

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

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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. Diagnose and locate any fault in an automotive or similar motor vehicle.
2. Carry out complete overhaul of any motor vehicle and make any necessary repairs or adjustments.
3. Carry out complete vehicle test and prepare a serviceability report.
4. Estimate repair times.
5. Service and or overhaul a servo assisted braking system.
6. Grind tappets and rocker arm faces accurately to prescribed limits.
7. Demonstrate a specialist skill in at least one of the following: automatic transmissions; fuel injection equipment (P.I. or diesel); air conditioning; electric diagnostic equipment on components such as starter motor and alternator; cylinder boring; crankshaft grinding; air braking system; general hydraulic; power steering.

**b) Tools and Equipment Requirements Grade I**

Every applicant should have in his possession and/or be able to use tools and equipment supplies as specified for Grade II and 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. Clearances and fits in relation to pistons, rings, bearing, crown wheel and pinion, steering assemblies and differentials.
2. The principles and functions of servo assisted brake systems.
3. The electrical system of an automobile or similar motor vehicle.
4. Fuel injection equipment.
5. Automatic gear boxes and torque convertors.
6. The procedures to be followed for a complete vehicle test and preparation of serviceability report.
7. The calculations involved in the estimation of repair time.
8. His chosen specialist skill.



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a) Practical Skill Requirements Grade II

In addition to fulfilling the Grade III requirement:

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. Carry out repairs to fuel pumps, simple carburettors, filters and fuel lines and adjust a simple carburettor.
5. Locate and diagnose faults in an engine, gear box, axle, steering and transmission on conventional motor vehicles.
6. Trace defects in ignition circuits.
7. Fit new bearings, bushes, rings and pistons with the required clearances for these components.
8. Fit new bearings, bushes, rings and pistons with the required clearances for these components.
9. Overhaul front and rear axle assemblies and fit new king pins and bushes.
10. Use a valve refacing machine.
11. Set and check valve timing with marks.
12. Use and read correctly vacuum and compression gauges and cylinder bore gauges.
13. Read and use manufacturers service charts and workshop manuals.
14. Carry out simple electrical faults diagnosis and repairs.

15. Overhaul and set up crash, constant-mesh and synchro-mesh gear boxes with the aid of a service manual.
16. Replace and time a phased injector pump and replace injector nozzles.
17. Carry out a complete overhaul of hydraulic brake systems.
18. Carry out a complete top overhaul.

b) Tools and Equipment Requirements Grade II

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

c) Related Knowledge Requirements Grade II

In addition to fulfilling the Grade 111 requirements:

Every applicant must have a sound knowledge of:

1. Types and uses of power tools used in the trade and the safety precautions applicable to their use.
2. The uses, care and maintenance of precision gauges used in the trade.
3. Fuel pumps, carburettors, filters and fuel lines and the logical sequence to be followed when diagnosing faults in these components.
4. Engine, gear box, axle, steering and transmission layouts.
5. Ignition circuits and the logical sequence to be followed when diagnosing faults in ignition circuits.
6. Clutch units of various types.
7. Front and rear axle assembled of various types.
8. Valve and cylinder clearances.
9. Manufacturers service charts and mechanical drawings and their interpretation.
10. Motor vehicle electrical circuits.
11. Diesel injector pumps and injectors.
12. Hydraulic brake systems.
13. All types of bearings in common trade use including adjustment and clearance and adjustment and pre-load where necessary.

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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, gearbox removal, unit replacement, etc.
5. Carry out a minor service on a petrol and/or diesel engine vehicle, including changing of filters, cleaning the fuel system, etc, working from manufacturers service charts.
6. Check and clean contact breaker points and sparking plugs and make correct gap clearances.
7. Decarbonise a cylinder head and grind in valves.
8. Use split pins and other locking device.
9. Fit and adjust all chassis components such as springs and shackles, etc.
10. Adjust brakes and clutches, change brake shoes.
11. Set the firing orders of 4 and 6 cylinder in-line engines.
12. Fit and remove tyres, mend punctures and inflate tyres of light vehicles to the correct pressures.
13. Check battery acid levels and use a hydrometer.
14. Check and adjust toe-in.

15. Identify metals in common use in the trade.

16. Identify components from exploded diagrams.

b) Tools and Equipment Requirements Grade III

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

|               |               |                 |
|---------------|---------------|-----------------|
| spanners      | Hammers       | Pliers          |
| feeler gauges | Punches       | Screwdrivers    |
| Torque Wrench | Allen keys    | Soldering iron  |
| Hacksaw       | Files         | Cold chisels    |
| Side cutters  | Vice-grip     | Rule            |
| Hand drill    | Power drill   | Pipe wrench     |
| Oil can       | Rubber mallet | Suction cup     |
| Calipers      | Grease gun    | Valve lifter    |
|               | Hydrometer    | Socket spanners |
|               |               | Dividers        |

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

c) Related Knowledge Requirement 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.
5. Mechanical and hydraulic brake systems, gear boxes, starter motors, etc.
6. The working principles of internal combustion engines and vehicles layout.
7. The logical sequence to be followed when carrying out minor servicing on petrol and diesel engines.

8. Cap clearances in relation to contact breaker points and sparking plugs.
9. Valve clearances.
10. Various locking devices and their application.
11. All major chassis components and their locations on a vehicle.
12. The firing orders of 4 and 6 cylinder in-line engines.
13. Tyres, tyre pressures and wear patterns and their effect on vehicle handling.
14. Manufacturers service charts and how to use them.
15. Wheel alignment.
16. Lubricants used in the maintenance of motor vehicle.
17. Spanners sizes and the common types of threads used in the trade.



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