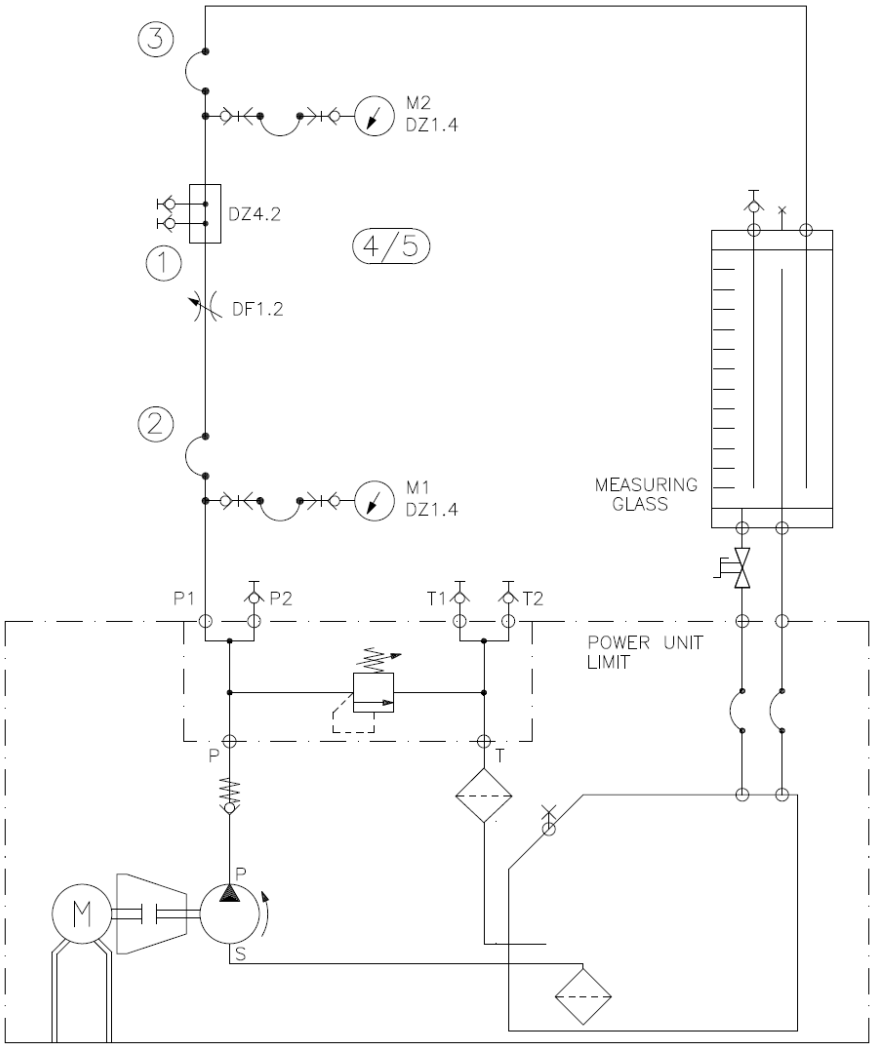
Pressure

Fundamentals:
Contrary to popular belief pumps create flow in the hydraulic system and not pressure. Pressure is caused by the resistance to this flow and this resistance could be from loads on actuators or artificial loads caused within the system itself. These artificial loads could be pressures caused by flow across valving or even the piping network.

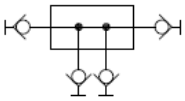
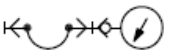
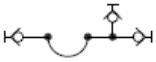
Objective: Determine the cause of pressure buildup in hydraulic systems.

Connections:
Utilizing the schematic below as a guide follow these steps to connect a circuit on the hydraulic trainer.

1) Connect the line mounted throttle valve 'DF1.2' to the connection piece 'DZ4.2'
2) Using a hose c/w gauge connector, connect from 'P1' to the throttle valve 'DF1.2'
3) Using a hose c/w gauge connector, connect from the connection piece 'DZ4.2' to one connection of the measuring glass
4) Mount two pressure gauges 'DZ1.4' on the mounting grid where they can be easily read
5) Connect the capillary hoses of the pressure gauges:
   Gauge 'M1' to the gauging point connector on the upstream side of the throttle valve DF1.2
   Gauge 'M2" to the gauging point connector on the downstream side of the connection piece DZ4.2



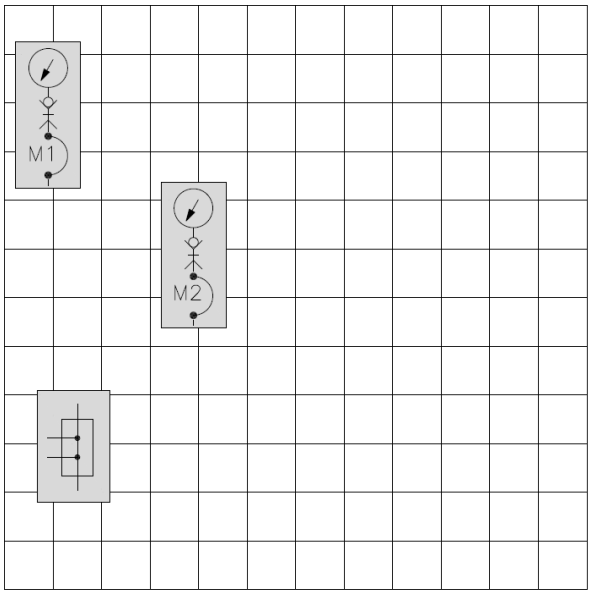
Components:
You will require the following components:

1x	Connection piece DZ4.2		2x	Pressure gauge DZ1.4	
2x	Pressure hose c/w gauge connection		1X	Throttle valve DF1.2	

Before beginning the experiment read the **Rules for hydraulic trainer operation** sheet.

Mount the components on the grid and connect them according to the schematic

Layout



Instructions
Utilizing the installed pressure gauges determine the effect of the throttle valve setting on the pressure in the hydraulic system.

Procedure

Steps in the experimental procedure:

1. Has your instructor checked the constructed circuit?
2. Check again that all connection hoses are firmly coupled. (pull/turn to test)
3. Ensure the red E-STOP button is not engaged on either of the starters. (rotate the button to reset)
4. Open the shut-off valve on the bottom of the measuring glass to enable the glass to drain.
5. Open the throttle valve DF1.2 completely (fully CCW)
6. Switch on the pump via the green START push button.

a) Measure the pressure at gauges 'M1' and 'M2' with throttle valve DF1.2 fully open and record them in the following table.
b) Slowly close off the throttle valve until you read a pressure of 200 psi at gauge M1
c) Record in the chart the pressure you now read at M2
d) Close the throttle valve DF1.2 by ½ turn increments and measure and record the resultant pressures at M1 and M2 in the following table

Turns	fully open	\	close by ½ turn	close by ½ turn	close by ½ turn	close by ½ turn	close by ½ turn	close by ½ turn
p M1 (psi)		200 psi						
p M2 (psi)								

Table 1

e) Close the throttle valve completely and note what you see at the pressure gauges and the flow to the measuring glass. Explain.

M1 = _____ psi M2 = _____ psi Flow: ☐ yes ☐ no

f) When complete switch off the pump via the red STOP push button

Conclusions:

1) Resistance to flow in the hydraulic circuit produces _____

2) Even with the flow control valve backed out completely there is still some _____