

HYDRAULIC SYSTEMS

UNIT CODE: ENG/CU/AME/CR/04/4

Relationship to Occupational Standards

This unit addresses the unit of competency: Maintain Hydraulic System

Duration of the unit: 80 hours

Unit description:

This unit specifies the competencies required to interpret agricultural hydraulic systems and perform trouble shooting of hydraulic systems. It also involves performing service and maintenance of hydraulic systems. It also involves calibration of hydraulic systems and optimization of the operations of the hydraulic systems.

Summary of Learning Outcomes:

By the end of the unit, the trainee should be able to:

1. Interpret agricultural hydraulic systems
2. Perform trouble shooting of hydraulic systems
3. Perform service and maintenance of hydraulic systems
4. Calibrate hydraulic systems
5. Optimize the operations of the hydraulic systems

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Interpret agricultural hydraulic systems	<ul style="list-style-type: none">● The observance of Kenyan regulations concerned with health, safety and the environment;● Demonstrate disposal of faulty components● Use personal protective equipment and clothing (PPE) throughout work activities;	<ul style="list-style-type: none">● Practical exercises● Oral questioning● Learner portfolio of evidence

	<ul style="list-style-type: none"> ● Identify components of hydraulic system ● Select tools and equipment for servicing Hydraulic system ● Dismantle the hydraulic system for service. ● Identify hydraulic systems are ● Describe working principles of hydraulic systems ● Compare hydraulic systems ● Identified Hydraulic systems components ● Interpreted schematic representations of hydraulic systems ● Use of technical data in servicing and repairing components. 	
2. Perform trouble shooting of hydraulic systems	<ul style="list-style-type: none"> ● Select appropriate tools and equipment ● Apply appropriate safety protocols to evaluation of hydraulic systems ● Identify common malfunctions of hydraulic systems ● Test for malfunction and performance of hydraulic systems ● Demonstrate understanding of principles of operation of the pump ● Demonstrate understanding of Structure of the pump ● Perform service and fitting of the pump ● Demonstrate precautions when handling hydraulic pump. ● Use flow controls and dividers 	<ul style="list-style-type: none"> ● Observation ● Practical ● Projects
3. Perform service and maintenance of hydraulic systems	<ul style="list-style-type: none"> ● Perform service and maintenance procedures on hydraulic system circuits ● Generate service and maintenance reports on hydraulic systems to industry standards ● Hydraulic reservoirs 	<ul style="list-style-type: none"> ● Practical exercises ● Oral questioning ● Written tests ● Learner portfolio of evidence.

	<ul style="list-style-type: none"> • Hydraulic filters • System and machine plumbing • Air dryers and lubricants • Principle of operation of the relief and unloading pressure control valves • Types and Structure of valves • Fluid power actuators • Accumulators • High- and low-pressure pipes • Intensifiers 	
4. Calibrate hydraulic systems	<ul style="list-style-type: none"> • Tools and equipment for testing • Manufacturer's specification in setting pressure and voltage • Identify appropriate tools and equipment for calibration • Perform adjustments on hydraulic systems according to factory specifications • Perform calibration of hydraulic systems 	<ul style="list-style-type: none"> • Practical exercises • Oral questioning • Learner portfolio of evidence. • Observation
5. Optimize the operations of the hydraulic systems	<ul style="list-style-type: none"> • Apply appropriate safety protocols to evaluation of hydraulic systems • Perform tests on hydraulic system circuits • Analyze results of tests of hydraulic system circuits • Field-test the operation of hydraulic systems 	<ul style="list-style-type: none"> • Practical exercises • Oral questioning • Written tests • Learner portfolio of evidence

Suggested Methods of Delivery

- Presentations and practical demonstrations by trainer;
- Guided learner activities and research to develop underpinning knowledge;
- Supervised activities and projects in a workshop;

The delivery may also be supplemented and enhanced by the following, if the opportunity allows:

- Visiting lecturer/trainer from the workshop service and repair sector;
- Industrial visits.

Recommended Resources

<p>Tools</p> <p>Comprehensive set of hand tools for the service and repair of agricultural equipment hydraulic systems</p>
<p>Equipment</p> <ul style="list-style-type: none">● Hydraulic system Instructional models;● A fully equipped agricultural equipment maintenance workshop;● Fully functional tractor(s)● Functional hydraulic system;● Hydraulic system components and units;● Vehicle lift/inspection pit;● Specialist tools and diagnostic equipment appropriate for the different makes and types of agricultural equipment and implements that are being maintained;● Internet access to manufacturers' technical information;● Torque setting tools;● Personal protective equipment (PPE) and suitable coverings to protect vehicles;● Facilities for the disposal of waste oil and used parts;● Customer database and systems for recording maintenance records.
<p>Materials and supplies</p> <ul style="list-style-type: none">● Digital instructional material including DVDs and CDs;● Consumables for service and repair of hydraulic systems including;● Oil seals and gaskets;● Coolants;● Cleaning materials;● Hand cleaner;

- Dusters.
- Hydraulic fluids
- Separate parts and components of several different hydraulic systems

Reference materials

- Manufacturers service manuals for the hydraulic systems that are being serviced;
- Appropriate agricultural mechanics text books available on numerous websites

easytvvet.com