



BVA[®]
HYDRAULICS





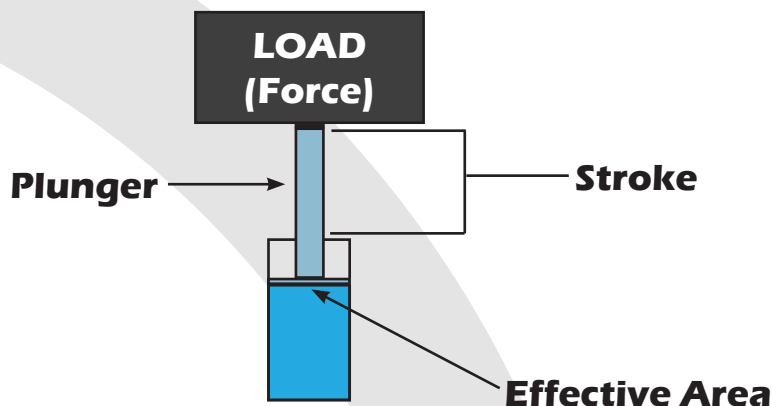
TABLE OF CONTENTS

Basic Hydraulic Principles	3
Basic Systems Set-ups	4
Valve Function	5
Pressure Adjustment	6





Basic Hydraulic Principles



Pressure: Resistance to flow as measured in psi

Effective Area: $0.7854 \times d^2$

Force: Load applied in lbf



$$P = \frac{F}{A} ; F = PA$$

V = Cylinder plunger speed in seconds per inch

A = Cylinder Effective Area

Q = Pump oil flow (in³)

$$V = \frac{A}{Q}$$

Choosing the Right Cylinder

1. Determining the cylinder's force capacity:

$$\text{Force (Lbs.)} = \text{Effective Area (in}^2\text{)} \times \text{Pressure from Pump (Lbs./ in}^2\text{)}$$

2. Determining oil capacity:

$$\text{Oil Capacity (in}^3\text{)} = \text{Effective Area (in}^2\text{)} \times \text{Cylinder Stroke (in)}$$

3. Determining the reservoir capacity for multiple cylinder systems:

$$\text{Usable Oil Capacity} = \text{Usable Oil of Cylinder} \times \text{Number of Cylinders}$$



Basic Systems Set-ups

Single Push Application

Single Acting
Cylinder

H1006

CH38M
Male Coupler

CS3814
6' Hydraulic Hose

GW4014 Pres-
sure Gauge

CF3814
Gauge Adaptor

P1000
Hand Pump

Single Acting Cylinder with longer strokes



H1010

CH38M
Male Coupler

CS3814
6' Hydraulic Hose

GW4014
Pressure Gauge

CF3814
Gauge Adaptor

PA1500
Foot Pump

Double Acting Cylinder Set-up

CH38M
Male Coupler

CS3814
6' Hydraulic Hose

GW4014
Pressure Gauge

PE0501T
Electric Pump

CVN3
Needle Valve

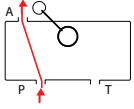
CF3814
Gauge Adaptor

Valve Function

Single Acting Cylinders

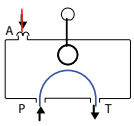
use 3 way valves

Extend-



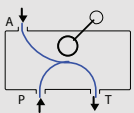
The oil flows from the pump (P) to the cylinder (A). The plunger will extend.

Hold-



The oil flows from the pump (P) to the tank (T). The cylinder port (A) is closed. The plunger will maintain its position.

Retract-

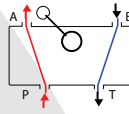


The oil flows from the pump (P) and the cylinder (A) to the tank (T). The plunger will retract.

Double Acting Cylinders

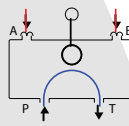
use 4 way valves

Extend-



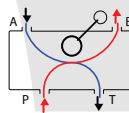
The oil flows from the pump (P) to the cylinder (A), and from the cylinder (B) to the tank (T). The plunger will extend.

Hold-



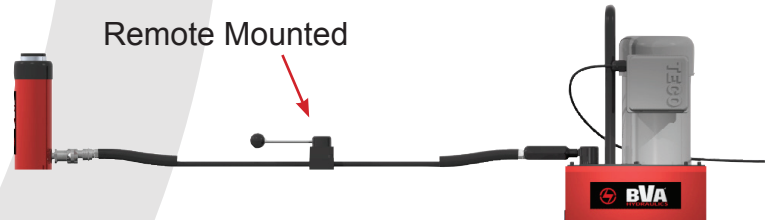
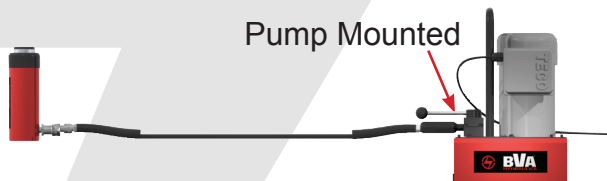
The oil flows from the pump (P) to the tank (T). The cylinder ports A and B are closed. The plunger will maintain its position.

Retract-

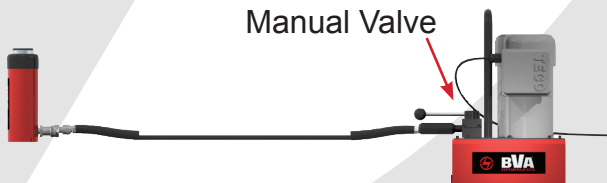


The oil flows from the pump (P) to the cylinder (A) and from the cylinder to the tank (T). The plunger will retract.

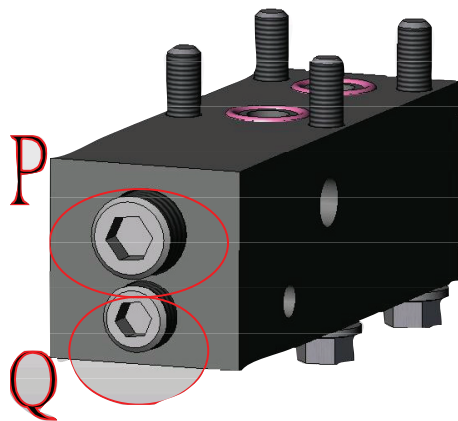
Examples of pump mounted and remote mounted



Examples of manual and solenoid valves



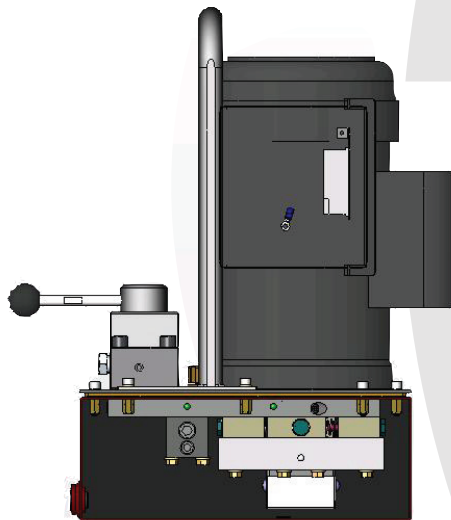
Pressure Adjustment



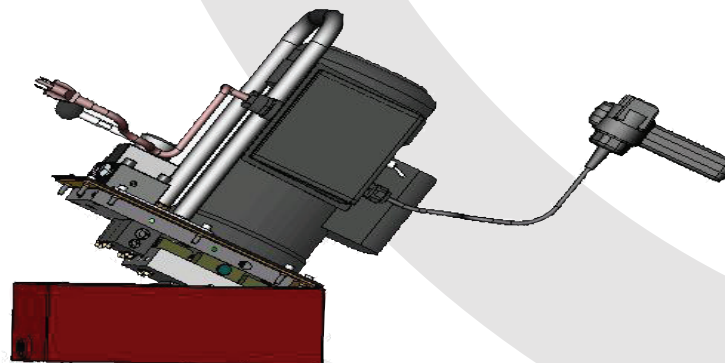
P: Low Pressure Adjust Valve
Q: High Pressure Adjust Valve

* Q is the screw that you need to adjust.
 (Use a 8mm or 5/16" Allen Wrench.)

Clockwise: Pressure increase
Counter-clockwise: Pressure decrease



Put the control valve lever in center position and make sure motor is off when making adjustment.



Instruction on how to change the valve from 4-way 3 position to 3-way 3 position

Remove 4 bolts on the **top manifold** and lift off the manifold vertically

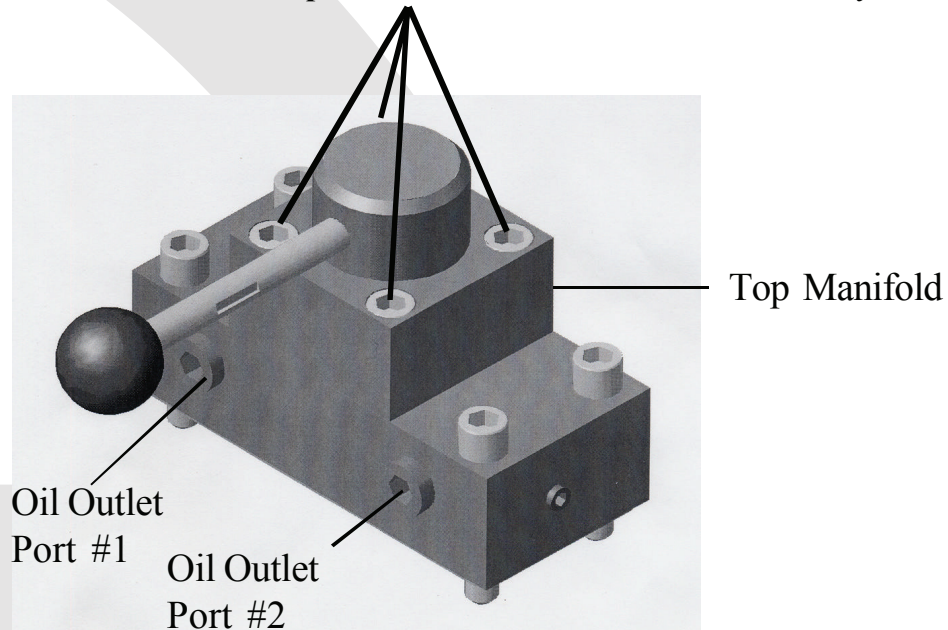


Figure 1

Pump is originally ship with **4-way** configuration as shown, these valves (#1 & 2) determine the function of the pump.

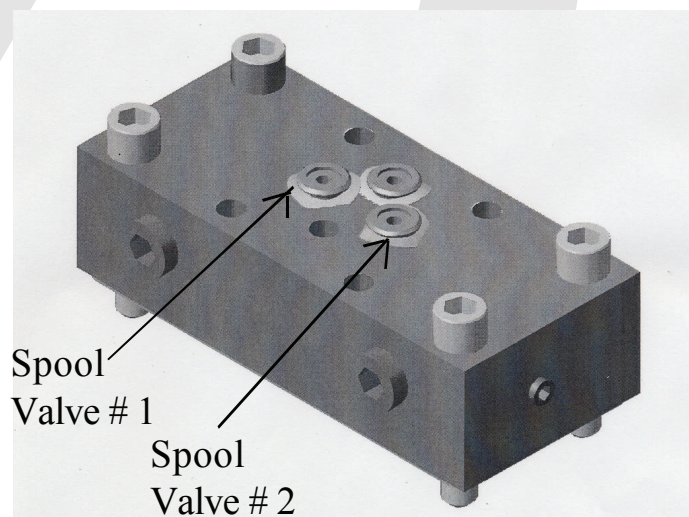


Figure 2

IMPORTANT!! Secure this port with provided hex. bolt after you removed spool valve # 2.

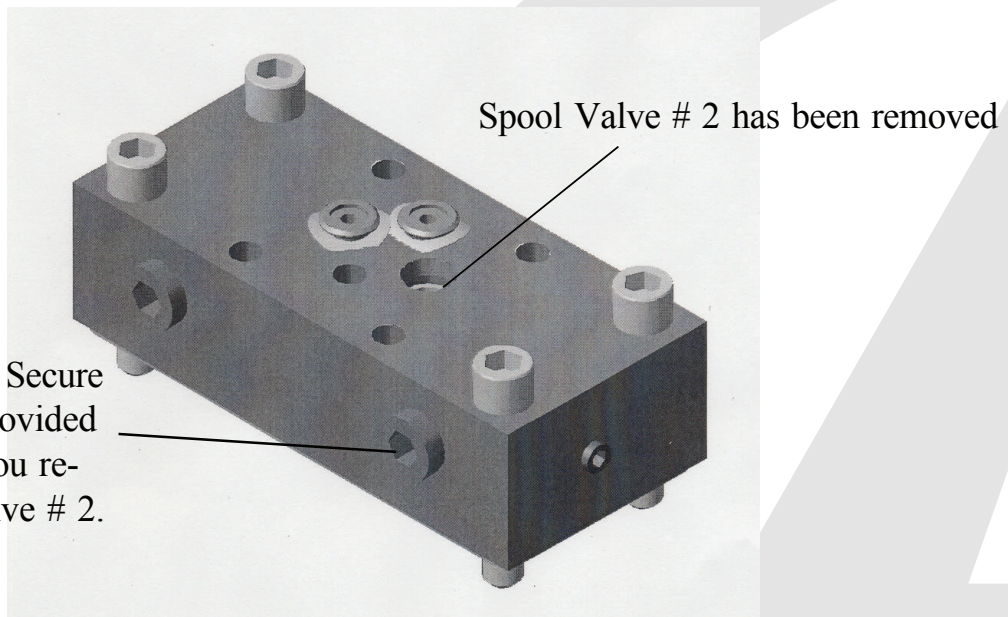


Figure 3

- * Add plug on side you removed valve
- This configuration is 3-way (for S/A Cylinder) for the oil outlet port # 1

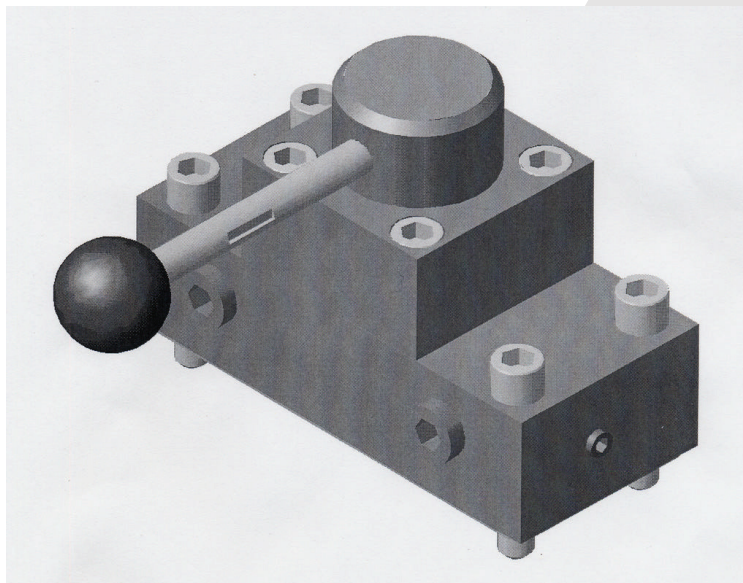


Figure 4

Finally, replace the top manifold and secure all 4 bolts. Make sure the gasket was aligned properly.