



Overview - VMC - Hydraulic Counterbalance

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Overview

The counterbalance system uses a hydraulic cylinder and internal piston assembly to support the weight of the spindle head and relieve the load on the axis motor-drive system. The piston is pressurized continuously on one side [2], while the other side is open to the atmosphere. The pressurized side of the cylinder is filled with hydraulic oil from a tank [1] mounted on the column of the machine. The cylinder is fixed to the column casting next to the ballscrew. A bracket [3] attaches the cylinder rod to the spindle head casting .

The hydraulic oil is cycled from the tank [1] to the cylinder [2] when the spindle head moves up [B] and down [A]. As the spindle head is moved to the bottom of travel [A] , the tank pressure increases because the effective volume is decreased as it fills with oil. When the spindle head is moved to the top of travel [B], the tank pressure decreases because the effective volume is increased as it fills with gas.

