

## Worksheet HV03 & Training Record Directional Valve Basics

## Hydraulic Components

|        |         |           |
|--------|---------|-----------|
| Email: | Course: | Provider: |
|--------|---------|-----------|

Learning Objectives/Expected Outcomes: (90 - 180 mins)

1. Appreciate hydraulic directional valves do and where they are used.
2. Understand how hydraulic directional valves work
3. Recognise and be able to interpret their symbols.
4. Appreciate the different types of directional valve.

Previous Knowledge Required:

Students should have completed worksheet HV01 'Check valve basics' or have a good knowledge of where hydraulic equipment is used and what it does.

Terminology:

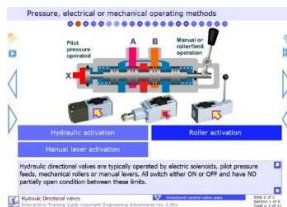
Directional valve, spool valve, on/off valve, 4 way 3 position valve, centre position.

Record of Achievement:



Click the mail icon to post your results to any free or standard LRS/LMS systems. See [www.e4training.com/xapi/](http://www.e4training.com/xapi/) for more details. Complete and keep this training record sheet along with any additional written work or sample calculations.

*Interactive tutorials*



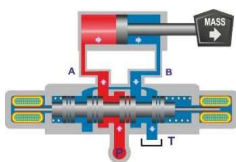
Complete the 'directional valve training' tutorial at [www.e4training.com/hydraulic\\_courses/microtutor1.php?wtvalvesdirect](http://www.e4training.com/hydraulic_courses/microtutor1.php?wtvalvesdirect)  
Complete quick quiz at end and post results.

Estimated time: 10 minutes, skill level 1-4

Date, score & time:

Tick when posted ☐

*Coursework investigations*



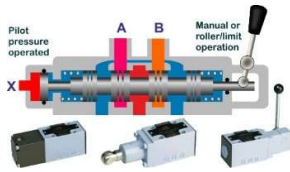
Appreciate 'What Directional Valves Do and Where Used' at [www.e4training.com/hydraulic\\_valves/directional1.php#box1](http://www.e4training.com/hydraulic_valves/directional1.php#box1) and identify:

- What functions do directional valves perform?
- For what reason might they be used?
- Typical applications where directional valves are used?

Estimated time: 20 minutes, skill level 1-4

Date complete:

Complete ☐



Appreciate 'How Directional Valves Work' by reading the explanation and watching the videos at

[www.e4training.com/hydraulic\\_valves/directional1.php#box2](http://www.e4training.com/hydraulic_valves/directional1.php#box2) & [Directional2.php](http://www.e4training.com/hydraulic_valves/directional2.php)

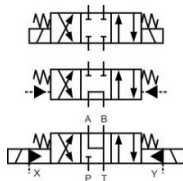
Review all of the key points including:

- How many different ways can the flow be directed?
- Consider the different operating mechanisms available.
- How do single and 2-stage valves differ?
- Why might the standby, centre condition be important?

Estimated time: 25 minutes, skill level 2-4

Date complete:

Complete ☐



Learn to recognise the different directional valve symbols at

[www.e4training.com/hyd\\_princip/symbol\\_directional1.php](http://www.e4training.com/hyd_princip/symbol_directional1.php) and identify:

- Do all directional valves have springs?
- How are the different activation methods shown?
- In what position is the symbol drawn, activated, or standby?
- How is the crossover conditions shown?

Estimated time: 20 minutes, skill level 2-4

Date complete:

Complete ☐



Appreciate 'The Different Types of Directional Valve' by reading the explanation at

[www.e4training.com/hydraulic\\_valves/directional1.php#box9](http://www.e4training.com/hydraulic_valves/directional1.php#box9)

Review all of the key points including:

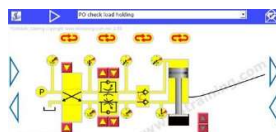
- What is the best way to identify a directional valve?
- Are the mounting faces different for mobile and industrial valves?
- What features might be different on different machines?

Estimated time: 15 minutes, skill level 2-4

Date complete:

Complete ☐

## Virtual test rig experiment



Experiment with the valve fundamentals simulation at

[www.e4training.com/hydraulic\\_valves/directional3.php](http://www.e4training.com/hydraulic_valves/directional3.php):

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

Estimated time: 30 minutes, skill level 3-4

Date, score:

Tick when posted ☐



## Interactive quiz to directional and reinforce learning



Complete the 'hydraulic valve questions' at  
[www.e4training.com/hydraulic\\_test2.php? Quiz - Hydraulics part 1](http://www.e4training.com/hydraulic_test2.php? Quiz - Hydraulics part 1)  
 Post result when complete.

Estimated time: 15 minutes, skill level 2-4

Quiz name, date, score:

Tick when posted

## Key questions / Plenary

- Can you explain what directional valves do?
- Can you describe 3 different ways directional valves can be operated?
- Can you explain why a pilot-operated directional valve might be needed?
- Can you draw a 3 way 2 position directional 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 course provider.

## Follow-on Course Worksheets:

Potential follow-on worksheets include:

- HV05 – Pressure relief valve operation, use, types (Introductory)
- or HV04 - Directional valve features, tips, specification (Advanced).

Or refer to your individual lesson plan or search the worksheet lists at

[www.e4training.com/hydraulic\\_courses/worksheets1.php](http://www.e4training.com/hydraulic_courses/worksheets1.php) or [courses1.php](http://www.e4training.com/courses1.php)

## Notes