engineering adventures

Worksheet CT1 & Training Record Hydraulic Scissor Lift Circuits		Hydraulic Circuits
Email:	Course:	Provider:

Expected Outcomes: (60-90mins)

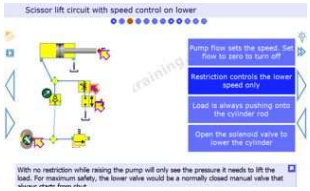
Understand the different features used in scissor lift hydraulic circuits and when and why they are used.

Produce a hydraulic circuit for a specific scissor lift design.

Previous Knowledge Required:

Students should have completed worksheet HV1 'Hydraulic control valves' and have a good knowledge of what the different hydraulic components are used.

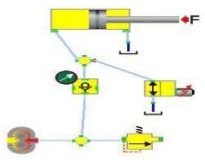
Self-driven micro-learning tutor (SDLT)



Complete the 'scissor lift circuit design training' SDLT app via www.e4training.com/hydraulic_courses/circuit1.php, phone app or CD/download

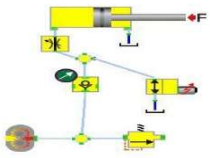
Date, score & time:	

Interactive experiments



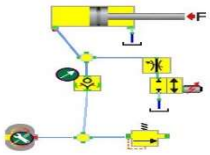
Experiment with the Circuits/ScissorLift1 simulation model at www.e4training.com/simulate/simulate2.php :

- Click the pump and set the flow to zero to stop lifting
- Click the solenoid to lower the load
- Change the pump flow and observe the cylinder speed changes
- Click the rod to change the mass, friction or force on the cylinder
- Observe how the pump pressure changes with load changes
- Observe how the pressure increase at the end of the cylinder stroke



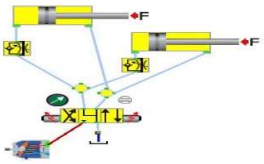
Select Circuits/ScissorLift2 :

- Change the pump flow and solenoid valve to raise and lower the cylinder
- Click on and change the orifice size to observe the effects on speed
- Compare the pump pressure (energy input) with previous circuit



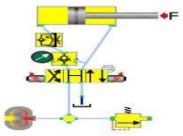
Select Circuits/ScissorLift3 :

- Change the orifice size and observe the effects on raise and lower speeds.
- Compare the energy efficiency with the previous circuit design



Select Circuits/SynchroniseCyls :

- Observe how two, unlinked cylinders maintain synchronisation
- Change the loads and restrictors to observe the effects
- Consider how this might affect scissor lift designs



Select Circuits/ScissorLift4 :

- Compare the performance and efficiency of a system where the cylinder is driven down and does not rely on gravity
- Discuss when this design may be more appropriate

Additional video and instructional resources

Visit www.e4training.com/projects/scissor1.php for additional explanation, videos and experiments.

Dates & durations (Optional):

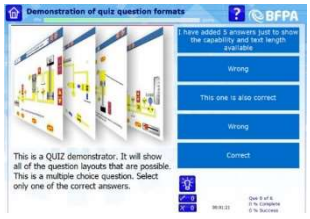
Coursework

Produce a report to explain which circuit features you would include in the hydraulic scissor lift design, based on the design specification required. This is likely to include a circuit drawing with explanations for how will achieve :

- Direction, speed, holding position and safe lowering.

Component summary report

Interactive quiz



Complete the 'TBC' Quiz either online at www.e4training.com/hydraulic_test2.php , phone app, CD or download.

Quiz name, date, score

Qualification pass requirements:

Students will need to complete and return all worksheets to their registered training provider. Methods of testing and qualification may vary between course providers.

For online certificates, students must post their results by clicking the email button that will appear in the app, once the training module has been completed.