

<b>Domain</b>	<b>AUTOMOTIVE ELECTRICAL AND ELECTRONICS</b>	<b>Unit ID: 483</b>
<b>Title:</b>	<b>Test and repair electrical charging system</b>	
<b>Level: 2</b>		<b>Credits: 5</b>

### Purpose

This unit standard specifies the competencies required to test and repair the electrical charging system. It includes testing and servicing of a charging system and/or associated parts. This unit standard is intended for those who work as automotive electricians.

### Special Notes

1. Entry information:
  - Prerequisite
    - Unit 65 - *Apply safety rules and regulations in an automotive mechanics workshop* or demonstrated equivalent knowledge and skills.
2. Assessment evidence may be collected from a real workplace or a simulated real workplace or an appropriate simulated realistic environment in which automotive electrical and electronic operations are carried out.
3. Performance of all elements in this unit standard must comply with manufacturers' specifications, workplace specific requirements and reasonable flat rate time.
4. Glossary of terms:
  - '*charging system*' may also include solar systems, including single and ganged panels, internal and external regulation, battery sensed and non-battery sensed, 6 V, 12 V and 24 V operation and solid-state controlled systems.
5. Regulations and legislation relevant to this unit standard include the following:
  - Labour Act, No. 6, 1992
  - Occupational Health and Safety Regulations No. 18, 1997
  - Road Traffic and Transport Regulations No. 266, 2000
 and all subsequent amendments.
6. This unit standard applies to passenger and commercial vehicles, heavy plant and earthmoving equipment.

## **Quality Assurance Requirements**

This unit standard and others within this subfield may be awarded by institutions which meet the accreditation requirements set by the Namibia Qualifications Authority and the Namibia Training Authority and which comply with the national assessment and moderation requirements. Details of specific accreditation requirements and the national assessment arrangements are available from the Namibia Qualifications Authority and the Namibia Training Authority. All approved unit standards, qualifications and national assessment arrangements are available on the Namibia Training Authority website [www.nta.com.na](http://www.nta.com.na).

## **Elements and Performance Criteria**

### **Element 1: Plan and prepare for work**

#### **Range**

Planning and preparation may include but is not limited to workplace inspection, equipment defect identification, assessment of conditions and hazards and determination of work requirements.

Tools and equipment may include but are not limited to standard tool set, special tools and testing equipment (including multimeter, induction ammeter, ohmmeter, tachometer and oscilloscope), soldering equipment as per manufacturers' requirements.

Materials may include but are not limited to spare parts, soldering consumables and cleaning material.

#### **Performance Criteria**

- 1.1 Work instructions, including repair order forms, specifications and operational details are obtained, confirmed and applied.
- 1.2 Safety requirements are followed in accordance with safety plans and policies.
- 1.3 Tools and equipment selected to carry out tasks are consistent with the requirements of the job, checked for serviceability and any faults rectified or reported prior to commencement.
- 1.4 Material requirements are identified and obtained in accordance with repair order form and/or specifications.
- 1.5 Materials are safely handled and located ready for use in line with workplace procedures.
- 1.6 Technical and/or calibration requirements for tools and equipment are sourced and implemented in line with workplace procedures.
- 1.7 Environmental protection requirements are identified and applied, in line with environmental plans and regulatory obligations.

## **Element 2: Test charging system components**

### **Range**

Testing methods may include but are not limited to reading and interpreting wiring diagrams, interpretation of readings related to faults where the cause may be direct, indirect or intermittent, diagnosing, functional testing, measurements, visual, aural and functional assessment (including damage, corrosion, electrical short or broken circuit and wear) in line with manufacturers' specifications.

Faults may include but are not limited to system not charging, alternator or generator drive problems limited to v-belt alignment and mounting, regulator malfunction, and external alternator or generator faults, including open, short and ground circuits.

### **Performance Criteria**

- 2.1 Procedures and information required for testing charging system components are identified and sourced in line with workplace procedures.
- 2.2 Testing is implemented according to workplace procedures and manufacturers' specifications.
- 2.3 Faults are identified and documented with evidence and supporting information.
- 2.4 Testing results are compared with manufacturers' specifications.
- 2.5 Conditional report and recommendation made are forwarded to appropriate personnel in line with workplace procedures.

## **Element 3: Repair charging system and/or associated components**

### **Range**

Repair operations may include but are not limited to reading and interpreting wiring diagrams, fault finding using aural, visual and functional assessment for damage, corrosion, wear and electrical short or broken circuits, electrical measurements, diagnosis and determining faults, pre-and post-repair testing of system and component operation, removal and replacement of external alternator and generator components, repair of system components, repair adjustments in line with manufacturers' specifications.

### **Performance Criteria**

- 3.1 Procedures and information required for repairing the charging system and/or associated components are identified and sourced in line with workplace procedures.
- 3.2 Repair operations are implemented according to workplace procedures and manufacturers' specifications.
- 3.3 Adjustments made during the repair are undertaken in line with manufacturers' specifications.

- 3.4 Final charging system performance test is conducted and results compared with manufacturers' specifications.

#### **Element 4: Complete work and clean up**

##### **Range**

Work completion details may include but are not limited to repair order form, sign-out form for equipment, service record book and service plan form.

##### **Performance Criteria**

- 4.1 Work is completed and appropriate personnel notified in accordance with workplace procedures.
- 4.2 Work area is cleared of waste, cleaned, restored and secured in accordance with workplace procedures.
- 4.3 Reusable material is collected and stored in accordance with workplace procedures.
- 4.4 Equipment used is cleaned, checked, maintained and stored in accordance with workplace procedures.
- 4.5 Work completion details are finalised in accordance with workplace procedures.

#### **Registration Data**

<b>Subfield:</b>	Automotive Engineering
<b>Date first registered:</b>	15 November 2007
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<b>Body responsible for review:</b>	Namibia Training Authority