

SERVICE VEHICLE BRAKING SYSTEM

UNIT CODE: ENG/OS/AUT/CR/7/6

UNIT DESCRIPTION:

This unit specifies competencies required to service motor vehicle braking system. It involves, assessing, servicing, replacing or repairing and maintaining vehicle braking units and components. It includes final testing to ensure satisfactory operation to the customer's specification.

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. Assess vehicle braking system	1.1 <i>Tools and equipment</i> are used as per service manual 1.2 Personal protective clothing and equipment PPE is used as per workshop regulations 1.3 Vehicle braking system is tested in accordance with service manual 1.4 Braking system are observed according to the service manual 1.5 Braking system observation checklist is filled as per company policy
2. Dismantle wheel brake assembly parts	2.1 Vehicle is parked and prepared in accordance with workshop procedures 2.2 <i>Sources of technical information</i> are used as per service manual 2.3 <i>Brake components are</i> dismantled as per service

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	<p>manual and checklist</p> <p>2.3 Lubricants and fluids are drained and disposed in accordance with Occupational Safety and Health regulations <i>OSHA 2007</i></p>
<p>3. Assess braking components</p>	<p>3.2 <i>Brake</i> components are cleaned in accordance with the service manual</p> <p>3.3 Brake <i>components</i> are <i>assessed in accordance</i> with manufacture's specifications</p> <p>3.4 Worn/damaged <i>components</i> are identified according to the service manual</p> <p>3.5 Compatibility of replacement parts is verified against manufacturers part numbers</p>
<p>4. Replace wheel brake assembly parts</p>	<p>4.1 Brake pads and linings are replaced in accordance to manufacturer's specifications</p> <p>4.2 Brake calipers and drum are replaced according manufacturer's specifications</p> <p>4.3 Brake flexible pipes are replaced as per the manufacturer's specifications</p> <p>4.4 Brake adjusters/actuators (HCV) are replaced as per the manufacturer's specifications</p> <p>4.5 Parking brake cables are serviced/replaced according to the manufacturer's manual</p>
<p>5. Replace brake cylinders</p>	<p>5.1 Brake master cylinder is replaced/serviced according manufacturer's manual</p> <p>5.2 Brake slave cylinder is replaced/serviced as per the manufacturer's specifications</p>

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	5.3 Brake booster is serviced as per the
6. Service brake system	6.1 Drum/disc brakes are assembled according to the manuals 6.2 Brake fluid is replenished and system bleeding is carried out as per service manual 6.3 Brake booster and ABS system is service according to the manufacturer's specifications 6.4 Braking system is adjusted (Dynamometer test) as per the workshop manual 6.5 Auxiliary brakes are serviced according the manufacturer's manual 6.6 Vehicle is road tested in accordance with legal requirements and manufacturers parameters 6.7 Service and repair activities are completed within an <i>agreed time frame</i> 6.8 Service and repair <i>records</i> are completed in accordance with Standard Operating 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. Brake units and components may include but is not limited to:	1.1 Servo unit (booster) 1.2 Master cylinder 1.3 Calipers 1.4 Disc (rotor) 1.5 Drum 1.6 Brake pads and linings 1.7 Wheel cylinders 1.8 Brake adjusters 1.9 Actuators 1.10 ABS unit 1.11 Flexible pipes 1.12 Parking brake cable.
2. Assessment may include but is not limited to:	2.1 Corrosion 2.2 Seizure 2.3 Serviceable 2.4 Unserviceable 2.5 Within or outside tolerances 2.6 Necessitates adjustment.
3. Records may include but is not limited to:	3.1 Job cards 3.2 Company IT system 3.3 Customer database
4. Agreed timescale may include but is not limited to:	4.1 Manufacturers' recommended work times 4.2 Job times set by the company 4.3 Job time agreed with a specific customer
5. High energy electrical	5.1 High tension ignition circuits;

Variable	Range
components may include but is not limited to:	5.2 Xenon Headlamps.

REQUIRED KNOWLEDGE

The individual needs to demonstrate knowledge of:

- Legislative and organizational requirements and procedures
- Kenyan legislation and workplace procedures relevant to:
 - health and safety
 - the environment (including waste disposal);
 - appropriate personal and vehicle protective equipment
- Legal requirements relating to the vehicle and its construction including brake operation and efficiencies
- 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

The importance of working to recognized assessment and rectification procedures and obtaining the correct information for rectification

- The importance of documenting assessment and rectification information.
- The importance of working to agreed timescales and keeping others informed of progress.
- The relationship between time, costs and profitability
- The importance of reporting anticipated delays to relevant person(s) promptly. The use of technical information including
- How to find, interpret and use sources of technical information for brake servicing activities
- The importance of using the correct sources of technical information
- The purpose of, and how to use identification codes

- Vehicle earthing principles and earthing methods
- Electrical and electronic principles associated with transmission systems, including types of sensors and actuators, their application and operation
- Types of circuit protection and why these are necessary.
- Electrical safety procedures, electric symbols, units and terms
- Electrical and electronic control system principles
- The hazards associated with high energy electrical component.

Operation of brake systems

- How brake and their related units and components are constructed, removed and replaced for the classification of vehicle worked upon
- Brake units and components removal and replacement
- How to remove and replace brake system mechanical, electrical and hydraulic units and components for the classification of vehicle worked upon
- How to select and use sealants, seals, fittings and fasteners
- How to test and evaluate the performance of replacement brake system units and components and the reassembled system against the vehicle
- Operating specifications and any legal requirements
- 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

Required Skills

The individual needs to demonstrate the following skills

- Proficient in ICT
- Time management
- Problem solving

- Communications (verbal and written)
- Planning
- Decision making
- Multitasking
- First aid
- Report writing
- Record keeping
- Driving

EVIDENCE GUIDE

This provides advice on assessment and must be 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 and safety and the disposal of waste</p> <p>1.3 Used technical information to remove and dismantle brake components and assess components against manufacturers’ specifications;</p> <p>1.4 Prepared recommendations for the repair brake components</p> <p>1.5 Repaired, reassembled and replaced brake components in accordance with manufacturers’ specifications</p> <p>1.6 Finalized servicing activities to conform to vehicle operating specifications within specified time</p>
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	<p>frame</p> <p>1.6 Performed vehicle road test appropriately</p>
2. Resource Implications.	<p><i>The following resources must be provided:</i></p> <p>2.1 A workshop that is fully equipped for servicing light motor vehicle brake systems including a vehicle lift, specialist tools and equipment appropriate for the different makes of vehicles that are being serviced</p> <p>2.2 Instruments and equipment for measuring and assessing the condition of brake units</p> <p>2.3 Specialist equipment for servicing ABS brake units</p> <p>2.4 Access to manufacturers' technical information</p> <p>2.5 Facilities for the disposal of waste oil, fluids and scrap parts</p> <p>2.6 Customer database and systems for recording service records</p> <p>2.7 Personal protection equipment.</p>
3. Methods of Assessment.	<p><i>Competency may be assessed through:</i></p> <p>3.1 Observation with the use of checklists</p> <p>3.2 Verbal questioning during service and repair activities to test underpinning knowledge</p> <p>3.3 Short-answer tests to assess understanding of the operation of brake systems, measuring, assessing</p>

	the condition of components and fault rectification.
4. Context of Assessment.	Competency may be assessed individually in an actual workplace or in work-simulated conditions within accredited institutions.
5. Guidance information for assessment.	This unit may be assessed on an integrated basis with others within this occupational sector.

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