

<b>Unit ID: 224</b>	
<b>Domain Title:</b>	<b>AUTOMOTIVE MECHANICS Inspect and service engine-forced induction system</b>
<b>Level: 4</b>	<b>Credits: 4</b>

### Purpose

This unit standard specifies the competencies required to inspect and service an engine-forced induction system. It includes the inspection, assessment and servicing of engine-forced induction system and/or associated components. 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 inspecting, assessing and servicing an engine-forced induction system according to manufacturers' specifications comprising the replacement and necessary adjustment of two (2) of the following system components:
  - turbocharger
  - supercharger
  - oil cooler
  - waste gate
  - air bypass valve
  - actuator
  - intercooler
  - coolant, oil and air pipes and hoses.
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:
  - '*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
  - '*engine-forced induction system*' refers to turbocharger and supercharger systems.
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 & Diesel).

### **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, meters, gauges, special tools and equipment as per manufacturers' requirements.

Materials may include but are not limited to spare parts, lubricants, and cleaning materials.

#### **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: Inspect and assess engine-forced induction system**

### **Range**

Inspection methods are to include but are not limited to functional testing, measurements, visual, aural and functional assessment (including damage, corrosion, leakage, wear) in line with manufacturers' specifications.

### **Performance Criteria**

- 2.1 Procedures and information required for inspecting and assessing an engine-forced induction system are identified and sourced in line with workplace procedures.
- 2.2 Inspection methods are implemented according to workplace procedures and manufacturers' specifications.
- 2.3 Inspection results are compared with manufacturers' specifications.
- 2.4 Results are 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 engine-forced induction system and/or associated components**

### **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, lubrication, repair, replacement and visual inspections in line with manufacturers' specifications.

System and associated components may include but are not limited to turbocharger and supercharger systems (including oil cooler, waste gate, air bypass valve, actuator, intercooler, and coolant, oil and air pipes and hoses).

### **Performance Criteria**

- 3.1 Procedures and information required for service operations of an engine-forced induction 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 operations are undertaken in line with manufacturers' specifications.

- 3.4 Unexpected or unplanned contingencies that are encountered in servicing engine-forced induction systems are addressed through applying workplace procedures, previous experience and manufacturers' technical information.
- 3.5 Final 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
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