Class #3

Valves and Simple Circuit Analysis
Notes

• Video Captures Online
• Moodle for Grades
• Revision Opportunity: Lab 2
  – Due 1 Week After Returned
• Upcoming Labs:
  – Lab 5: Relief Valves (Direct & Pilot Operated)
  – Lab 6: Meter-in / Meter-out Circuits
Agenda

• Hydraulic Circuits:
  – Series
  – Parallel

• Electrical Analogs:
  – Check Valves

• Flow Control Circuits
  – Meter-In/Out
  – Bleed-Off

• Cartridge Valves
Hydraulic Circuits: Single Valve
Circuits: Series
Circuits: Parallel
Electrical Analogs
Meter-In Circuit

Find:
1. Cylinder pressure, \( P \)
2. Flow rate out of the cylinder, \( Q_{out} \)
3. Circuit efficiency
Meter-Out Circuit
Bleed-Off Circuit
Check Valves

- Allows flow only one direction
- Main uses are:
  - by-pass components
  - cylinder locking
Pilot Operated (open) Check Valve

- Allows reverse flow when pilot pressure is turned on
- Enables cylinder locking
- Consider force balance to calculate what pressures needed to open the check
Cartridge Valves

• Assemble Components into Circuits in a Manifold
  – Manifold = metal block with internal passages
Cartridge Valves (screw in)

- Check Valve
- Pilot Operated Check Valve
Cartridge Valve (Screw In)

- Relief Valve
- Pilot Operated Relief Valve
Two Minute Writing

- ½ Sheet of Paper
- No Names

1. What have you found most interesting thus far?
2. What have you found most confusing/challenging thus far?