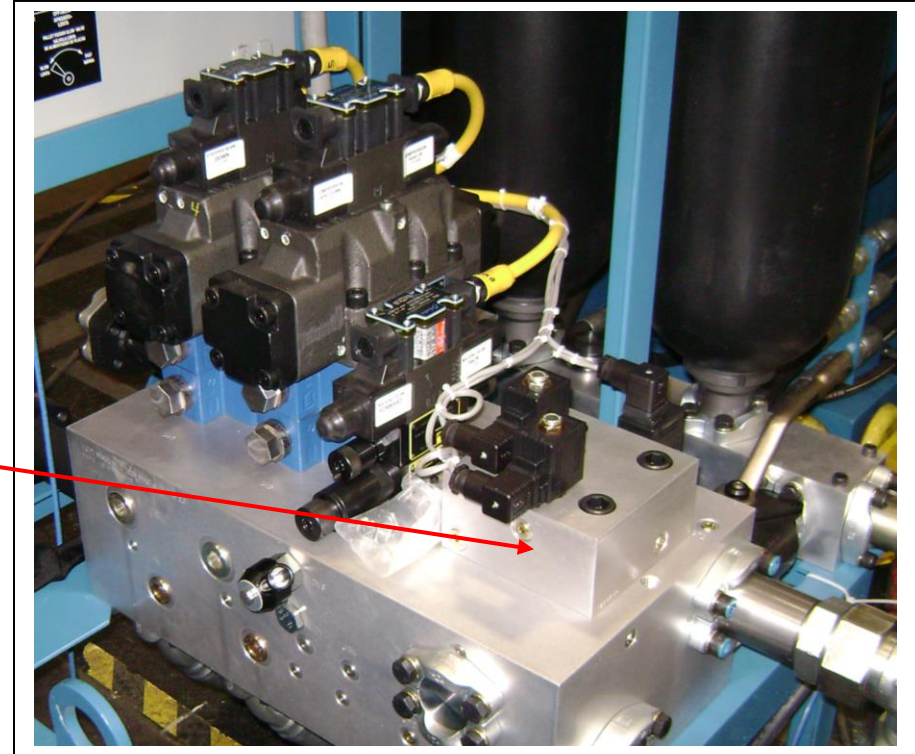
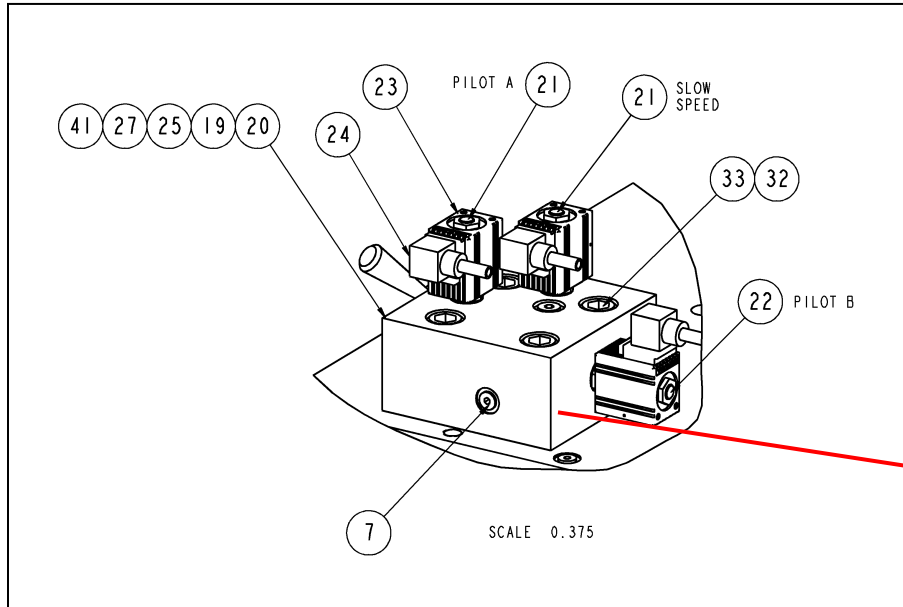


Single Supply Schematic (495.198.619, no oil heater or accumulator dump)



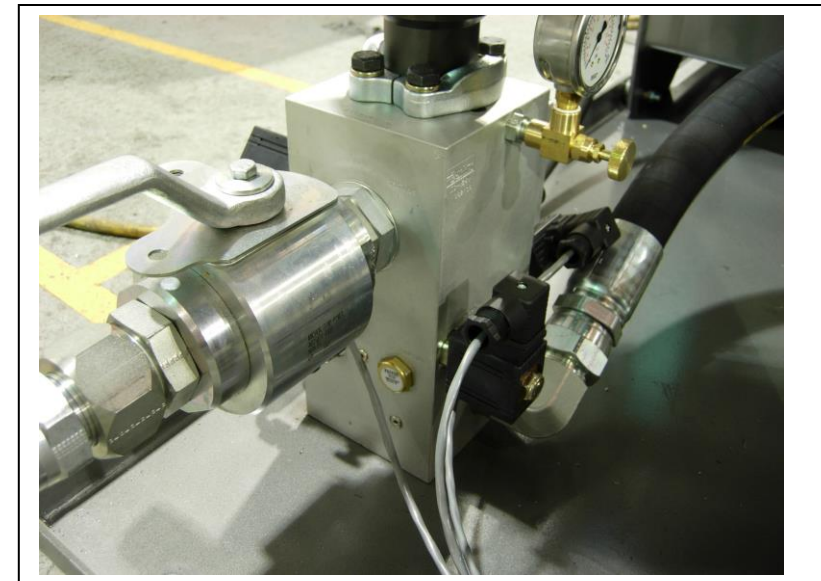
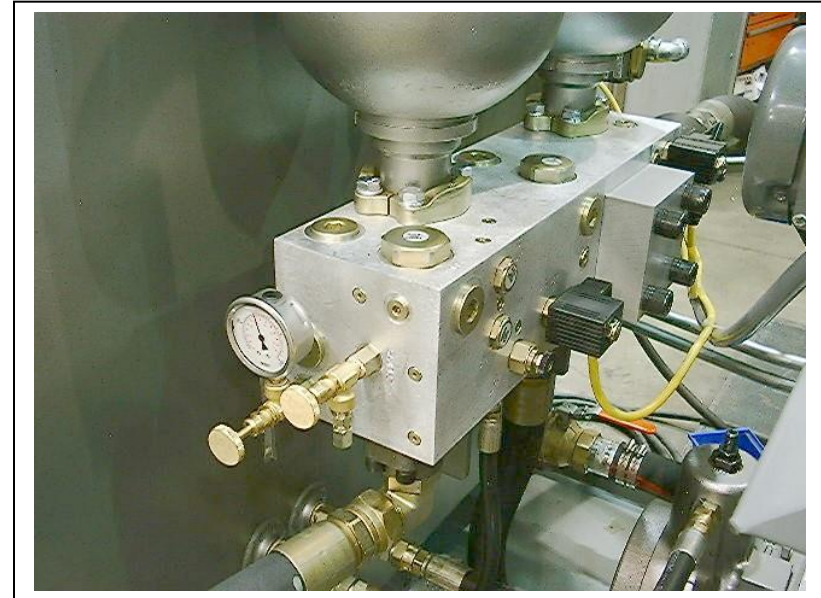
HYD ASSY VA, STAND W/BLOCKING VALVE #675.758.3





Slow valve manifold and valves. For your specific controls reference The hydraulics in the equipment parts manual.

Blocking valves for both CPM valve stand manifold & blocking valves on pumping units are shown above.



EXAMPLES: PUMPING UNITS WITH BLOCKING VALVE

Model 22, 16, 1600 Block machines and Cuber, Splitter 1224, UL systems, PTS Handling equipment, and other blocking valve mounted directly to the pumping unit as shown above.