

<b>Unit ID: 213</b>	
<b>Domain</b>	<b>AUTOMOTIVE MECHANICS</b>
<b>Title:</b>	<b>Test and service solid state ignition system of a motor vehicle</b>
<b>Level: 3</b>	<b>Credits: 4</b>

### Purpose

This unit standard specifies the competencies required to test and service solid state ignition system of a motor vehicle. It includes testing and servicing of a solid state ignition system and/or associated parts. This unit standard is intended for those who work as automotive mechanics.

### 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. To demonstrate competence, at a minimum, evidence is required of testing and servicing a solid state ignition system. This task includes locating and repairing two (2) circuit faults and conducting a final performance test according to the manufacturers' specifications.
3. Assessment evidence may be collected from a real workplace or a simulated real workplace or an appropriate simulated realistic environment in which automotive mechanics operations are carried out.
4. Performance of all elements in this unit standard must comply with manufacturers' specifications, workplace specific requirements and reasonable flat rate time.
5. Glossary of terms:
  - '*solid state*' means electronic device or assembly with no moving parts
  - '*specifications*' refers to any, or all of the following: manufacturers' specifications and recommendations, workplace specific requirements
  - '*service operations*' refers to 'on-vehicle service' where operations can be directly performed on the vehicle and 'component repair' where the operations are done on the workbench after removing the component from the vehicle
  - '*solid state ignition system*' refers to electronic ignition systems, which are not associated with an engine management system.
6. 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.
7. This unit standard applies to passenger and light commercial vehicles with a Gross Vehicle Mass  $\leq 5\,500$  kg (Petrol).

## **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, ohmmeter, tachometer, timing light, engine analyser) as per manufacturers' requirements.

Materials may include but are not limited to spare parts 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 and assess solid state ignition system**

### **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, spark discharge, electrical short or broken circuit, wear) in line with manufacturers' specifications.

Faults may include but are not limited to difficult engine starting or no starting, engine misfiring, poor engine performance, overheating.

### **Performance Criteria**

- 2.1 Procedures and information required for testing a solid state ignition system are identified and sourced in line with workplace procedures.
- 2.2 Testing is implemented according to workplace procedures and manufacturers' specifications.
- 2.3 Testing results are compared with manufacturers' specifications.
- 2.4 Faults are identified and documented with evidence and supporting information and recommendation(s) is made in line with workplace procedures.
- 2.5 Report is forwarded to appropriate personnel according to workplace procedures.

## **Element 3: Service ignition system and/or associated parts**

### **Range**

Service operations may include but are not limited to isolation of faults, removing and installing, disassembling and assembling, inspection and evaluation, adjustments, operational testing, repair, replacement and visual inspections in line with manufacturers' specifications.

System and associated parts may include but are not limited to spark plug service (including spark plug appearance and electrode gap setting), high tension leads (including firing order and electrical contact), distributor service (including distributor removal and installation, cap and rotor inspection), dynamic timing setting, ignition switch, high performance coil, pulse generator assembly and ignition module.

### **Performance Criteria**

- 3.1 Procedures and information required for servicing a solid state ignition system are identified and sourced in line with workplace procedures.
- 3.2 Service operations are implemented according to workplace procedures and manufacturers' specifications.
- 3.3 Adjustments made during the service are undertaken in line with manufacturers' specifications.

- 3.4 Final ignition 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>	29 March 2007
<b>Date this version registered:</b>	29 March 2007
<b>Anticipated review:</b>	2010
<b>Body responsible for review:</b>	Namibia Training Authority