



Getting Started with Hydraulics

GSH

Topical Outline

1. GSH course introduction and learning objectives
2. Overview of a hydraulic powered machine
3. The ‘strength’ of hydraulic-powered equipment
4. Introduction to hydraulic power units and the basic components of a hydraulic power unit
5. What is a hydraulic cylinder and what does it do?
 - Types available and basic construction
6. What is a hydraulic motor and what does it do?
7. Basic construction and operation of hydraulic pumps
 - Fixed and variable displacement
 - Discussion of various pumping groups
8. Understanding fluid pressure
 - How its created, how its controlled, function it serves in the system
9. Understanding Directional control valve function, operation, sizes, and spool options
10. How can cylinder speed or hydraulic motor speed be controlled?
 - Flow control valves – meter-in vs. meter-out
 - A variable flow pumps
11. What is “load control”/“counterbalance”? Why might load control be necessary?
12. What is “load holding”? Why might load holding be necessary?
 - Understand the operation of pilot operated check valves
13. What is a pressure reducing/regulating valve? How does it work? Why is it used?
14. Hands-on lab exercises to reinforce class lecture and discussion
15. Live demonstrations, graphical handouts, hydraulic symbol library for student reference, cutaway components all for the purpose of reinforcing classroom lecture and discussion
16. Classroom sessions reading and interpreting a hydraulic schematic
17. Practice sessions – hydraulic symbol recognition and understanding valve functions and operation that is represented by a fluid power symbol – ongoing throughout the course
18. Student questions, discussion, and assessment