

Domain	AUTOMOTIVE MECHANICS	Unit ID: 206
Title:	Overhaul engine cylinder head	
Level: 3		Credits: 5

Purpose

This unit standard specifies the competencies required to overhaul an engine cylinder head. It includes dismantling and inspecting the cylinder head, reconditioning valves and valve seats and reassembling the cylinder head. 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 dismantling and assembling one (1) cylinder head (cast iron or aluminium) including inspecting of component parts and reconditioning of any two (2) valves and valve seats in compliance with manufacturers' guidelines and 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:
 - '*specifications*' refers to any, or all of the following: manufacturers' specifications and recommendations, workplace specific requirements.
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.

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 including torque wrench, power tools, special equipment (e.g. valve facer, seat cutter etc.), measuring equipment, testing equipment, gasket seals.

Materials may include but are not limited to lubricants, spare parts 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: Dismantle cylinder head

Range

Cleaning of component parts is limited to using appropriate solvents and procedures in compliance with workplace guidelines, environmental legislation and occupational health and safety requirements.

Performance Criteria

- 2.1 Correct method for dismantling cylinder head is accessed and interpreted from manufacturers' specifications.
- 2.2 Cylinder head is dismantled using approved methods, tools and equipment without causing damage to any component or system in line with workplace procedures.
- 2.3 Component parts are cleaned in preparation for evaluation in line with workplace procedures.

Element 3: Inspect cylinder head and components

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

- 3.1 Manufacturers' specifications are sourced using workshop manuals and other standards reference materials.
- 3.2 Cylinder head bolts diameter and length are measured in line with manufacturers' specifications and workplace procedures.
- 3.3 Cylinder head is checked for flatness and cracks in line with manufacturers' specifications and workplace procedures.
- 3.4 Valve stems and guide bushings are measured in line with manufacturers' specifications and workplace procedures.
- 3.5 Valve lifters or pushrods, studs and rocker arm are inspected for wear in line with manufacturers' specifications and workplace procedures.
- 3.6 Valve length and valve head margin thickness is measured in line with manufacturers' specifications and workplace procedures.
- 3.7 Valve seat contact is checked in line with manufacturers' specifications and workplace procedures.
- 3.8 Valve springs are measured for length and checked for squareness in line with manufacturers' specifications and workplace procedures.

- 3.9 Camshaft and bearings are checked for run out, cam lobe height, oil clearance and thrust clearance in line with manufacturers' specifications and workplace procedures.

Element 4: Recondition valves and valve seats

Range

Test results are recorded and compared with manufacturers' specifications.

Performance Criteria

- 4.1 Valves are refaced in line with manufacturers' specifications and workplace procedures.
- 4.2 Valves seats are hand-lapped in line with manufacturers' specifications and workplace procedures.
- 4.3 Final valve seating position is checked in line with manufacturers' specifications and workplace procedures.
- 4.4 Leakage test on valve seating is conducted in line with manufacturers' specifications and workplace procedures.

Element 5: Assemble cylinder head

Range

Final adjustments may include but are not limited to valve clearance adjustments.

Performance Criteria

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

Element 6: 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

- 6.1 Work is completed and appropriate personnel notified in accordance with workplace procedures.
- 6.2 Work area is cleared of waste, cleaned, restored and secured in accordance with workplace procedures.
- 6.3 Reusable material is collected and stored in accordance with workplace procedures.
- 6.4 Equipment used is cleaned, checked, maintained and stored in accordance with workplace procedures.
- 6.5 Work completion details are finalised in accordance with workplace procedures.

Registration Data

Subfield:	Automotive Engineering
Date first registered:	29 March 2007
Date this version registered:	29 March 2007
Anticipated review:	2010
Body responsible for review:	Namibia Training Authority