

TRANSPORTATION AND LOGISTICS

Automobile Technology



WorldSkills Occupational Standards

WorldSkills Occupational Standards (WSOS)

General notes on the WSOS

The WSOS specifies the knowledge, understanding, and specific skills that underpin international best practice in technical and vocational performance. It should reflect a shared global understanding of what the associated work role(s) or occupation(s) represent for industry and business (www.worldskills.org/WSOS).

The skill competition is intended to reflect international best practice as described by the WSOS, and to the extent that it is able to. The Standard is therefore a guide to the required training and preparation for the skill competition.

In the skill competition the assessment of knowledge and understanding will take place through the assessment of performance. There will only be separate tests of knowledge and understanding where there is an overwhelming reason for these.

The Standard is divided into distinct sections with headings and reference numbers added.

Each section is assigned a percentage of the total marks to indicate its relative importance within the Standards. This is often referred to as the “weighting”. The sum of all the percentage marks is 100. The weightings determine the distribution of marks within the Marking Scheme.

Through the Test Project, the Marking Scheme will assess only those skills that are set out in the Standards Specification. They will reflect the Standards as comprehensively as possible within the constraints of the skill competition.

The Marking Scheme will follow the allocation of marks within the Standards to the extent practically possible. A variation of up to five percent is allowed, provided that this does not distort the weightings assigned by the Standards.

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| Section | Relative importance (%) |
|---|-------------------------|
| 1 Work organization and management | 10 |

The individual needs to know and understand:

- The purposes, uses, care, maintenance of all equipment, materials, and fluids, together with their risks and safety implications
- The difficulties and risks associated with related activities, together with their causes and methods of prevention
- The time management and parameters associated with each activity
- Sustainable environment, health, and work safety principles and their application in the work environment

The individual shall be able to:

- Prepare and maintain safe, tidy, and efficient workstations
- Prepare self for the tasks in hand, including full regard for health, safety, and environment
- Plan, prepare, and complete each task within the time available
- Schedule work to maximize efficiency and avoid disruption
- Select and use all equipment and materials safely and in compliance with manufacturers' instructions
- Clean, store, and test all equipment and materials safely and in compliance with manufacturers' instructions
- Apply or exceed the health, safety, and environment standards applying to the environment, equipment, and materials
- Restore work areas and vehicles to appropriate states and conditions

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|---|-----------|
| 2 Communication and interpersonal skills | 10 |
|---|-----------|

The individual needs to know and understand:

- The range and purposes of documentation, including written and technical drawings including schematic and wiring diagrams, in both paper based and electronic forms
- The technical language associated with the skill
- The industry standards required for inspection and reporting in oral, written, and electronic formats
- The required standards for customer service and care

| Section | Relative importance (%) |
|---------|-------------------------|
|---------|-------------------------|

The individual shall be able to:

- Read, interpret, and extract technical data and instructions from workshop manuals in any available format
- Communicate in the workplace by written and electronic means, using standard formats
- Communicate in the workplace by oral, written, and electronic means to ensure clarity, effectiveness, and efficiency
- Use a standard range of communication technologies
- Complete reports and respond to issues and questions arising
- Respond to customers' needs face to face and indirectly

| | | |
|----------|---|-----------|
| 3 | Electrical and mechanical systems, and their integration | 25 |
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The individual needs to know and understand:

- Spark Ignition and Compression Ignition engine management systems
- Engine mechanical systems
- Hybrid/electric vehicle systems
- Forced induction, emission, and exhaust systems
- Body electrical and electronic systems
- Braking and stability control systems
- Suspension and steering systems
- Drive line systems
- HVAC systems
- Air bag and safety restraint systems (SRS)
- Consumer electronics (entertainment systems ETC)
- How each system is interconnected and can have an effect on other systems
- How sensors and information are shared between various management systems

The individual shall be able to:

- Use test equipment to measure, check, and diagnose systems for mechanical and/or electronic faults
- Perform tests to identify and isolate faults

| | | |
|----------|---------------------------------|-----------|
| 4 | Inspection and diagnosis | 35 |
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The individual needs to know and understand:

- The correct use and interpretation of relevant measuring devices and equipment
- The principles and applications of all relevant numerical and mathematical calculations
- The principles and applications of specialist diagnostic procedures, tooling, and equipment

| Section | Relative importance (%) |
|--|-------------------------|
| <p>The individual shall be able to:</p> <ul style="list-style-type: none"> • Calibrate and use all measuring devices and equipment (mechanical and electrical) for diagnosis • Determine the precise location of component faults within a range of light vehicle systems • Select and apply the appropriate devices and equipment to make inspections and diagnose deficiencies and faults to: <ul style="list-style-type: none"> • Spark ignition systems • Compression ignition systems • Forced induction, emission, and exhaust systems • Body electrical/electronic systems • Braking and stability control systems • Suspension and steering systems • Drive line systems • Calculate, check, and interpret results as required • Review the options for repair or replacement | |
| 5 Repair, overhaul, and service | 20 |

The individual needs to know and understand:

- The options for repair or replacement
- Repair methods/procedures
- Requirements for special tools
- The effects of repairs or replacement on other vehicle systems and associated repair work

| Section | Relative importance (%) |
|---|-------------------------|
| <p>The individual shall be able to:</p> <ul style="list-style-type: none"> • Use manufacturers' and component suppliers' specification as required • Construct, justify and communicate appropriate proposals and decisions regarding repair or replacement • Use correct procedures for securing replacement parts • Repair vehicle electrical systems and electrical circuits, repair/overhaul charging, and starting systems • Repair/overhaul hydraulic braking systems (disc and drum) and/or associated components, including hand or parking brakes • Repair electronically controlled antilock brakes and stability control systems • Remove/overhaul driveline components • Repair/overhaul steering systems/components, including mechanical, electrical, and hydraulic power assisted steering systems • Repair suspension systems and associated components • Carry out steering wheel alignment operations • Repair/overhaul four stroke engines and associated engine components • Repair/overhaul manual/automatic transaxles/transmissions and components • Repair diesel fuel systems including electronic compression ignition engine management systems and associated components | |
| Total | 100 |

References for industry consultation

WorldSkills is committed to ensuring that the WorldSkills Occupational Standards fully reflect the dynamism of internationally recognized best practice in industry and business. To do this WorldSkills approaches a number of organizations across the world that can offer feedback on the draft Description of the Associated Role and WorldSkills Occupational Standards on a two-yearly cycle.

In parallel to this, WSI consults three international occupational classifications and databases:

- ISCO-08: (<http://www.ilo.org/public/english/bureau/stat/isco/isco08/>) ILO 3115
- ESCO: (<https://ec.europa.eu/esco/portal/home>)
- O*NET OnLine (www.onetonline.org/)

This WSOS appears to relate to *Automotive Master Mechanics*:

<https://www.onetonline.org/link/summary/49-3023.01>

and partly to *Automotive Engineering Technician*:

<http://data.europa.eu/esco/occupation/444c9aa9-578d-4a9a-9949-99ef1bacb20e>

Adjacent occupations may also be explored through these links.

The following table indicates which organizations were approached and provided valuable feedback for the Description of the Associated Role and WorldSkills Occupational Standards in place for WorldSkills Shanghai 2021.

| Organization | Contact name |
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| National Institute for Automotive Service Excellence - ASE (North America) | John Tisdale, Assistant Vice President, Special Testing Programs |