

- Appropriate automotive engineering text books available on numerous websites e.g.

## **SERVICING VEHICLE SUSPENSION SYSTEMS**

**UNIT CODE: ENG/CU/AUT/CR/6/6**

### **Relationship to Occupational Standards**

*This unit addresses the unit of competency and meets the requirements specified by the Occupational Standards: Service vehicle suspension.*

**Duration of Unit:** 120 hours

### **Unit Description:**

#### **Unit description:**

This unit specifies competencies required to service vehicle suspension system. It involves assessment, removal, servicing and replacement of vehicle suspension components. It also involves fitting and testing vehicle suspension components and documenting vehicle suspension service.

### **Summary of Learning Outcomes:**

1. Assess vehicle suspension system.
2. Remove vehicle suspension components.
3. Assess vehicle suspension components serviceability.
4. Replace/service vehicle suspension components.
5. Fit and test vehicle suspension components.
6. Vehicle suspension system service documentation

### **Learning Outcomes, Content and Suggested Assessment Methods**

<b>Learning Outcome</b>	<b>Content</b>	<b>Suggested Assessment Method</b>

<p>1. Assess vehicle suspension system.</p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> The observance of Kenyan regulations concerned with health, safety and the environment; The use of</li> <li><input type="checkbox"/> personal protective equipment and clothing (PPE) used throughout work activities; The</li> <li><input type="checkbox"/> disposal of scrap components, waste oils and fluids in accordance with current legal requirements and company policy.</li> <li><input type="checkbox"/> Functions of suspension system in the vehicle</li> <li><input type="checkbox"/> Types of suspension systems</li> <li><input type="checkbox"/> MacPherson strut</li> <li><input type="checkbox"/> Wishbone</li> <li><input type="checkbox"/> Construction</li> <li><input type="checkbox"/> Operation</li> <li><input type="checkbox"/> Suspension units in a</li> <li><input type="checkbox"/> vehicle</li> </ul>	<ul style="list-style-type: none"> <li>• Practical exercises</li> <li>• Oral questioning</li> <li><input type="checkbox"/> Written test</li> <li>• Learner portfolio of evidence.</li> </ul>
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<b>Learning Outcome</b>	<b>Content</b>	<b>Suggested Assessment Method</b>
	<ul style="list-style-type: none"> <li><input type="checkbox"/> Springs</li> <li><input type="checkbox"/> Arms</li> <li><input type="checkbox"/> Dampers</li> <li><input type="checkbox"/> Air suspension</li> <li><input type="checkbox"/> Hydra gas</li> <li><input type="checkbox"/> Hydro pneumatic</li> <li><input type="checkbox"/> Hydraulic suspension</li> <li><input type="checkbox"/> Rubber suspension</li> <li><input type="checkbox"/> Hydrolastic</li> </ul>	

<p>2. Remove vehicle suspension components.</p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> The importance of using appropriate technical information throughout servicing and repair activities;</li> <li><input type="checkbox"/> Identification and selection of appropriate tools, equipment, and personal protective when removing suspension units and components;</li> <li><input type="checkbox"/> Correct methods and procedures for the removal of suspension units. The layout and operation of suspension systems; The construction and</li> <li><input type="checkbox"/> and</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Practical exercises</li> <li><input type="checkbox"/> Oral questioning</li> <li><input type="checkbox"/> Written test</li> <li><input type="checkbox"/> Learner</li> <li><input type="checkbox"/> portfolio of evidence.</li> </ul>
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<b>Learning Outcome</b>	<b>Content</b>	<b>Suggested Assessment Method</b>
	<p>operation of suspension systems units including:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Suspension coil and leaf springs;</li> <li><input type="checkbox"/> Torsion bar spring;</li> <li><input type="checkbox"/> Suspension dampers;</li> <li><input type="checkbox"/> Suspension struts;</li> <li><input type="checkbox"/> Control arms;</li> <li><input type="checkbox"/> Tie rods;</li> <li><input type="checkbox"/> Anti-roll bar;</li> <li><input type="checkbox"/> Hydro-Pneumatic and control unit;</li> </ul>	

<p>3. Assess vehicle suspension components serviceability.</p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Troubleshooting vehicle suspension components</li> <li><input type="checkbox"/> Tools and equipment for troubleshooting vehicle suspension system Using</li> <li><input type="checkbox"/> visual and measurement methods and procedures for inspecting and assessing components for: <ul style="list-style-type: none"> <li>Damage;</li> <li>Wear;</li> <li>Corrosion;</li> <li>Fracture;</li> <li></li> <li></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Practical exercises</li> <li><input type="checkbox"/> Oral questioning</li> <li><input type="checkbox"/> Written test</li> <li><input type="checkbox"/> Learner portfolio of evidence.</li> </ul>
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<b>Learning Outcome</b>	<b>Content</b>	<b>Suggested Assessment Method</b>
	<ul style="list-style-type: none"> <li><input type="checkbox"/> Distortion.</li> <li><input type="checkbox"/> Servicing vehicle suspension system</li> <li><input type="checkbox"/> Materials used in servicing vehicle suspension system</li> <li><input type="checkbox"/> Disposal of faulty vehicle suspension system</li> </ul>	

<p>4. Replace/service vehicle suspension components.</p>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Cleaning of components to facilitate inspection and assessment of components</li> <li><input type="checkbox"/> Evaluate components for: <ul style="list-style-type: none"> <li><input type="checkbox"/> Serviceability;</li> <li><input type="checkbox"/> Unserviceability;</li> <li><input type="checkbox"/> Tolerances;</li> <li><input type="checkbox"/> Need for replacement;</li> <li><input type="checkbox"/> Need for adjustment.</li> </ul> </li> <li><input type="checkbox"/> Components reassembled</li> <li><input type="checkbox"/> in accordance with manufacturers' procedures, torque settings and adjustments;</li> <li>Importance of the use of</li> <li><input type="checkbox"/> manufactures' part numbers for replacement parts;</li> <li>Selection and use of</li> <li><input type="checkbox"/></li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Practical exercises</li> <li><input type="checkbox"/> Oral questioning</li> <li>Written test</li> <li><input type="checkbox"/> Learner</li> <li><input type="checkbox"/> portfolio of evidence.</li> </ul>
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<b>Learning Outcome</b>	<b>Content</b>	<b>Suggested Assessment Method</b>
	<p style="text-align: center;">gaskets, seals, shims, fittings and fasteners;</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Test and evaluate the performance of the suspension and steering units and components after reassembly.</li> </ul>	

5. Fit and test vehicle suspension components.	<input type="checkbox"/> The selection and use of appropriate tools and equipment for the replacement of suspension and steering units; <input type="checkbox"/> Procedure of replacing suspension <input type="checkbox"/> Securing and adjusting external linkages, connections and operating mechanisms; <input type="checkbox"/> Replenishing of lubricants and fluids. <input type="checkbox"/> Setting of suspension geometry.	<input type="checkbox"/> Practical exercises <input type="checkbox"/> Oral questioning <input type="checkbox"/> Written test <input type="checkbox"/> Learner portfolio of evidence <input type="checkbox"/> evidence
6. Vehicle suspension system service documentation	<input type="checkbox"/> Importance of testing vehicle suspension system. <input type="checkbox"/> Types of tests done on suspension system.	<input type="checkbox"/> Practical exercises <input type="checkbox"/> Oral questioning
<b>Learning Outcome</b>	<b>Content</b>	<b>Suggested Assessment Method</b>
	<input type="checkbox"/> Data analyzation and report writing. The importance of completing all service and repair activities within an agreed timescale and keeping others informed of progress	<input type="checkbox"/> Written test <input type="checkbox"/> 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 motor vehicle service and repair sector;
- Industrial visits.

### Recommended Resources

#### Tools

Comprehensive set of hand tools for the service and repair of motor vehicle suspension and steering systems.

### **Tools**

Comprehensive set of hand tools for the service and repair of motor vehicle suspension and steering systems.

### **Equipment**

- Suspension systems instructi
- A fully equipped motor vehicle maintenance workshop
- Fully functional light vehicle(s)
- Suspension units
- Vehicle lift/inspection pit,
- Specialist tools and diagnostic equipment appropriate for the different makes and types of vehicle that are being worked on;
- 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

### **Materials and supplies**

Digital instructional material including DVDs and CDs

Consumables for service and repair of suspension and steering systems including:

- Steering and suspension lubricants including grease
- Power assisted steering fluid
- Oil seals and gaskets
- Cleaning materials
- Hand cleaner
- Dusters

### **Tools**

Comprehensive set of hand tools for the service and repair of motor vehicle suspension and steering systems.

### **Reference materials**

- Manufacturers service manuals for the vehicles that are being serviced
- Appropriate automotive engineering text books available on numerous websites