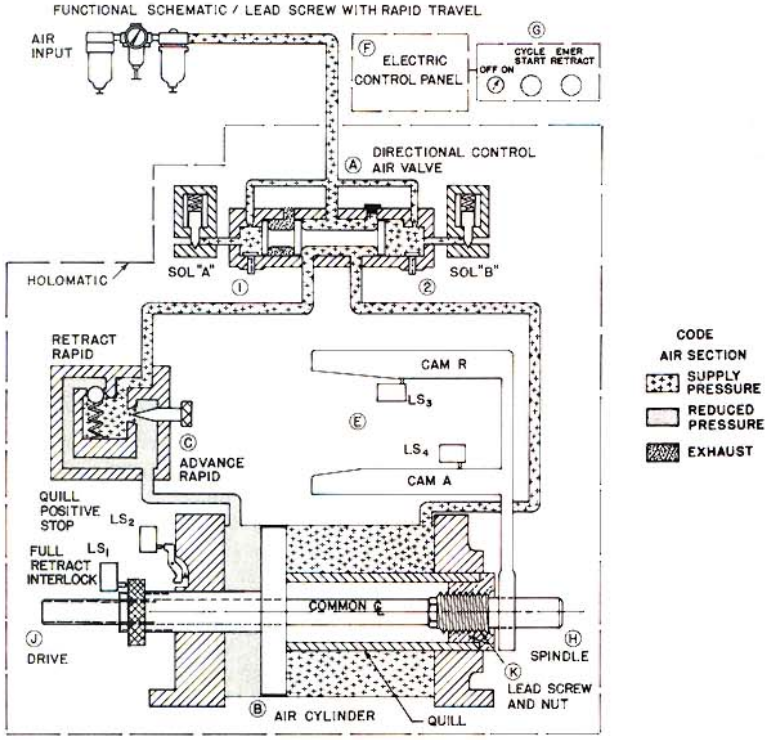
HAUSE MACHINES
MONTPELIER, OHIO 43543

SERIES A3 OPERATING PRINCIPLE

Lead Screw Holomatic Power Feed Units With Quill Rapid Travel

FUNCTIONAL SCHEMATIC / LEAD SCREW WITH RAPID TRAVEL



SEQUENCE OF OPERATION

The illustration shows Holomatic Quill advancing in rapid motion. Electric Circuit selector switch is ON.

The Cycle Start button at Ⓖ has been momentarily depressed which energized Solenoid "A" at Directional Control Air Valve Ⓐ. Solenoid "A" valve opened which dropped the air pressure at that end of spool. The higher pressure at opposite end caused spool to shift to position shown. Air is being admitted to Drive end of Air Cylinder Ⓑ thru Advance Rapid valve Ⓒ. The thrust developed on larger piston area of Drive end has overcome constant air pressure retract thrust on Spindle end, and LS_1 has been released. The Quill will continue to advance in rapid motion until it reaches Quill Positive Stop Ⓓ. The Quill Positive Stop Ⓓ will operate LS_2 starting drive motor rotating Spindle Ⓗ forward. The lead screw on Spindle will turn thru nut on Quill advancing Spindle. As Spindle advances, LS_3 is released; when Spindle reaches depth setting, LS_4 is operated and drive motor reverses. When Spindle feeds back to its starting position, LS_3 is operated, simultaneously plugging motor to a stop and momentarily energizing Solenoid "B". Opening Solenoid "B" valve will cause the spool of Directional Control Air Valve Ⓐ to return to its original position. Air will then be exhausted from Drive end of Air Cylinder, and Quill will retract releasing LS_2. LS_1 will be actuated as Quill reaches full retract position.

Depressing Emergency Retract button will interrupt the cycle and cause Spindle and Quill to return to fully retracted position in normal sequence.

A no-hole or broken tap condition will force Quill to move back releasing LS_2 which will stop motor.

COMPONENT FUNCTION

Ⓐ DIRECTIONAL CONTROL AIR VALVE directs air to and from Drive end of the Air Cylinder.

Ⓑ AIR CYLINDER, double acting with area differential, develops thrust power for quill stroke action. (Air is applied continuously to Spindle end of Cylinder.)

Ⓒ ADVANCE RAPID CONTROL meters air flow to Drive end of Air Cylinder to establish advance rapid travel rate.

Ⓓ QUILL POSITIVE STOP provides adjustable limit of quill rapid advance distance and operates Limit Switch LS_2.

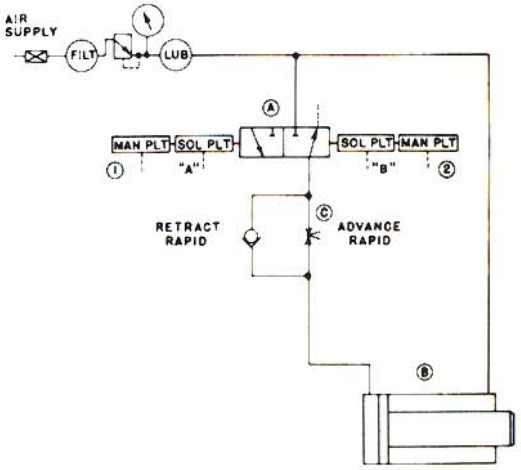
Ⓔ STROKE CONTROL monitors position of Quill and Spindle.
- Cam A – Adjusts thread deapth.
- Cam R – Adjusts spindle start position.
- LS_1 – Indicates full retract position.
- LS_2 – Indicates advance limit of Quill.
- LS_3 – Indicates spindle start position.
- LS_4 – Indicates thread depth setting.

Ⓕ ELECTRIC CONTROL PANEL provides electric power in proper sequence for unit cycling and motor starting, reversing and plug stopping.

Ⓖ PUSH BUTTON STATION provides manual controls for cycle actuation and emergency retract.

Ⓗ SPINDLE moves with Quill and mounts tools and tool holders.

Ⓙ DRIVE incorporates a telescoping spline to transfer the rotational power of a motor to the Spindle.

Ⓚ LEAD SCREW AND NUT develops spindle feed at thread pitch rate after quill advance rapid movement

GRAPHICAL DIAGRAM