

ESWATINI GOVERNMENT
NATIONAL TRADE STANDARD
APPROVED BY THE INDUSTRIAL TRAINING BOARD FOR
TRADE TESTING IN THE TRADE/OCCUPATION
OF
MOTOR CYCLE MECHANIC

1. Job Title: Motor Cycle Mechanic

2. Job Description: Repairs, services and overhauls motor cycles and examines machines to ascertain nature extent and location of defects. Plans work, or works under supervision, using manufacturers' charts and/or technical manuals. Dismantles engines, gearboxes, transmission or other parts requiring attention. Repairs or replaces parts such as pistons, rods, gears, valves, gaskets, spark plugs, brake shoes and disc pads, etc. Fits new bushes or bearings to swinging arm suspension mechanisms. Tunes engines by adjusting ignition, carburettor, valves and timing mechanism. Repairs, using oxy/acetylene equipment, minor frame defects and defects in fittings. Carries out auto-electrical repairs and tests machines on the road.

3. Classification of Grades:

- **Grade I:** Highly skilled level
- **Grade II:** Skilled level
- **Grade III:** Semi-skilled level

4. Performance Standards

(a) Practical Skill Requirements Grade III

Every applicant must be able to:

1. Observe all safety precautions - personal and equipment.
2. Use simple measuring instruments common to the trade.
3. Use and maintain in good condition the tools in common use in the trade.
4. Carry out repairs such as brake adjustment, cable adjustment and unit replacement, etc.

5. Carry out minor service on four and two stroke engines working from manufacturers service charts.
6. Check and clean contact breaker points and sparking plugs and make correct gap clearances on single cylinder engines.
7. Decarbonise a cylinder head and grind in valves.
8. Carry out drive chain replacement and adjustment.
9. Use splint pins and other locking devices.
10. Adjust brakes and clutches, change disc pads and brake shoes.
11. Fit and remove tyres, mend punctures and inflate tyres to the correct pressures.
12. Check battery acid/distilled water level and use a hydrometer.
13. Check and adjust wheel alignment.
14. Identify metals in common use in the trade.
15. Identify components from exploded diagrams.
16. Replace bulbs.

(b) Tools and Equipment Requirements Grade III

Every applicant should have in his possession and/or be able to use tools and equipment supplied as follows:

Spanners, Hammers, Pliers, Feeler gauges, Punches, Screwdrivers, Torque wrench, Allen keys, Soldering iron, Hacksaw, Files, Cold chisels, Side cutters, Vice-grip, Rule, Suction cup, Hand drill, Power drill, Valve spring compressor, Oil can, Rubber mallet, Socket spanners, Calipers, Grease gun, Dividers and scribe.

Plus any allied tools and equipment required to carry out the practical requirements satisfactorily.

(c) Related Knowledge Requirements Grade III

Every applicant must have a knowledge of:

1. Safety precautions - personal and equipment.
2. First-aid treatment for electric shock and minor workshop injuries.
3. The common simple measuring instruments and devices used in the trade and their various applications.
4. The various types of fire extinguishers and their different applications.

Trade test standards are available at www.divt.org.sz/trade-testing/

5. Mechanical and hydraulic brake systems.
 6. The working principles of the internal combustion engine, both four and two-stroke.
 7. Gear boxes and mechanical drive trains.
 8. Starter motors and alternators (rotating magnet type).
 9. Gap clearance in relation to contact points and sparking plugs.
 10. Various locking devices and their application.
 11. All major frame components and their location on the machine.
 12. Tyres, tyre pressures and wear patterns and their effect on machine handling.
 13. Manufacturers service charts and how to use them.
 14. Wheel alignment.
 15. Lubricants used in the maintenance of motor cycles.
 16. Spanner sizes and the common types of threads used in the trade.
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(a) Practical Skill Requirements Grade II

In addition to fulfilling the Grade III requirements, every applicant must be able to:

1. Use and read a micrometer.
2. Use drills, taps and dies.
3. Remove and replace broken studs and seized nuts.
4. Set and adjust ignition timing on multi-contact breaker systems.
5. Use oxy/acetylene equipment to repair non-stressed frame fittings.
6. Carry out repairs to simple carburettors, filters and fuel lines and adjust simple single carburettors.
7. Check and straighten small bends in front fork stanchions.
8. Locate and diagnose faults in an engine, gearbox, transmission, steering and suspension system.
9. Trace defects in an ignition system.
10. Dismantle and reassemble clutch units.
11. Fit new bearings, bushes, rings and pistons with the required clearance for these components.

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12. Overhaul front and rear suspension assemblies and fit new bearings/bushes to the swinging arm.
13. Use a valve refacing machine.
14. Set and check valve timing with marks.
15. Use and read correctly vacuum and compression gauges.
16. Read and use manufacturers service charts and workshop manuals.
17. Carry out simple electrical faults diagnosis and repairs.
18. Overhaul and set up constant stop gearboxes.
19. Overhaul and adjust auto-lube and posi-lube two stroke lubrication systems.
20. Set disc-valve port timing using manufacturers data.
21. Carry out a complete overhaul of mechanical and hydraulic braking systems.
22. Shorten cables and resolder cable nipples.
23. Carry out a complete top overhaul on multi-cylinder engines.
24. Carry out a complete overhaul on single cylinder engines.
25. Fit new spokes to wheels and true wheels.

(b) Tools and Equipment Requirements Grade II

Every applicant should have in his possession and/or be able to use tools and equipment supplied as for Grade III plus any tools and equipment required to carry out the practical skill requirements satisfactorily.

(c) Related Knowledge Requirements Grade II

In addition to fulfilling the Grade III requirements, every applicant must have a sound knowledge of:

1. The uses, care and maintenance of precision gauges used in the trade.
2. Four and two-stroke lubrication systems.
3. Two-stroke disc and reed valves.
4. Carburettors, filters and fuel lines and the logical sequence to be followed when diagnosing faults in ignition systems.
5. Clutch units of the single-plate diaphragm and multi-plate type.
6. Front and rear suspension of various types.

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7. Valve and cylinder clearances.
 8. Manufacturers service charts and mechanical drawings and their interpretation.
 9. Hydraulic brake systems.
 10. All types of bearings in common use in the trade including clearance, adjustment and pre-load.
 11. Spoked wheel design.
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(a) Practical Skill Requirements Grade I

In addition to fulfilling the Grade II and Grade III requirements, every applicant must be able to:

1. Set ignition timing on multi-cylinder engines fitted with electronic ignition.
2. Diagnose and locate any fault on a motor cycle.
3. Measure frames and check for correct geometry.
4. Carry out a complete overhaul of any motor cycle and make any necessary repairs or adjustments.
5. Carry out a complete machine test and prepare a serviceability report.
6. Estimate repair times.
7. Service and/or overhaul anti-lock braking systems.
8. Grind tappets and rocker arm faces accurately to prescribed limits.
9. Demonstrate a specialist skill in at least one of the following: Fuel injection equipment, electronic diagnostic equipment, cylinder boring, crankshaft grinding, electronic dynamometer testing.
10. Service and adjust multi-carburettor systems using a bank of vacuum gauges.
11. Using oxy/acetylene equipment to carry out minor repairs to frames.
12. Test alternator charging systems and trace faults.

(b) Tools and Equipment Requirements Grade I

Every applicant should have in his possession and/or be able to use tools and equipment supplied as specified for Grade III plus any other tools and equipment required to carry out the practical skill requirements satisfactorily.

(c) Related Knowledge Requirements Grade I

In addition to fulfilling the Grade II and Grade III requirements, every applicant must have a sound knowledge of:

1. Frame materials, stress points and their repair.
2. Clearances and fits in relation to pistons, rings, bearings and gearboxes.
3. The principles and function of anti-lock brake systems.
4. The electrical systems of motor cycles.
5. Fuel injection equipment.
6. The procedures to be followed for a complete machine test and the preparation of a serviceability report.
7. The calculations involved in the estimation of repair times.
8. His chosen specialist skill.

5. Quality Standards

The degree of accuracy required for a practical test will be clearly stated on the test question paper and will be closely allied to the demands of the occupation at each grade classification.

6. Minimum Requirements for Applicants wishing to take a Trade Test:

Grade III

- **Minimum Age:** 18 years
- **Work Experience:** At least three years employment in the trade/occupation. Any period spent at an approved technical training institution in study of such trade/occupation shall be deemed to be employment.

Grade II

- **Work Experience:** At least two years employment in the Trade/occupation after the date of obtaining a Grade III trade test certificate.

Grade I

- **Work Experience:** At least two years employment in the Trade/occupation after the date of obtaining a Grade II trade test certificate.