engineering adventures

Worksheet IH1 & Training Record Introduction to Hydraulics		Explore Hydraulics
Email:	Course:	Provider:

Expected Outcomes: (60-120mins)

To know examples of how where and why fluid power, hydraulic equipment is used.
To appreciate why hydraulic, pneumatic or electrical system would be used.
To understand the basic hydraulic components and how they are combined in circuits.

Previous Knowledge Required:

No previous knowledge is required. Students already working with hydraulic equipment including hydraulic pumps, actuators and control valves etc. may not require this worksheet.

Certificate of Achievement:

Click the email button (shown left, that will appear within each app) to post your results, once the training module has been completed. Enter your email or the email for your external training provider.

Interactive tutorial

Complete the 'Introduction to Hydraulics' tutorial at
www.e4training.com/hydraulic_courses/tutorial1.php
(or via the phone app or CD/download)
Complete quick quiz at end and post results.

Date, score & time:

Tick when posted ☐

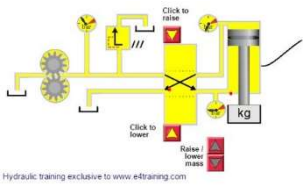
Coursework investigations

Look at the examples of where hydraulic equipment is used at www.e4training.com/hyd01/ & /hyd02/
Write down all the uses of hydraulics you see around you through the course of a typical week.

Complete ☐

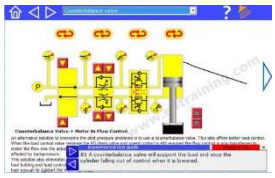
Consider the reasons why pneumatic, hydraulic, or electrical drive systems are used.
See www.e4training.com/hyd_newbie/compare1.php

Complete ☐



Study the 'Basic Components' information and video at
www.e4training.com/hyd_newbie/basic_comp1.php
Understand what functions pumps, directional valves, cylinders, and relief valves perform.
Understand how hydraulic components are combined into a circuit to drive machines.

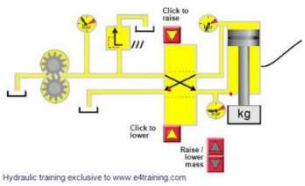
Complete ☐



Study the 'Basic Hydraulic Control Circuit' information and video at
www.e4training.com/hyd_newbie/basic_circ1.php
Understand that flow control valves control the speed control and check valve can be used to stop the load from falling.

Complete ☐

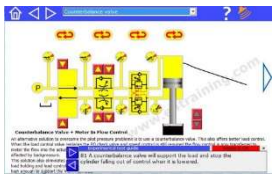
Interactive experiments



Experiment with the 'Basic Circuit Component' simulation at
www.e4training.com/hyd_newbie/basic_comp3.php

- Click the valve solenoids to drive the cylinder up and down.
- Observe how changing the cylinder load affects the pressure.
- Discuss when and why the safety relief valve opens.

Date, score & time: Tick when posted ☐



Experiment with the 'Directional Valve Circuit' simulation at
www.e4training.com/hyd_newbie/basic_circ3.php

- Observe how the cylinder falls with only one directional valve.
- Select drop down box 2 (ddb2). Observe how cylinder can fall dangerously with nothing to control it.
- Select ddb3. Observe how the flow control valves control the speeds of the cylinder. Discuss what happens if you change the size of the orifice restriction.
- Select ddb4. Observe how the pilot operated check valve protects the cylinder from gradually falling.
- Discuss what happens with different loads on the cylinder and different valve combinations.
- Discuss the implications of not controlling the load properly.

Quiz date & score Tick when posted ☐

Coursework assignments

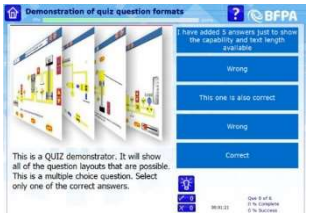
Complete the following coursework

- Write a list of applications that use fluid power.
- Write down examples of where electric and pneumatic drives are used and explain why they were selected instead of hydraulics in each case.
- Write a list of components you typically find in a hydraulic circuit and explain their function.
- Draw a simple circuit including a speed control valve and a valve to hold the cylinder steady when the power is turned off.

Number of sheets emailed

Complete ☐

Interactive quiz



Complete the 'Introduction to hydraulics' Quiz module at
https://www.e4training.com/hydraulic_test1.php
(or via the phone app or CD/download)
Click email button to post results when complete.

Quiz name, date, score

Tick when posted ☐

And Finally:

Complete this worksheet and keep for your records. Submit the written coursework to e4training.com or your training course provider. Application result postings will be collated automatically by the course provider; e4training.com will also receive a copy of the results to include in the certificate assessment process.

Related Worksheets:

Visit www.e4training.com/hydraulic_courses/worksheets1.php to find the next worksheets related to your course.