



**ADVANCED DIPLOMA OF  
MECHANICAL ENGINEERING TECHNOLOGY**

**MODULE DETAILS**

**Module 6: Hydraulics**

Nominal duration: 4 weeks (48 hours total time commitment)

This time commitment includes the preparation reading, attendance at each webinar (1 hour plus 15-30 minutes for discussion), the time necessary to complete the assignments, and further study.

**MODULE PURPOSE**

This module helps students to increase their knowledge of the fundamentals, to improve their maintenance programs, and become excellent troubleshooters of problems in this area. Understanding 'how' a hydraulic component works leads to an understanding of how and why it fails. Towards the end of the module, students will have developed the skills and ability to recognize and solve hydraulic problems in a structured and confident manner.

**PRE-REQUISITE  
MODULES/UNIT(S)**

NONE

**ASSESSMENT STRATEGY**

To evaluate the achievement of the learning outcomes; written assignments, group projects and practical exercises are set.

**SUMMARY OF LEARNING  
OUTCOMES**

1. Examine and discuss the basics of pressure and flow
2. Describe the classification and construction of hydraulic cylinders
3. Describe the classification and actuation of control valves
4. Describe the classification and operation of pressure control valves
5. Examine the different types of electro-hydraulic systems

**Learning Outcome 1**

**Examine and discuss the basics of pressure and flow**

**Assessment criteria**

- 1.1 Define pressure measurement and apply appropriate units of measurement
- 1.2 Apply Pascal's law
- 1.3 Describe the relationships between pressure, force and flow
- 1.4 Distinguish between the various types of flow
- 1.5 Explain Bernoulli's principle



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<b>Learning Outcome 2</b>	<b>Describe the classification and construction of hydraulic cylinders</b>
<b>Assessment criteria</b>	<ul style="list-style-type: none"><li>2.1 Discuss the classification of hydraulic cylinders (single/double acting)</li><li>2.2 Discuss cylinders in terms of their construction and mounting</li><li>2.3 Outline the steps involved in cylinder design</li><li>2.4 Examine and discuss common cylinder problems</li></ul>
<b>Learning Outcome 3</b>	<b>Describe the classification and actuation of control valves</b>
<b>Assessment criteria</b>	<ul style="list-style-type: none"><li>3.1 Describe the purpose of control valves</li><li>3.2 Discuss the classification of control valves</li><li>3.3 Recognize and apply the various valve-related symbols</li><li>3.4 Distinguish between the various valve types</li><li>3.5 Compare the different valve actuation methods</li><li>3.6 Discuss the implications of positive and negative overlapping</li><li>3.7 Distinguish between the various valve center positions</li></ul>
<b>Learning Outcome 4</b>	<b>Describe the classification and operation of pressure control valves</b>
<b>Assessment criteria</b>	<ul style="list-style-type: none"><li>4.1 Examine and discuss the operation of the various types of pressure control valve</li><li>4.2 Discuss the concept of surge pressure</li></ul>
<b>Learning Outcome 5</b>	<b>Examine the different types of electro-hydraulic systems</b>
<b>Assessment criteria</b>	<ul style="list-style-type: none"><li>5.1 Discuss the operation of a proportional solenoid</li><li>5.2 Describe the characteristics and application of the various types of proportional valves:</li></ul>



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- 5.3 Describe the characteristics and application of the various types of servo valves:
- 5.4 Discuss the use of transducers in hydraulic systems

### **Delivery Mode**

A combination of asynchronous and synchronous e-learning delivery comprising a judicious mix of interactive online web conferencing, simulation (virtual labs) software, remote online labs, online videos, PowerPoint slides, notes, reading and study materials (in PDF, HTML and Word format) accessed through the Moodle Learning Management System (LMS).