

## Self-Study Worksheet Demo\_Trial Pressure Relief Valve Basics

## Hydraulic Components

Email:

Course:

Provider:

Learning Objectives/Expected Outcomes: (30-60 mins)

1. To follow a typical e4training.com self-study lesson plan.
2. To see examples of knowledge-based information including text, graphics, videos, and byte size 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.

Terminology:

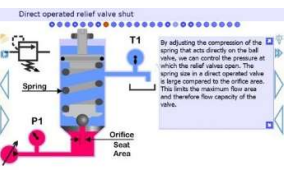
Pressure relief valve, safety valve, thermal relief valve, direct-acting relief, pilot operated (PO) relief.

Record of Achievement:



Click the mail icon to post your results, once training is complete. Result data is compatible with all LRS/LMS systems. See [www.e4training.com/xapi/](http://www.e4training.com/xapi/) for an explanation example LRS options. Also record progress, times, scores, etc. on this training record sheet and keep together with any additional written work or sample calculations.

*Interactive presentation and quick quiz*



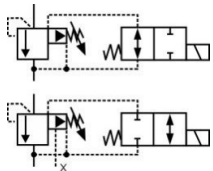
By adjusting the compression of the spring that acts directly on the ball valve, we can control the pressure at which the relief valve opens. The spring size in a direct operated valve is large compared to the orifice area. This limits the maximum flow area and therefore flow capacity of the valve.

Complete the 'Introduction to Hydraulics' tutorial at [www.e4training.com/hydraulic\\_courses/intro\\_to\\_hyd1.php](http://www.e4training.com/hydraulic_courses/intro_to_hyd1.php)

Complete the quick quiz at the end to reinforce understanding.

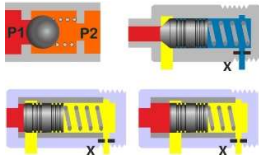
**Date, score & time:** Tick when posted

*Coursework investigations*



Recognise the different pressure control valve symbols and appreciate what each symbol feature represents at [/hyd\\_princip/hydraulic\\_symbols5.php](http://hyd_princip/hydraulic_symbols5.php)

**Dates & durations:** Complete



Study the detailed information and watch the instructional videos at

[/hydraulic\\_valves/relief1.php](/hydraulic_valves/relief1.php) & [/hydraulic\\_valves/relief2.php](/hydraulic_valves/relief2.php)

Key points:

- Limit or control the maximum line pressure.
- Required over-pressure protection safety device.
- Can be direct-acting or pilot operated.
- Many different build quality and design types available.

Dates & durations:

Complete



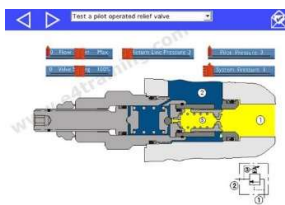
Learn to recognise the many different types of relief valve at

[/hydraulic\\_valves/relief1.php](/hydraulic_valves/relief1.php)

Dates & durations:

Complete

## Virtual test rig experiment



Experiment with the valve fundamentals simulation at

[/hydraulic\\_valves/relief3.php](/hydraulic_valves/relief3.php):

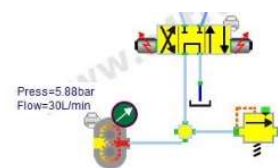
- Follow the suggested exercises and observations list below the simulation.
- Run the experiments, answer the questions, and click the buttons to see the answers.

Explore how a pilot operated relief valve works and what happens when you change the settings, flow rate, and back pressure.

Date, score & time:

Tick when posted

## Experiment with the hydraulic circuit simulation program



Experiment with the safety relief valve simulation at

</simulate/simulate1.php> by opening 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.

Date, score & time:

Tick when posted



Interactive quiz to check and reinforce learning



Complete the 'hydraulic valve questions' at [www.e4training.com/hydraulic\\_test1.php? Quiz - Hydraulics part 1](http://www.e4training.com/hydraulic_test1.php?Quiz-Hydraulics%20part%201)  
Post result when complete.

Quiz name, date, score:

Tick when posted

### Key questions / Plenary

- Can you explain what pressure relief valves do?
- Can you describe 3 different applications where pressure relief valves are used and explain why?
- Can you explain why a pilot operated pressure relief valve might be needed?
- Can you draw a pressure relief valve symbol?

Repeat above if the answer is no

### And Finally:

Complete this worksheet and keep for your records. Submit any written coursework etc. to your training supervisor. Export and keep a record of your LRS postings.

### Follow-on Course Worksheets:

Potential follow-on worksheets include:

- HV07 – Flow control valve operation, use, types (Introductory)
- or HV06 – Pressure relief valve features, tips, specification (Advanced).

For specialist course worksheets visit [www.e4training.com/hydraulic\\_courses/worksheets1.php](http://www.e4training.com/hydraulic_courses/worksheets1.php)

### Notes