

# **Fluid Power Controls Laboratory**

## **(MechE 458)**

### *Safety Precautions*

1. Dress appropriately
2. Do not wear ties or other loose pieces of clothing that can get stuck in fast moving equipment
3. Do not wear clothes that you would mind getting dirty / oily
4. Roll up sleeves if necessary
5. Remove jewelry on your hands / wrist
6. Make sure that ALL hoses are properly connected before turning on the pump. Flying hoses are the major hazard in this lab
7. Beware of squirting fluid when releasing pressure in the hoses / components. An eye wash is available
8. Get a TA or person in charge to scrutinize your circuits before you start your pump
9. Hydraulic oil should NOT be ingested
10. No eating or drinking in the lab - campus safety policy! Keep food in your bags and drinks closed
11. While using actuators, motors or other components with moving parts, stand clear before turning on the pump
12. Keep fingers away from places where they may be pinched. The hydraulic pump operates at very high pressure (up to 500psi)
13. Keep the workbench tidy. Make sure that there are no dangling hoses that make cause a component to drop on somebody's toes

### Hydraulic work bench startup procedure

1. Switch the "emergency switch" to off.
2. Turn the switch at the pump to the "on" position.
3. Double check the circuit is properly connected - listen for the "click" for every connection. Pull the hoses to double check.
4. Now you are ready....
5. Switch the "emergency switch" to on

### Hydraulic work bench switch off procedure

1. Switch the emergency switch to off
2. Unless you will run an experiment in the next 10 minutes, turn the switch at the pump to off also
3. Make sure that BOTH the emergency switch and the pump switch are off when you leave the lab.
4. When you are done: disconnect your circuits, let the hoses drain on the workbench and Put away the components

### Precautions when using electronic sensors

1. The pressure sensors are rated for **1000** psi. Although the hydraulic pump has a built in relief valve set to 500 psi, pressure spikes in excess of 1000 psi can occur if the pump is started with an open circuit. Ensure that at least one path in the circuit is fully open before starting the pump.
2. The electronic flow meter is **unidirectional**. Care should be taken to ensure it is **never** placed in a position where **reverse flow** is possible.
3. The position sensor on the actuator should never be powered with voltages  $> 5V$

**KEEP THE LABORATORY TIDY!**