

Technical Description

Automobile Technology

Skill 33



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1 Introduction

1.1 Name and description of the skill competition

1.1.1 The name of the skill competition is

Automobile Technology

1.1.2 Description of the associated work role(s) or occupation(s)

The modern Light Vehicle Automobile Technician is likely to be employed in a workshop that is closely associated with one major manufacturer of light vehicles. His/her expertise may be greatest with that manufacturer's vehicles; however, depending on the situation and range of services offered by the workshop, he/she may also handle other manufacturers' vehicles. Automobile Technicians also work in garages and workshops that are not associated with manufacturers. Where this is the case, they may experience a wider range of light vehicles and use alternative equipment, parts, and materials.

The trained and competent Light Vehicle Automobile Technician will service and repair a range of light vehicles. For diagnosis, repair, and replacement, depending on the nature of the workshop, he/she may use the manufacturers' equipment, parts, materials, and procedures. Therefore, according to a workshop's relationship with manufacturers, the Technician's experience may be deep or broad, or both. In every garage and workshop success is measured in time, correct fault finding and repair, and repeat business.

Most garages and workshops are small businesses or cost centres that work to tight financial parameters. The light automobile sector is volatile, being dependent on the wider economy and heavily affected by technological advances and environmental concerns. The highly skilled Automobile Technician keeps abreast of continuous changes in the sector, whether these are to do with performance, safety, or green energy sources. He/she will deeply understand vehicles' electrical and electronic systems and their integration; have physical stamina, coordination, and kinaesthetic skills, and be versatile. He/she will be assigned the more complex diagnostic tasks, the most advanced vehicles, and those incorporating the latest technologies. This person may rapidly progress to more senior roles as trainer, supervisor, planner and/or manager.

1.2 The content, relevance and significance of this document

This document incorporates a Role Description and Occupational Standards which follow the principles and some or all of the content of the WorldSkills Occupational Standards. In doing so WSE acknowledges WorldSkills International's (WSI's) copyright. WSE also acknowledges WSI's intellectual property rights regarding the assessment principles, methods and procedures that govern the competition.

Every Expert and Competitor must know and understand this Technical Description.

In the event of any conflict within the different languages of the Technical Descriptions, the English version takes precedence.

1.3 Associated documents

Since this Technical Description contains only skill-specific information it must be used in association with the following:

- WSE – Competition Rules

- WSI – WorldSkills Occupational Standard framework
- WSE – WorldSkills Europe Assessment Strategy
- WSE – Online resources as referenced in this document
- WSE – Code of Ethics and Conduct
- Host Country – Health and Safety regulations

2 The Occupational Standards

2.1 General notes regarding WSOS / WSEOS

Where appropriate WSE has utilised some, or all, of the WorldSkills International Occupational Standards (WSOS) for those Skills Competitions that naturally align between the two international competitions. Where the Skill is exclusive to the EuroSkills Competition, WorldSkills Europe has developed its own Occupational Standards (WSEOS) using the same principles and framework to that used for the development of the WSOS. For the purposes of this document the use of the words “Occupational Standards” will refer to both WSOS and WSEOS.

The Occupational Standards 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. Helpfully, for the global consultation on the WSOS in 2014-2021, around 50 percent of responses came from European industry and business.

Each Skill Competition is intended to reflect international best practice as described by the Occupational Standards, and to the extent that it is able to. The Occupational Standards 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 not be separate tests of knowledge and understanding.

The Occupational Standards are 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 Occupational Standards. The sum of all the percentage marks is 100.

The Marking Scheme and Test Project will assess only those Skills that are set out in the Occupational Standards. They will reflect the Occupational Standards as comprehensively as possible within the constraints of the Skill Competition.

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

2.2 Occupational Standards

Section		Relative importance (%)
1	Work organization and self-management	10
	<p>The individual needs to know and understand:</p> <ul style="list-style-type: none"> • the purposes, uses, care, maintenance of all equipment, material and chemicals together with their risk and safety implications • the difficulties and risks associated with related activities, together with their causes and methods of prevention. • the time management and parameters and associated with each activity 	

Section		Relative importance (%)
	<ul style="list-style-type: none"> environmental, health and work safety principles and their application in the work environment 	
	<p>The individual shall be able to:</p> <ul style="list-style-type: none"> prepare and maintain a safe, tidy and efficient work station prepare self for the tasks in hand, including full regard for health and safety 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 and safety standards applying to the environment, equipment and materials restore the work area and vehicle to an appropriate state and condition 	
2	Communication and interpersonal skills	15
	<p>The individual needs to know and understand:</p> <ul style="list-style-type: none"> 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 fault reporting in oral, written and electronic formats the required standards for customer service and care 	
	<p>The individual shall be able to:</p> <ul style="list-style-type: none"> 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 have Initiative to find the best solutions to solve problematic situations 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
	<p>The individual needs to know and understand:</p> <ul style="list-style-type: none"> spark ignition and compression ignition engine management systems engine mechanical systems 	

Section		Relative importance (%)
	<ul style="list-style-type: none"> • hybrid/electrical 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 	
	<p>The individual shall be able to:</p> <ul style="list-style-type: none"> • use test equipment to measure, check and diagnose management systems for mechanical and/or electronic faults • perform tests to identify and isolate a fault 	
4	Inspection and diagnosis	35
	<p>The individual needs to know and understand:</p> <ul style="list-style-type: none"> • 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 • Technological innovations 	
	<p>The individual shall be able to:</p> <ul style="list-style-type: none"> • calibrate test 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 ◦ electronic management systems ◦ Infotainment systems ◦ mechanical components and systems ◦ fuel injection and hybrid systems 	

Section		Relative importance (%)
	<ul style="list-style-type: none"> ◦ comfort systems ◦ charging and starting system • calculate, check and interpret results as required • review the options for repair or replacement 	
5	Repair, overhaul and service	15
	<p>The individual needs to know and understand:</p> <ul style="list-style-type: none"> • the options for repair or replacement • repair methods / procedures, special tool requirements • procedures and methods applied to maintenance • procedures and methods applied to overhaul • effects on other vehicle systems and associated repair work 	
	<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 brake • 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 hybrid/electrical vehicle systems • Repair diesel fuel systems including electronic compression ignition engine management systems and associated components 	
	Total	100

3 The assessment approach & principles

3.1 General guidance

Note: this Section and Section 4 summarize a great deal of new information and guidance regarding assessment. Please refer to the Competition Rules for greater detail.

The Competition Committee (CC) establishes the principles and techniques to which assessment at the EuroSkills Competition must conform.

Expert assessment practice lies at the heart of the EuroSkills Competition. For this reason it is the subject of continuing professional development and scrutiny. The growth of expertise in assessment will inform the future use and direction of the main assessment instruments used by the EuroSkills Competition: the Marking Scheme, Test Project, and Competition Information System (CIS).

Assessment at the EuroSkills Competition falls into two broad types: measurement and judgement. All assessments will be governed by explicit benchmarks, referenced to best practice in industry and business.

The Marking Scheme must include these benchmarks and follow the weightings within the Occupational Standards. The Test Project is the assessment vehicle for the Skill Competition, and also follows the Occupational Standards. The CIS enables the timely and accurate recording of marks, and has expanding supportive capacity.

The Marking Scheme, in outline, will lead the process of Test Project design. After this, the Marking Scheme and Test Project will be designed and developed through an iterative process, to ensure that both together optimize their relationship with the Technical Description and the principles for assessment as set out in the WSE Assessment Strategy. They will be agreed by the Experts and submitted to WSE for approval together, in order to demonstrate their quality and conformity with the Occupational Standards.

Prior to submission for approval to WSE, the Marking Scheme and Test Project will be reviewed by the WSE Skill Advisors in order to benefit from the capabilities of the CIS.

4 The Marking Scheme

4.1 General guidance

This section describes the role and place of the Marking Scheme, how the Experts will assess Competitors' work as demonstrated through the Test Project, and the procedures and requirements for marking.

The Marking Scheme is the pivotal instrument of the WorldSkills Competition, in that it ties assessment to the standard that represents each skill competition, which itself represents a global occupation. It is designed to allocate marks for each assessed aspect of performance in accordance with the weightings in the Standards.

By reflecting the weightings in the Standards, the Marking Scheme establishes the parameters for the design of the Test Project. Depending on the nature of the skill competition and its assessment needs, it may initially be appropriate to develop the Marking Scheme in more detail as a guide for Test Project design. Alternatively, initial Test Project design can be based on the outline Marking Scheme. From this point onwards the Marking Scheme and Test Project should be developed together.

Section 2.1 above indicates the extent to which the Marking Scheme and Test Project may diverge from the weightings given in the Standards, if there is no practicable alternative.

For integrity and fairness, the Marking Scheme and Test Project are increasingly designed and developed by one or more Independent Test Project Designer(s) with relevant expertise. In these instances, the Marking Scheme and Test Project are unseen by Experts until immediately before the start of the skill competition, or competition module. Where the detailed and final Marking Scheme and Test Project are designed by Experts, they must be approved by the whole Expert group prior to submission for independent validation and quality assurance. Please see the Competition Rules for further details.

Experts and Independent Test Project Designers are required to submit their Marking Schemes and Test Projects for review, verification, and validation well in advance of completion. They are also expected to work with their Skill Advisor, reviewers, and verifiers, throughout the design and development process, for quality assurance and in order to take full advantage of the CIS's features.

In all cases a draft Marking Scheme must be entered into the CIS at least eight weeks prior to the Competition. Skill Advisors actively facilitate this process.

4.2 Assessment criteria

The main headings of the Marking Scheme are the Assessment Criteria. These headings are derived before, or in conjunction with, the Test Project. In some skill competitions the Assessment Criteria may be similar to the section headings in the Standards; in others they may be different. There will normally be between five and nine Assessment Criteria. Whether or not the headings match, the Marking Scheme as a whole must reflect the weightings in the Standards.

Assessment Criteria are created by the person or people developing the Marking Scheme, who are free to define the Criteria that they consider most suited to the assessment and marking of the Test Project. Each Assessment Criterion is defined by a letter (A-I). **The Assessment Criteria, the allocation of marks, and the assessment methods, should not be set out within this Technical Description. This is because the Criteria, allocation of marks, and assessment**

methods all depend on the nature of the Marking Scheme and Test Project, which is decided after this Technical Description is published.

The Mark Summary Form generated by the CIS will comprise a list of the Assessment Criteria and Sub Criteria.

The marks allocated to each Criterion will be calculated by the CIS. These will be the cumulative sum of marks given to each Aspect within that Assessment Criterion.

4.3 Sub criteria

Each Assessment Criterion is divided into one or more Sub Criteria. Each Sub Criterion becomes the heading for a WorldSkills marking form. Each marking form (Sub Criterion) contains Aspects to be assessed and marked by Measurement or Judgement, or both Measurement and Judgement.

Each marking form (Sub Criterion) specifies both the day on which it will be marked, and the identity of the marking team.

4.4 Aspects

Each Aspect defines, in detail, a single item to be assessed and marked, together with the marks, and detailed descriptors or instructions as a guide to marking. Each Aspect is assessed either by Measurement or by Judgement.

The marking form lists, in detail, every Aspect to be marked together with the mark allocated to it. The sum of the marks allocated to each Aspect must fall within the range of marks specified for that section of the Standards. This will be displayed in the Mark Allocation Table of the CIS, in the following format, when the Marking Scheme is reviewed from C-8 weeks. (Section 4.1 refers.)

	CRITERIA								TOTAL MARKS PER SECTION	WSSS MARKS PER SECTION	VARIANCE	
	A	B	C	D	E	F	G	H				
STANDARDS SPECIFICATION SECTION	1	5.00								5.00	5.00	0.00
	2		2.00					7.50		9.50	10.00	0.50
	3								11.00	11.00	10.00	1.00
	4			5.00						5.00	5.00	0.00
	5				10.00	10.00	10.00			30.00	30.00	0.00
	6		8.00	5.00				2.50	9.00	24.50	25.00	0.50
	7			10.00				5.00		15.00	15.00	0.00
TOTAL MARKS	5.00	10.00	20.00	10.00	10.00	10.00	15.00	20.00	100.00	100.00	2.00	

4.5 Assessment and marking

There is to be one marking team for each Sub Criterion, whether it is assessed and marked by Judgement, Measurement, or both. The same marking team must assess and mark all Competitors. Where this is impracticable (for example where an action must be done by every Competitor simultaneously, and must be observed doing so), a second tier of assessment and marking will be put in place, with the approval of the Competitions Committee Management Team. The marking teams must be organized to ensure that there is no compatriot marking in any circumstances. (Section 4.6 refers.)

4.6 Assessment and marking using judgement

Judgement uses a scale of 0-3. To apply the scale with rigour and consistency, Judgement must be conducted using:

- benchmarks (criteria) for detailed guidance for each Aspect (in words, images, artefacts, or separate guidance notes). This is documented in the Standards and Assessment Guide.
- the 0-3 scale to indicate:
 - 0: performance below industry standard
 - 1: performance meets industry standard
 - 2: performance meets and, in specific respects, exceeds industry standard
 - 3: performance wholly exceeds industry standard and is judged as excellent

Three Experts will judge each Aspect, normally simultaneously, and record their scores. A fourth Expert coordinates and supervises the scoring, and checks their validity. They also act as a judge when required to prevent compatriot marking.

4.7 Assessment and marking using measurement

Normally three Experts will be used to assess each Aspect, with a fourth Expert supervising. In some circumstances the team may organize itself as two pairs, for dual marking. Unless otherwise stated, only the maximum mark or zero will be awarded. Where they are used, the benchmarks for awarding partial marks will be clearly defined within the Aspect. To avoid errors in calculation or transmission, the CIS provides a large number of automated calculation options, the use of which is mandated.

4.8 Assessment overview

Decisions regarding the choice of criteria and assessment methods will be made during the design of the competition through the Marking Scheme and Test Project.

4.9 Skill Assessment Strategy

Work Health, Safety (including housekeeping) and Sustainable practice

Engine Mechanical

- Testing and diagnosis
- Repair and measurement

Steering/Suspension/Brakes and Stability Control Systems

- Testing and diagnosis
- Repair and measurement

Petrol or Diesel Engine Management Systems

- Testing and diagnosis
- Repair and measurement

Electrical Systems

- Testing and diagnosis
- Repair and measurement

Other procedures

- Competitors shall not be awarded points for an item within a task they are unable to complete because of tool shortage in their own tool kit.*if applicable
- If some or all Competitors are unable to complete one or more elements of a task due to shortfalls of the workstation itself, the points of these elements of the task shall be awarded to all Competitors so as not to distort the scoring scheme.
- When an equipment failure occurs preventing a Competitor from completing one or more elements of a task, then all points for all elements affected will be awarded to all Competitors.
- Experts are to complete a marking form for each assessment area for each individual Competitor.
- Marks will vary according to the marking scale defined for the Competition, but will align to the ranges defined by the standards specification.
- Expert marking teams are devised to include a mixture of WSE experience, language and culture.
- To the extent reasonably possible each Expert will assess a similar number of aspects for each Competitor.

4.10 Skill Assessment Procedures - Mark distribution

This section defines the assessment criteria and the number of marks (judgement and measurement) awarded. The total number of marks for all assessment criteria must be 100. The table below is advisory only for the development of the Test Project and Marking Scheme.

Section	Criterion	Marks		
		Judgement	Measurement	Total
A	Engine Mechanical	0	25	25
B	Steering/Suspension/Brakes and Stability Control Systems	0	25	25
C	Petrol/Diesel and hybrid/electrical vehicle Management Systems	0	25	25
D	Electrical Systems	0	25	25
Total =		0	100	100

A basic sample outline of the assessing specification is shown here:

Module 1: Engine Mechanical			
Work processes: Preparation - Safe and tidy working			
Performance indicators	Marking system		Remarks
Competitors are assessed on their preparation for the task prior to starting work on the engine. Will be judged on safety working and tidying up once the task is completed	Maximum score	3,0 points	
Work processes: Dismantling Engine			
Performance indicators	Marking system		Remarks
Competitors are assessed on disassembling the engine block with use of right equipment and tools.	Maximum score	5 points	
Work processes: Inspection and Measurement of Engine			
Performance indicators	Marking system		Remarks
Competitors are assessed on the inspection of the engine, the correct use of measurement tools, the accuracy of their measurements and making a correct conclusion from the measurements	Maximum score	9,6 points	
Work processes: Re-assembling Engine			
Performance indicators	Marking system		Remarks
Competitors are assessed on re-assembling the engine block with use of correct equipment and tools.	Maximum score	7,4 points	
	Total	25 points	

5 The Test Project

5.1 General notes

Sections 3 and 4 govern the development of the Test Project. These notes are supplementary.

Whether it is a single entity, or a series of stand-alone or connected modules, the Test Project will enable the assessment of the skills in each section of the Occupational Standards.

The purpose of the Test Project is to provide full and balanced opportunities for assessment and marking across the Occupational Standards, in conjunction with the Marking Scheme. The relationship between the Test Project, Marking Scheme and Occupational Standards will be a key indicator of quality.

The Test Project will not cover areas outside the Occupational Standards, or affect the balance of marks within the Occupational Standards other than in the circumstances indicated by Section 2.1.

The Test Project will enable knowledge and understanding to be assessed solely through their applications within practical work.

The Test Project will not assess knowledge of the EuroSkills Competition's rules and regulations.

This Technical Description will note any issues that affect the Test Project's capacity to support the full range of assessment relative to the Standard Specification. Section 2.1 refers.

5.2 Format/ structure of the Test Project

- Test Project with separately assessed modules

Note: The format of the assessment is a series of assessments to be completed in rotation. All competitors will do all assessments selected at the competition.

5.3 Test Project design requirements

The Competition is presently based: ~~on a maximum of 24 Competitors.~~

- The format of the test project is a series of four modules to be completed in rotation.
- All Competitors must compete in all modules.
- The total working time for the modules will be at least 14 hours.
- The Competitor has to carry out, independently, all modules.

All modules have to include:

- Description of the test.
- Competitor Instructions for completing the test.
- Competitor Report sheets (if necessary).
- Instructions to the Workshop Supervisor.
- Marking scheme for the test

The competitors will be assessed on all modules:

- Module 1: Engine Mechanical
- Module 2: Steering/Suspension/Brakes and Stability Control Systems
- Module 3: Petrol/Diesel and hybrid/electrical vehicle Management Systems

- Module 4: Electrical Systems

Specifications of each module:

Module 1: Engine Mechanical:

- Engine on stand.
- Engine dismantling, measuring, reassembling, etc.

Module 2: Steering/Suspension/Brakes and Stability Control Systems:

- Vehicle
- Steering and suspension mechanical and electrical/electronic repairs
- Steering angle measurements and adjustments, etc.
- Braking system mechanical inspection and repairs
- Braking system electrical/electronic inspection/diagnostics and repairs
- Stability control electrical/electronic inspection/diagnostics and repairs

Module 3: Petrol or Diesel Engine Management Systems:

- Vehicle or engine with management system on stand
- Engine management diagnostics and testing.
- Engine management electrical/electronic repairs

Module 4: Electrical Systems:

- Vehicle or electrical systems on stand
- Body electrical circuits
- Starter motor
- Alternator
- High voltage system on stand, Limited in low tension maximum 48 volts DC

The assessments are representative of the daily activities in this trade. The detailed timing schedule is established in such a way that the competition area is constantly demonstrating activities for the complete competition period. For each assessment, the competitors will receive their work assignments and instructions from the Expert. It comes with a written work sheet and the competitor has to fulfill the tasks within the required time frame.

The competitors can familiarize themselves with the modules the day prior to the starting day of the competition.

Assessments for Light Vehicle Technician Competition

This description has two main functions.

- It will be the basis on which Experts will select assessments for their submission to the Host country.
- It will act as a guideline to countries that do not have an Expert for Competitor preparation. The number and specification of the list must not be taken as complete or final as it is intended that regular amendments and additions will follow:
 - In the light of its use over a period of time
 - In the interest of arriving at a more complete list
 - In regard to technological change and subsequent updating with respect to the regulations of the host country

The assessments may involve the diagnosis, service and repair of the following:

Module	may include	excluding
Engine Mechanical	All engine measurements Removal and fitting of all engine mechanical components	Boring and honing cylinder Piston to connecting rod fitting by heating
Steering/Suspension/ Brakes and Stability Control Systems	Removal and fitting of all steering and suspension components. Hydraulic systems PAS Air suspension (low pressure) Tyre pressure monitoring systems 4 Wheel Alignments 4 Wheel Steering systems Electronic Suspension systems Electric / Computer-controlled power assisted steering Removal and fitting of all brake components ABS Systems 4 Wheel Disc systems Disc/Drum systems Parking Brake systems Brake assistance and electronic stability control	Shock absorber testing Air brake systems
Engine Management Systems The competition organizer will decide on availability to choose compression or spark ignition engines.	Spark ignition Pressure and flow testing Use of diagnostic tools Exhaust Gas Recirculation Catalytic Converters Ignition systems Engine Actuators and Sensors Electronic Fuel Injection Engine Analysers Exhaust Gas Analysers	Fuel tanks Injector servicing Connecting/ disconnecting fuel pipes. Any work that requires the fuel systems to be opened to the atmosphere. Work involving coolant

	Starting systems Multiplex systems	
	Compression Ignition Filtration systems Use of diagnostic tools Glow plug system Electronic pump control Systems Engine Actuators and Sensors Particulate filters Common rail systems Forced induction systems Starting systems Multiplex systems	Bench testing injector pumps In-line fuel pump
Electrical Systems	Charging systems Lighting systems Accessory circuits Dashboard gauges and warning devices Design, construct and test electrical / electronic circuit boards Multiplex systems Climate control systems Infotainment systems Smart Power charging system High voltage system, exclusively on didactic module designed for learning. Without risk of electrification.	Air bag and S.R.S. systems Alarm and immobiliser systems Work involving refrigerant Work involving coolant High voltage system on vehicle.

5.4 Test Project development

The Test Project MUST be submitted using the templates provided by WSE. Use the Word template for text documents and DWG template for drawings. Please contact jordy.degroot@worldskillseurope.org for guidance.

If the Test Project is designed by an Independent Test Project designer, then the Test Project must be designed in accordance with the WSE Independent Test Project Guide v1.1.

If your Skill wishes to have an Independent Test Project designer, you must ensure that WorldSkills Europe is made aware of this, so that it can be assured that there is proper

funding in place, or that the Independent Test Project designer is aware that he/she will do this task free of charge.

5.4.1 Who develops the Test Projects or modules

The Test Project / modules are developed under the supervision of:

- All Experts (Plan A)
- Independent Test Project designer/ Third party (Plan B)

Note: If the TP is developed by an external provider, it is necessary to work in good collaboration with the CE and the DCE throughout the development.

5.4.2 How and where is the Test Projects or modules developed

The Test Project or modules are developed in the following manner:

- Other:

The assessments are developed by all experts or external provider as follows:

- Assessments will be designed using the guidelines set out in 5.3
- Four (4) modules of total 14 hours, assessments will be designed using the guidelines set out in 3.1
- The modules proposals or actual modules will be prepared on the Competition site by a team of Experts according to the equipment provided by the Host country. The Host country is required to provide a sufficient choice of materials and spare parts in order to enable the Experts to set up a variety of projects.

5.4.3 When is the Test Project developed

The Test Project is developed according to the following timeline:

TIME	ACTIVITY
At the previous Competition	not applicable
XX months prior to the Competition	not applicable
At the Competition	<p>Plan A: The modules are chosen/developed at the Competition site in the day/days preceding the competition by experts</p> <p>Plan B: organized by an Independent Test Project designer in collaboration with the CE and DCE</p>

5.5 Test Project validation

Validation will be demonstrated by the Expert groups designing/choosing the modules so each can be completed with the equipment, knowledge and time constraints.

- The Chief Expert will ensure that the individual modules are endorsed by the Expert group which has designed/chosen the modules.

5.6 Test Project selection

- Other:

Note: Refer to 5.4.2 (How and where is the modules task are developed).

5.7 Test Project circulation

Please note that if a Test Project is known by the Chief- and/or Deputy Chief Experts, and/or any of the other Experts, it must be shared via the forums before the start of the Competition. This also means that this Test Project is subject to a 30% change before the start of the Competition.

The Test Project is circulated via the website as follows:

The Test Project will not be circulated.

5.8 Test Project coordination (preparation for competition)

Coordination of the Test Project will be undertaken by:

- Chief Expert and Deputy Chief Expert

5.9 Test Project change at the competition

Not applicable.

5.10 Material or manufacturer specifications

Specific material and/or manufacturer specifications required to allow the Competitors to complete the Test Project will be supplied by the Host Organization and are available via the forums.

However, note that in some cases details of specific materials and/or manufacturer specifications may remain secret and will not be released prior to the Competition. These items may include those for fault finding modules or modules not circulated.

Not applicable.

5.11 Software specifications

Software must accept online manufacturer manuals.

Internet access must be of good quality.

6 Skill management and communication

6.1 Discussion forum

Prior to the EuroSkills Competition, all discussion, communication, collaboration, and decision making regarding the Skill Competition must take place on the skill specific Discussion Forum, which can be reached via www.worldskillseurope.org. Skill related decisions and communication are only valid if they take place on the forum. The Chief Expert (or an Expert nominated by the Chief Expert) will be the moderator for this Forum. Refer to Competition Rules for the timeline of communication and competition development requirements.

6.2 Competitor information

All information for registered Competitors is available from the WorldSkills Europe website www.worldskillseurope.org. Please contact jordy.degroot@worldskillseurope.org for guidance.

The information includes:

- Competition Rules
- Technical Descriptions
- Test Projects
- Infrastructure List
- EuroSkills Health, Safety, and Environment Policy and Regulations
- Other Competition-related information

6.3 Test Projects and Marking Schemes

Circulated Test Projects will be available at the WorldSkills Europe website from www.worldskillseurope.org. Please contact jordy.degroot@worldskillseurope.org for guidance.

6.4 Day-To-Day management

The day-to-day management of the Skill Competition during the EuroSkills Competition is defined in the Skill Management Plan that is created by the Skill Management Team led by the Chief Expert. The Skill Management Team comprises the Jury President, Chief Expert and Deputy Chief Expert. The Skill Management Plan is progressively developed in the six months prior to the Competition and finalized at the Competition by agreement of the Experts. The Skill Management Plan can be viewed at www.worldskillseurope.org. Please contact jordy.degroot@worldskillseurope.org for guidance.

7 Skill specific safety requirements

7.1 Requirements

Refer to Host Country/Region Health and Safety documentation for Host Country/Region regulations. This document will be shared via the forums. One overall Health and Safety document will be published, as well as Skill specific safety requirements.

8 Materials and equipment

8.1 Infrastructure List

The Infrastructure List details all equipment, materials and facilities provided by the Competition Organizer.

The Infrastructure Lists will be available at the WorldSkills Europe website from www.worldskillseurope.org. Please contact jordy.degroot@worldskillseurope.org for guidance.

The Infrastructure List specifies the items and quantities requested by the Experts for the next Competition. The Host Organization will progressively update the Infrastructure List specifying the actual quantity, type, brand, and model of the items.

At each Competition, the Experts must advise the Competition Manager of any increases in space and/or equipment.

At each Competition, the Technical Observer must audit the Infrastructure List that was used at that Competition.

The Infrastructure List does not include items that Competitors and/or Experts are required to bring and items that Competitors are not allowed to bring – they are specified below.

8.2 Competitor tools

WorldSkills Europe aims to minimize the sending of toolboxes as much as possible. We therefore ask you to keep this in mind when writing the section below. Please be advised that competitors should bring as little as possible and what they do bring **MUST** be true hand tools. Only items are allowed that would significantly affect their ability to perform the task and deliver the Test Project to a high standard.

Personal toolboxes are not applicable for this Skill.

Only head lights, personal torch lights are allowed.

The host country provide:

Competitor's minimum tool requirements include in the infrastructure list (IL):

- 1 set of flat bladed screwdrivers
- 1 set of pozi-drive screwdrivers (4 pieces min.)
- 1 set of Allen (hex, inbus) key 1.5 to 10 mm
- 1 set of torx drivers internal ranging from size 8 to 55
- 1 set of torx drivers external ranging from 8 to 55
- 1 open ended spanners 6 to 32 mm
- 1 set of ring spanners 6 to 32 mm
- 1 set of torx ring spanners 8 – 55
- 1 water pump (pipe) pliers
- 1 side cutter
- 1 long nosed pliers
- 1 combination pliers
- 1 vice grip
- 1 metal ruler (300 mm)
- 1 torch lamp (flashlight)
- 1 vernier caliper gauge, internal, external and depth gauge (accuracy 0.02 mm)
- 1 micrometer (palmer) 0 – 25 mm (0 - 1 inch)

- 1 digital multimeter, V, A (10 A), Ohms
- 1 feeler gauge set (0.05 mm / 0.002 inch increments up to 2.00 mm / 0.080 inch)
- 1 test lamp 12 V
- 1 test lamp (LED type)
- Socket set/s ranging from 6 to 32 mm
- Torque wrench(s) ranging from 0 to 200 Nm
- 1 torque angle adapter
- 1 hammer 300g
- 1 soft headed hammer (mallet)
- 1 parallel drift punch set (diameter 2 to 8 mm)
- 1 magnetic pick up tool
- 1 set metric deep/long wall sockets

8.3 Materials, equipment and tools supplied by Competitors in their toolbox

Not applicable.

8.4 Materials, equipment and tools supplied by the Experts

Not applicable.

8.5 Materials, equipment and tools prohibited in the Skill area

Electric, battery or pneumatic powered tools.

8.6 Workshop Layout

Workshop layouts from previous competitions are available by contacting the Competition and IT Coordinator at: jordy.degroot@worldskillseurope.org. New Workshop Layouts will be communicated via the forums when completed.

Please be advised that you will have the opportunity to discuss your Workshop Layout proposal with the Host Organization during the Skills Development Workshop (SDW) and the Competition Preparation Meetings (CPM).

For workshop layout development, please refer to the forums.

9 Skill-specific rules

9.1 Introduction

Skill-specific rules cannot contradict or take priority over the Competition Rules. They do provide specific details and clarity in areas that may vary from Skill Competition to Skill Competition. This includes but is not limited to personal IT equipment, data storage devices, Internet access, procedures and workflow, and documentation management and distribution. Breaches of these rules will be solved according to the Issue and Dispute Resolution procedure including the Code of Ethics and Conduct Penalty System.

9.2 Personal laptops – USB – memory sticks – mobile phones

Competitors:

Personal laptops are not accepted on the competition site

Personal USB memory sticks are not accepted on the competition site

Cell phones are not accepted for competitors, they will be locked up in a specific locker from the beginning to the end of the day, all days.

Experts:

Experts are asked to use their cell phones only when absolutely necessary during the competition.

9.3 Personal photo cameras – video taking devices

Competitors & Experts

No photos and videos are accepted before the end of the competition at C3.

9.4 Communication between compatriot experts and competitors

Communication between experts and competitors is only allowed for 15 minutes before the start of the competition from C1 to C3.

9.5 Other

10 Visitor and media engagement

10.1 Engagement

Following is a list of possible ways to maximize visitor and media engagement, within the remit of the Competition Rules:

- Try a trade
- Display screens
- Assessments descriptions
- Enhanced understanding of Competitor activity
- Competitor profiles
- Career opportunities
- Daily reporting of competition status
- Time based parts of the Test Project

11 Sustainability

11.1 Sustainability

This Skill Competition will focus on the sustainable practices below:

- Recycling
- Use of 'green' materials
- Use of completed Assessments after Competition