

Unit ID: 2226

Domain

**PRECISION MACHINING AND FITTING**

Title:

**Overhaul engines**

Level: 4

**Credits: 15**

### Purpose

This unit standard is intended for those who overhaul engines. People credited with this unit standard are able to demonstrate knowledge of engine components, perform engine inspection, disassemble and assemble engine components, carryout engine assembly, carryout cylinder head repairs, and conduct engine tests.

This unit standard is intended for those who work in automotive mechatronics environment.

### Special Notes

1. Entry information

Prerequisite

- *none*

2. This unit standard is to be assessed in the context of industrial safety operations and should be assessed in conjunction with other relevant technical unit standards selected from this domain.

3. Assessment evidence may be collected at a real workplace or simulated workplace in which safety operations are carried out.

4. Glossary of terms:

- '*Specifications*' refers to any, or all the following: manufacturers' specifications and recommendations, workplace specific requirements, national and international standards and legislations
- '*ISO*' refers to International Organization for Standards

5. Performance of all elements in this unit standard must comply with industry standards and workplace requirements.

6. Regulations and legislation relevant to this unit standard include the following:

- Labour Act No. 11 of 2007
- Regulations relating to the health and safety of employees at work under Schedule 1 (2) of the Labour Act No.11 of 2007.
- ISO 14001 (Environmental Management Standard) and all subsequent amendments to any of the above.

## **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 on [www.namqa.org](http://www.namqa.org) and the Namibia Training Authority on [www.nta.com.na](http://www.nta.com.na).

## **Elements and Performance Criteria**

### **Element 1: Demonstrate knowledge of engine components**

#### **Performance Criteria**

- 1.1 Different engine components are listed.
- 1.2 Functions of different engine components are identified and explained.
- 1.3 Relationship of different engine components is described.

### **Element 2: Perform engine inspection**

#### **Performance Criteria**

- 2.1. Engine inspection documents are read and confirmed in line with workplace procedures.
- 2.2. Inspection guidelines are interpreted according to manufacturers' specifications.
- 2.3. Engine is inspected according to manufacturers' specifications and workshop manual specifications.
- 2.4. Leaks are detected and listed according to workplace procedures.
- 2.5. Defects and malfunctions are identified and recorded according to manufactures or workshop manuals.

### **Element 3: Disassemble and assemble engine components**

#### **Performance Criteria**

- 3.1. Engine components to be disassembled are identified and marked according to workplace procedures.
- 3.2. Engine components are disassembled and all bolts, nuts, washers and screws are stored in designated storage and in line with workplace procedures.

- 3.3. Engine components are checked for functionality, wear and tear.
- 3.4. New engine components are assembled according to manufacturer's or workshop manuals.
- 3.5. Engine components are fitted with replacement parts and accessories according to manufacturer's or workshop manuals.
- 3.6. Final checks of engine components functionality are conducted according to manufacturer's or workshop manuals.

#### **Element 4: Carryout engine assembly**

##### **Performance Criteria**

- 4.1. Engine block is inspected for cracks, wear and tear according to workshop manual specifications.
- 4.2. Replacement parts and accessories are identified and recorded according to workplace procedures.
- 4.3. Repairs to be done on the engine block are identified and recorded.
- 4.4. Engine block repairs are checked according to workplace procedures and manufacturers' specifications.
- 4.5. Engine parts and accessories are replaced according to workplace procedures and manufacturers' specifications.

#### **Element 5: Carryout cylinder head repairs**

##### **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.

A cylinder head accessory includes and is not limited camshaft, valves, valve guides, valve lifters or pushrods, studs and rocker arm.

##### **Performance Criteria**

- 5.1. Cylinder head is checked for flatness and cracks in line with manufacturers' specifications and workplace procedures.
- 5.2. Cylinder head accessories are checked for wear and tear according to manufacturers' specifications and workplace procedures.
- 5.3. Camshaft and bearings are checked for run out, cam lobe height, oil clearance and thrust clearance in line with manufacturers' specifications and workplace procedures.

- 5.4 Cylinder head is assembled without causing damage to any component or system in line with manufacturers' specifications and workplace procedures.
- 5.1 Cylinder head is mounted and torque is set to specification in line with manufacturers' recommendations.
- 5.2 Final adjustments are made in line with manufacturers' specifications and workplace procedures.

**Element 6: Conduct engine tests**

**Performance Criteria**

- 6.1 Different engine tests are identified.
- 6.2 Engines are tested according to manufacturer's specifications.
- 6.3 Results of engine tests are recorded according to workplace procedures.

**Registration Data**

<b>Subfield:</b>	Automotive Engineering
<b>Date first registered:</b>	22 April 2020
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<b>Body responsible for review:</b>	Namibia Training Authority