



Learners will explore the processes and components associated with the maintenance of mechanical systems and undertake maintenance tasks on a mechanical system.

Learning Aim A

learners will provide a balanced evaluation of the lubrication maintenance requirements, the process of lubrication in the system and the characteristics of the lubricants used. They will compare the lubrication of each system and suggest improvements to the process, characteristics or maintenance requirements. For example, the improvement could suggest a different lubricant for a mechanical system or perhaps a lubrication additive for a lawnmower engine.

Learning Aim D

learners will refine, while using the correct processes, the completion of two different maintenance tasks on an appropriate mechanical system. This will be completed safely, sustainably, accurately and efficiently. Efficiency will be evident in learners who prepare well for the task, for example by gathering the correct consumables and components in advance, walking through the task prior to completing it, outlining who will complete the tasks and what is the most appropriate order (sequence) in which to do this, while keeping the workshop well organised, reasonably clean and ensuring that risks are mitigated. Their inspection checks will be completed during the tasks and appropriate records made. Once complete, the system will work as intended.

Unit Overview

Mechanical systems are at the heart of many of the machines that we use to carry out work on our behalf, from cars to the escalators that move us between floors in shopping centres. Mechanical systems harness power, for example from an electrical motor, and involve the movement to complete a task. Power transmission is responsible for the movement of energy from a power source to a location where it performs useful work.

In this unit, you will explore the maintenance of different mechanical systems, including the use of lubricants and lubrication systems and the application of seals, bearings and fastenings. You will explore the function of power transmission and mechanical systems in general. Finally, you will complete routine maintenance on a mechanical system safely.

As an engineer you may need to undertake work on mechanical systems competently and efficiently if they are to continue to work properly. This unit will help to prepare you for an engineering apprenticeship, an engineering degree in higher education or for technician-level roles in a variety of engineering specialist areas.

Learning Aims:

- A** Examine the characteristics of lubricants and their application in mechanical systems
- B** Investigate the characteristics and applications of common consumable components used in mechanical systems
- C** Investigate the operation and application of power transmission components used in mechanical systems
- D** Carry out routine maintenance safely and sustainably to help ensure the continued operation of a mechanical system.

Learning Aim B and C

learners will produce evidence of a thorough and consistent investigation of two mechanical systems, evaluating the use of seals, bearings, fastenings, gear trains and two other power transmission components. They will inform their evaluation through independent research based on the internet and other credible sources. Learners will present the advantages and disadvantages of components used in the task and will suggest two alternatives, providing a justification for each. For example, learners may evaluate a solid bronze bearing employed in a system before exploring alternative roller bearings, suggesting why these might be more Learners will evaluate how each component in the system contributes towards the overall operation and maintenance of the system, for example considering the operational requirement of the rotational support that a roller bearing would provide for a system, noting the radial and axial loading and the speed range.

Key Vocabulary

Drive train, Fuel Injector, crankshaft, camshaft, combustion, lubrication

Work Related Learning:

Gaining knowledge in Mechanics that can be used in any Mechanical engineering role

Numeracy links:

Mechanics uses specific Physics that is needed to calculate values such as motion and torque

SMSC and British Values

Understanding the importance that Mechanics has in solving critical issues in the world.