FESTO PNEUMATIC VALVE #1

This valve could be used to port high pressure air to one end of an actuator and exhaust it to atmosphere from the other end. It could be used to move a piston rod back and forth or lock it into position. The slashes in the small rectangles at the ends of the valve indicate that it is solenoid activated. The triangles at the ends indicate that the valve is pilot operated. This means that the solenoids create pathways for pressure that move a small piston or spool and the motion of the spool creates pathways for flow to an actuator or some other device. The zig-zag lines indicate that springs are used to return valve to the center or neutral position when both solenoids are deactivated. When the left solenoid is activated, flow paths in left block slide over to middle block and line up with high and low pressure ports. When the right solenoid is activated, flow paths in right block slide over to middle block and line up with high and low pressure ports. The small rectangles with the overhanging ends means valve can be manually adjusted with setscrew.

MYH-5/3G-M5-L-LED

#1

0997

2....8bar

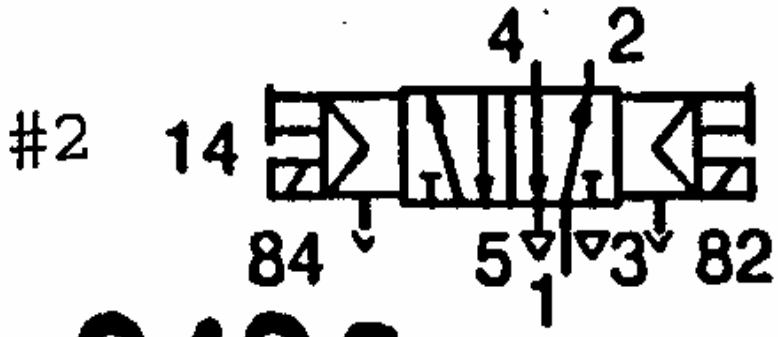
34311

FESTO

FESTO PNEUMATIC VALVE #2

This valve could be used to move a piston rod back and forth but it cannot lock the rod into position. It does not have a neutral position. When the left solenoid is activated while the right solenoid is deactivated, flow paths in left block slide to the right and line up with high and low pressure ports. When the right solenoid is activated while the left solenoid is deactivated, flow paths in right block line up with high and low pressure ports. If only one solenoid was activated and it was then deactivated, flow paths would not change. During solenoid deactivation the solenoid pilot pressure would be vented. This would make the net load on the flow spool due to its two end pressures zero. In this case, flow paths would be held in place by friction.

JMYH-5/2-M5-L-LED



0496

2....8bar

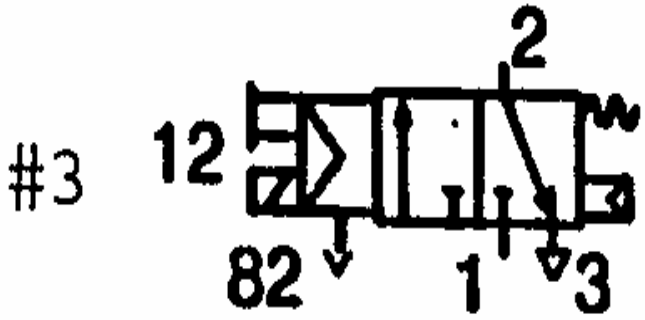
34310

FESTO

FESTO PNEUMATIC VALVE #3

This valve could be used to port high pressure air to the pressure end of an actuator with a spring return. When the solenoid in not activated, flow path is as shown in sketch: the pressure end of the actuator is connected to atmosphere. When the solenoid is activated, flow path on left slides to the right and connects the pressure end of the actuator to high pressure. This pushes back or compresses the spring and extends the piston rod. When the solenoid is deactivated, the valve spring causes flow paths on right to slide back into position. This vents the pressure end of the actuator to atmosphere and the spring within the actuator retracts the piston rod.

MYH-3-M5-L-LED



1297

2....8bar

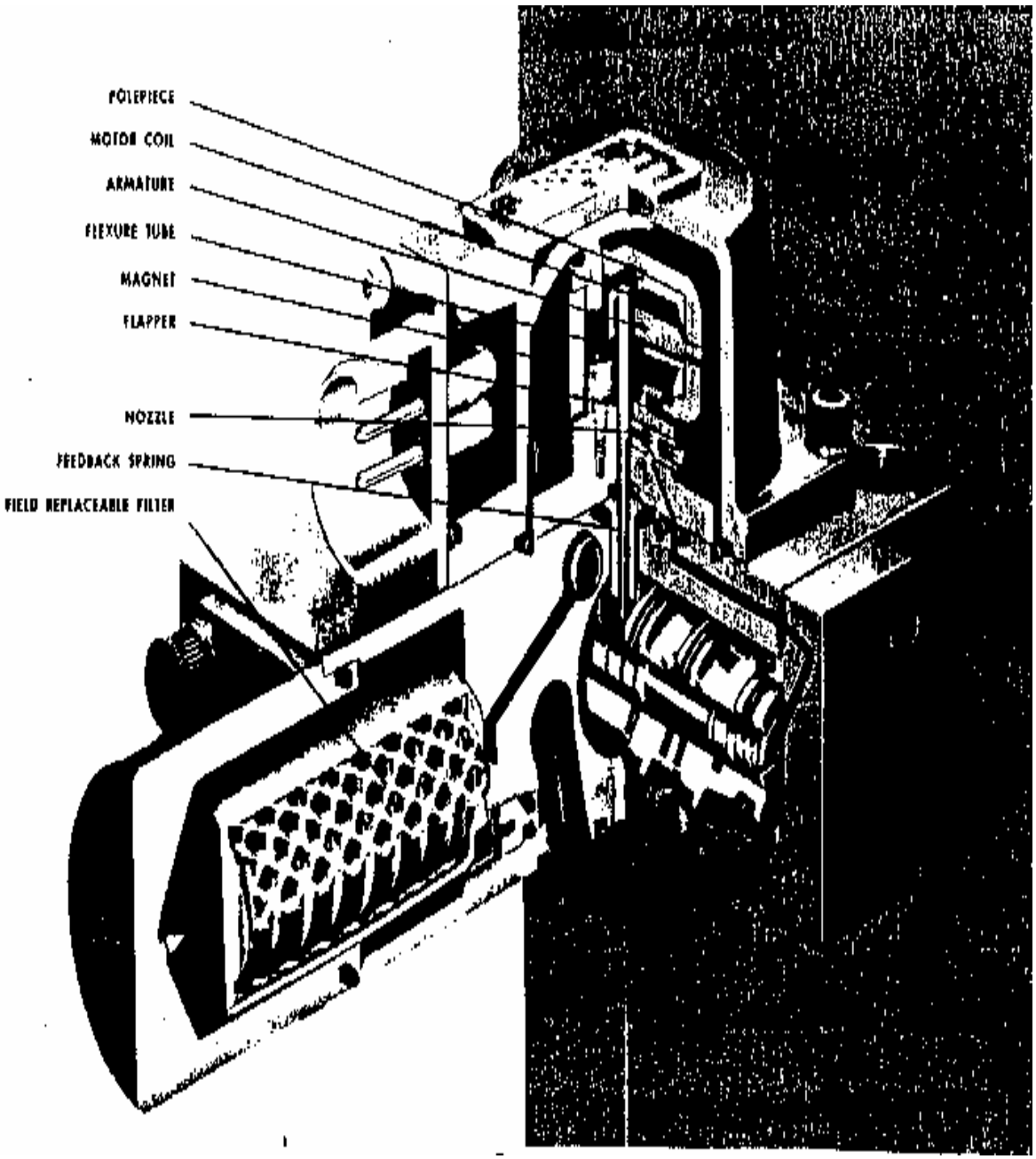
34307

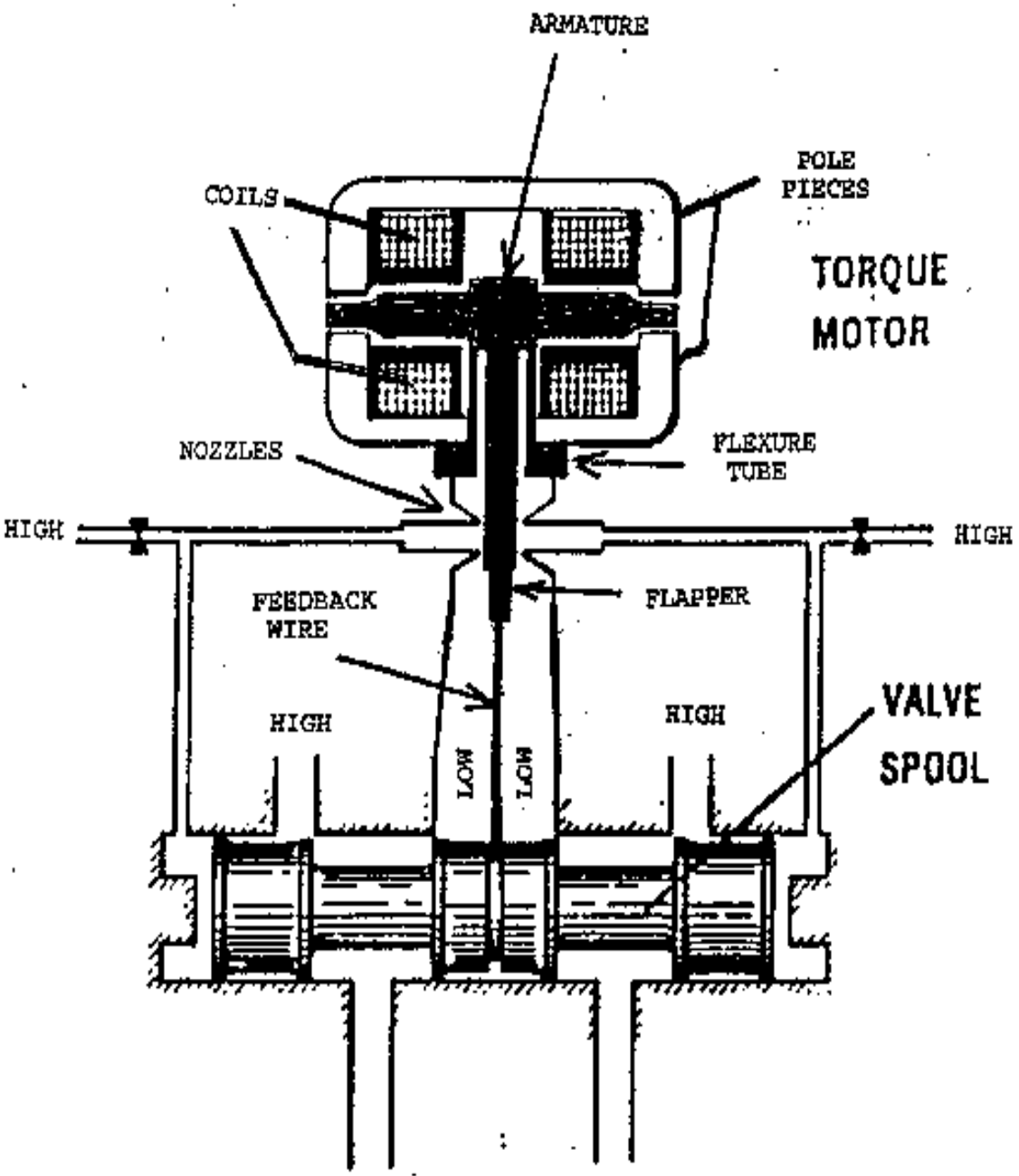
FESTO

MOOG HYDRAULIC SERVOVALVE

A servovalve consists of two main parts: an electrical part and a hydraulic part. The two parts are separated by something called a flexure tube. The hydraulic part is connected to a supply of high pressure oil and to a low pressure sump. The supply and sump pressures are both approximately constant. Two vertical permanent magnets positioned front and back make one pole piece a north pole and another pole piece a south pole. The control signal energizes a set of copper wire coils. The magnetic field set up by the coils is such that it causes one end of an iron armature to become a north pole and the other end to become a south pole. The north end of the armature is attracted to the south pole piece while its south end is attracted to the north pole piece. This generates a torque which causes the armature, which is supported by the flexure tube, to rotate slightly either clockwise or counterclockwise, depending on the polarity of the control signal. The amount of rotation depends on the magnitude of the control signal. As the armature rotates, a flapper attached to it moves laterally and modulates the flow areas of two nozzles, making one larger and the other smaller.

This causes flow through one nozzle to increase and flow through the other nozzle to decrease. As these flows move through fixed hydraulic resistors upstream, one causes pressure to increase on one end of a spool while the other causes pressure to decrease on the other end of the spool. This causes the spool to move. As it moves, a flexible feedback wire exerts an opposing torque on the armature, which tends to recenter the flapper. The spool moves until the flapper is basically recentered, and the pressure difference from one end of the spool to the other is the small amount needed to balance the feedback wire force. So, for any level of control signal, there is a corresponding spool position which is dependent only on the magnitude and the polarity of the signal. The spool connects the actuator lines to the supply of high pressure oil and the low pressure sump. It creates a flow passageway between them. Flow into the actuator is controlled by the size of this passageway. When the control signal is constant, flow is constant and the actuator rod moves at a constant speed. When the control signal is made a function of rod position error, the rod moves towards a target or command position.


POLEPIECE
MOTOR COIL
ARMATURE
FLEXURE TUBE
MAGNET
FLAPPER
NOZZLE
FEEDBACK SPRING
FIELD REPLACEABLE FILTER


ARMATURE
COILS
POLE PIECES
TORQUE MOTOR
NOZZLES
FLEXURE TUBE
HIGH
HIGH
FEEDBACK WIRE
FLAPPER
HIGH
HIGH
LOW
LOW
VALVE SPOOL
LINES TO ACTUATOR