

Teacher Planning Sheet Demo_Trial		Hydraulic Training
Hydraulic training content example		
Email:	Course:	Provider:

Aims:

This example teachers' lesson plan shows the typical format and content. Demo links are free to try.

Duration: 45 to 60 minutes.

Objectives:

1. To follow a typical e4training.com teacher's lesson plan.
2. To see examples of knowledge-based information including text, graphics, videos, and tutorials.
3. To operate a component on a virtual hydraulic test rig and follow the sample exercise experiments.
4. Explore the hydraulic circuit simulator and work through typical exercises.

Previous Knowledge Required:

No previous knowledge required or subscription payment.

Materials needed:

Laptop computer, tablet, chrome book with access to the internet. Or smartphone if others are not available. LRS/LMS endpoint address and keys.

Terminology:

Pressure relief, safety valve, thermal relief, direct-acting, pilot-operated (PO), Pressure reducing, load limiting valve.

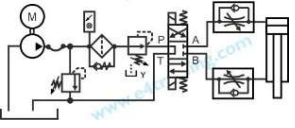
Bellwork - early bird activity

Ask students to think about how a pressure relief valve might work? Draw the symbol and ask them to draft out designs for how the physical valve might be achieved in practice. Hint: start with a ball bearing covering a hole.

Generate subject interest

Today you will learn to read a new international language with no alphabet!

Hydraulic Circuit Symbols
Symbols are based on ISO 1219-1 and 2



Hydraulic circuits are explained by combining symbols together to form a single diagram. This 'language' is the same all around the world and is defined by one international standard.

For example, circuits see [hyd_princip/hydraulic_symbols5.php](http://www.e4training.com/hyd_princip/hydraulic_symbols5.php)

Time: 10 minutes

Example lesson content summary

Watch an **introduction to hydraulics tutorial** at hydraulic_courses/intro_to_hyd1.php



- Complete the 'Introduction to Hydraulics' tutorial and take the quick quiz at the end to reinforce your understanding.

Time: 10 minutes

Pressure relief valve functions at [/hydraulic_valves/relief1.php](http://hydraulic_valves/relief1.php)

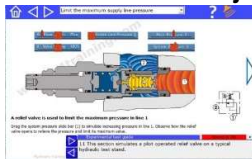


Use the webpage text, images, and video to highlight:

- The uses of pressure relief valves e.g. safety, unloading.
- Simple function with pressure lifting a poppet or spool against a spring.
- Basic ball or quality spools give different costs and quality.

Time: 15 minutes

Adjust a pilot-operated relief valve at [/hydraulic_valves/relief3.php](http://hydraulic_valves/relief3.php)



- Follow the suggested exercises and observations below the simulation.
- Adjust the valve's settings and observe how the pressures change.
- Adjust the flow rate and observe how the pressures change.

Time: 15 minutes

Safety relief valve circuit at www.e4training.com/simulate/simulate1.php

Experiment with the pressure relief valve in the 'simple cylinder circuit':



- Operate the cylinder and observe when the relief valve opens.
- Click on the relief valve to change its setting and observe how the power input changes.
- Change the pump flow rate and plot how the actual line pressure varies.

Time: 15 minutes

Practical & coursework exercises



Ask your local hydraulics company for an old directional and check valve that students can take apart to examine the components inside.

Time: 10 minutes

Information and extended reading resources for teachers and students

Covered by e4training.com website modules HP03, HI01, HV05, &HC01

Quiz questions at www.e4training.com/hydraulic_test1.php? Quiz - Hydraulics part 1

Instructional videos can be found on page 2 of each section.

Additional classroom or homework resource see www.e4training.com/teachers/

Question and answer sheets.

Related teacher lesson plans.

Key questions / Plenary

Can you explain what pressure relief valves do?

Can you describe 3 different applications where pressure relief are used and explain why?

Can you draw a pressure relief valve symbol?

Learning Record Store:



Click the mail icon to post your results, once training is complete. Students must enter their unique username and the school's LRS endpoint details.

See www.e4training.com/xapi/ for an explanation of result meanings.

Ticket out: 3-2-1 Activity:

3. Record three things he or she learned from the lesson.

2. Record two things that they found interesting and that they'd like to learn more about.

1. Record one question they still have about the material

Special needs adaption:

All web pages are configured for Google translate, font resizing, and screen reader operation. This app does not currently include instructions in other languages or spoken guidance.

Additional Course Worksheets:

See also self-study lesson plans at www.e4training.com/hydraulic_courses/courses1.php

Notes