

SERVICE VEHICLE TRANSMISSION SYSTEMS

UNIT CODE: ENG/OS/AUT/CR/4/6

UNIT DESCRIPTION:

This unit specifies competencies required to service vehicle transmission system. It involves preparing to service vehicle transmission systems, removing, assessing, repairing/replacing and testing the vehicle transmission system.

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT	PERFORMANCE CRITERIA
These describe the key outcomes which make the workplace function.	These are assessable statements which specify the required level of performance for each of the elements. <i>Bold and italicized terms are elaborated in the Range</i>
1. Organize to service vehicle transmission system	1.1 Work area is cleaned and safety measures undertaken before use as per workshop regulations/ OSHA 1.2 Vehicle is parked on a workshop hoist as per workshop regulations 1.3 Tools and equipment and materials are availed as per manufacturers recommendation 1.4 Identify relevant workforce according to workshop procedures.
2. Troubleshoot vehicle transmission system	2.1 Visual inspection of the vehicle is done according to workshop procedures. 2.2 Technical inspection is done while engine is running according to manufacturer's specifications. 2.3 Vehicle is inspected underneath

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	<p>according to workshop setup.</p> <p>2.4 Faulty components are established according to inspection done.</p>
<p>3. Overhaul gear box unit (Manual)</p>	<p>3.1 Drain gearbox oil according to workshop procedures.</p> <p>3.2 Remove faulty gearbox from vehicle according to manufacturer's manual.</p> <p>3.3 Clean external housing of the gearbox according to workshop procedures.</p> <p>3.4 Dismantle faulty gearbox according to manufacturer's manual.</p> <p>3.5 Clean internal <i>manual gearbox components</i> according to workshop procedures.</p> <p>3.6 Service and replace worn out gearbox components according to manufacturer's specifications.</p> <p>3.7 Assemble serviced/new components of the gearbox according to manufacturer's manual.</p> <p>3.8 Fit new gearbox mounting according to workshop procedures.</p> <p>3.9 Refit serviced gearbox to the vehicle according to manufacturer's manual.</p> <p>3.10 Refill gearbox oil to the Recommended level according to</p>

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	manufacturer's specification. 3.11 Test serviced gearbox according to workshop procedures.
4. Overhaul gearbox (semi/automatic)	4.1 Drain automatic transmission fluid (ATF) according to workshop procedures. 4.2 Remove faulty gearbox from the vehicle according to manufacturer's manual. 4.3 Clean external housing of the gearbox according to workshop procedures. 4.4 Dismantle faulty gearbox according to manufacturer's manual. 4.5 Clean internal <i>semi/automatic gearbox components</i> according to workshop procedures. 4.6 Service and replace worn out gearbox components according to manufacturer's specifications. 4.7 Assemble serviced/new components of the gearbox according to manufacturer's manual. 4.8 Fit new gearbox mountings according to workshop procedures. 4.9 Refit serviced gearbox to the vehicle according to manufacturer's manual. 4.10 Refill ATF to the recommended level according to manufacturer's

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5. Carry out hydraulic/tiptronic system tests and measurements	5.1 Identify tools and equipment according to manufacturer's specifications. 5.2 Perform stall test according to manufacturer's manual 5.3 Perform pressure test according to manufacturer's specifications. 5.4 Perform shift test according to manufacturer's specifications. 5.5 Perform tiptronic diagnosis test using fault diagnostic gadget according to manufacturer's manual. 5.6 Record and file results according to standards operation procedures.

RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

Variable	Range
1. Components may include but is not limited to:	1.1 Bearings 1.2 Gears

Variable	Range
	1.3 Synchronesh unit 1.4 Gearbox shafts and thrust plates 1.5 Gear selectors, sensors and linkages 1.6 Constant velocity and universal joints 1.7 Clutch assemblies release bearings 1.8 Automatic gearbox pump and oil strainer 1.9 Transmission unit mounting 2.0 Flywheel 2.1 Transmission drive shaft/half shaft 2.2 Propeller shaft/center rubber
2. Manual gearbox components may include but is not limited to:	2.1 Input shaft 2.2 Lay shaft 2.3 Output shaft 2.4 Speed gearwheels 2.5 Synchronizer unit 2.6 Selector shafts/forks
3. Semi/automatic gearbox components may include but is not limited to:	3.1 Fluid flywheel 3.2 Torque convertor 3.3 Shift valve 3.4 Brake bands 3.5 Front clutch 3.6 Rear clutch 3.7 Sun wheel gears 3.8 Planetary gears 3.9 Carrier gear 4.0 Output shaft

REQUIRED KNOWLEDGE AND SKILL

Required knowledge

The individual needs to demonstrate knowledge of:

- Operation of transmission systems
- Measuring, assessing the condition of components
- Fault rectification
- Kenyan legislation and workplace procedures relevant to:
 - health and safety
 - the environment (including waste disposal)
 - personal and vehicle protective equipment
- Legal requirements relating to the vehicle and its construction
- Workplace procedures for:
 - recording fault location and correction activities;
 - reporting the results of tests;
 - the referral of problems;
 - reporting delays to the completion of work
- Recognized assessment and rectification
- Procedures and obtaining the correct information for rectification
- Documenting assessment and rectification information
- Working within given time frame and sharing information
- The relationship between time, costs and profitability
- How to find, interpret and use sources of technical information for transmission of servicing activities
- Reporting anticipated delays to relevant person(s)
- Purpose of, and how to use identification codes
- How to prepare, inspect, test and use all the removal and replacement equipment required
- Operation of transmission systems
- Gaskets, sealants, seals, fittings and fasteners
- Test and evaluate the performance of replacement transmission system units and components

- The relationship between testing methods and the transmission system units and components replaced – the use of appropriate test methods
- When replacement units and components must meet the original equipment specification (OES) for warranty or other requirements
- How to work safely avoiding damage to other vehicle systems, units and components and contact with leakage and hazardous substances
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Required Skills

The individual needs to demonstrate the following skills:

- Decision making;
- Multitasking;
- First aid;
- Communications (verbal and written);
- Proficient in ICT;
- Time management;
- Problem solving;
- Planning;
- Report writing;
 - Driving

EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

<p>1. Critical Aspects of Competency.</p>	<p><i>Assessment requires evidence that the candidate:</i></p> <p>1.1 Worked in a safe and clean environment using personal protection and appropriate tools and equipment;</p> <p>1.2 Observed regulations concerned with health</p>
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	<p>and safety and the disposal of waste;</p> <p>1.3 Used technical information to remove and dismantle transmission units and assess components against manufacturers' specifications</p> <p>1.4 Prepared recommendations for the repair and restoration of components</p> <p>1.5 Restored, reassembled and replaced transmission units to accord with manufacturers' specifications</p> <p>1.6 Prepared vehicle transmission system servicing report.</p> <p>1.7 Completed vehicle transmission system servicing within agreed time frame. `</p>
<p>2. Resource Implications.</p>	<p><i>The following resources must be provided:</i></p> <p>2.1 Workshop fully equipped for servicing motor vehicle transmission systems</p> <p>2.2 Vehicle lift,</p> <p>2.3 Specialist tools and equipment appropriate for the different makes of vehicles</p> <p>2.4 Instruments and equipment for measuring and assessing the condition of transmission units;</p> <p>2.5 Specialist equipment for servicing automatic transmission units;</p> <p>2.6 Access to manufacturers' technical information;</p> <p>2.7 Facilities for the disposal of waste oil and scrap parts;</p> <p>2.8 Customer database and systems for recording service records;</p> <p>2.9 Personal protection equipment.</p>

<p>3. Methods of Assessment.</p>	<p><i>Competency may be assessed through:</i> 3.1 Observation with the use of checklists; 3.2 Verbal questioning during service and repair activities 3.3 Short-answer tests</p>
<p>4. Context of Assessment.</p>	<p>Competency may be assessed individually in an actual workplace or in work-simulated conditions within accredited institutions.</p>
<p>5. Guidance information for assessment.</p>	<p>This unit may be assessed on an integrated basis with others within this occupational sector.</p>

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