CARBOREP
CAR BODY REPAIR

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European Recommendations Document

CARBOREP

European Harmonised Training for Personnel working with Car Body Repair Technology

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2 Executive summary

The purpose of the CARBOREP European Recommendations Document is to support the implementation of the European Car Body Repair Technician professional profile training course in other European Vocational Education and Training Systems (VET). The European Recommendations Document intends to create the conditions to successfully and quickly promote, and valorise, the project results in the remaining European countries, all also affected by the identified needs.

3 Glossary of terms

Acronym	Meaning
NB	Nota Bene – note well
ECBRT	European Car Body Repair Technician
EQF	European Qualifications Framework
ECVET	European Credit System for Vocational Education and Training
RPL	Recognition of Prior Learning
VET	Vocational Education and Training
CU	Competence Unit

4 Introduction

The automotive industry is crucial for Europe's prosperity. The sector provides jobs for 13.8 million people and accounts for over 7% of the EU's GDP. The EU is among the world's biggest producers of motor vehicles and the sector represents the largest private investor in research and development (R&D). To strengthen the competitiveness of the EU automotive industry and preserve its global technological leadership, the European Commission supports global technological harmonisation and provides funding for R&D.[1]

The European auto body repair industry is as an important economic branch of Europe, with over 200,000 working professionals and 50,000 companies (mainly SMEs) as well as ever-continuing innovations in vehicle technology.

The car body repair sector is in constant need of curricula for new skills and expertise. In the past decade, one of the major changes for repairers has been the replacement of the joining techniques of welding by adhesive bonding of car body parts. The use of adhesive bonding demands new skills and training for car body repair personnel.

There is a lack of specific qualifications and training schemes for personnel working in the car body repair and maintenance industry. There is a need for a high-quality curriculum featuring the state of the art technologies and joining processes used in car body repair, to guarantee motor vehicle safety. As manufacturing techniques advance and improve, it is imperative that car body repair and maintenance routines are performed correctly, so local repair shops and other independent operators must advance too.

The CARBOREP Industrial Needs Analysis report, which was a survey of key car body repair stakeholders, to provide a better understanding of how the training and skills needs of the wider repair sector should be addressed. These stakeholders drive the practical, qualitative and economic shape of the repair sector, and an analysis of their responses would allow the CARBOREP project to focus on delivering a European Car Body Repair Technician (ECBRT) training profile properly tailored to its intended market.

The key outcomes of the survey were:

- Nearly all the centres of expertise and training were very positive towards the CARBOREP project and creation of the ECBRT training profile
- Repair garages indicated that they believe their own technicians may lack the skill to perform high quality repairs on modern vehicles.
- Repair garages varied in their opinions on the quality of training available to them
- Repair garages saw the benefit, in terms of skills and quality of work, of an ECBRT training profile.

[1] https://ec.europa.eu/growth/sectors/automotive_bg, as of August 2019.

5 Principles for European Recognition and implementation of Car Body Repair Technician Training

The principles for implementation and recognition of the European Car Body Repair Technician training courses at European level are based on EU policies and tools, which are key factors for enhancing transparency, comparability and portability of people's qualifications.

The Recommendation of the European Parliament and the Council of 23 April 2008 established the European Qualifications Framework (EQF) for lifelong learning, which is a common reference framework of eight levels of qualification, expressed as learning outcomes with increasing levels of proficiency. The EQF serves as a translation grid between different national qualifications systems and their levels.

The new Council Recommendation on the EQF for lifelong learning (2017) built on the achievements of the 2008 Recommendation, ensuring continuity in the processes launched by individual countries to reference their qualifications frameworks and levels to the EQF.

Learning Outcomes are 'statements regarding what a learner knows, understands and is able to do on completion of a learning process, which are defined in terms of knowledge, skills and responsibility and autonomy' (Council Recommendation EQF, 2017).

The ECVET Recommendation (2009) established the European Credit System for Vocational Education and Training (ECVET) at all levels of the EQF with reference to VET qualifications in order to facilitate transfer, recognition and accumulation of individuals' achievements in formal and, where appropriate, non-formal and informal learning contexts.

In the context of ECVET Recommendation:

- ECVET points were allocated first to the ECBRT qualification, and then to its units.
- Units of learning outcomes are assessed and validated with a number of associated ECVET points.
- The transfer of ECVET credit into other programmes of learning is achieved through a general framework of cooperation, networking and mutual trust between partners – the sending and receiving/hosting organisations - and defined in a Memorandum of Understanding (MoU).
- Comparative analyses between National and European qualification frameworks is required to understand qualifications and diplomas awarded in different countries. In this regard, the European Commission has developed a tool[2] that compares Qualification frameworks among different countries.

[2] https://ec.europa.eu/ploteus/en/compare

6 European Car Body Repair Technician Profile

European Car Body Repair Technician Qualification can be described in terms of knowledge (K), skills (S) and competences (C) (the latter defined through autonomy and responsibility), for a single level of efficiency:

- **EQF Level 4 -** The ECBRT has (K) fundamental factual and theoretical knowledge of the theory, principles and applicability of joining processes to car body repair. He/she has (S) fundamental range of cognitive and practical skills required to identify/choose proper solutions, when applying joining processes to car body repair, in basic and specific problems. He/she (C) is able to self-manage, within the scope of a work instruction, the application of joining processes to car body repair, in a predictable context, but subject to change. He/she is able to take responsibility without autonomy for decision making in basic work and supervise basic joining processes tasks of car body repair personnel.

Harmonised European Car Body Repair Technician Courses will be delivered at a national level by EWF's Authorised Training Bodies (ATBs) and agreed upon by all Authorised Nominated Bodies (ANBs) from welding and joining societies within the EWF Training and Qualification System, in terms of themes, keywords and times devoted to them. Training Guidelines for ECBRT (EWF-ECBRT-19) cover the minimum requirements for education, training, examination and qualification of personnel in the field of car body repair.

Training guidelines for European Car Body Repair Course specify the access conditions, as follows:

- Competence Unit 1:
  - Be at least 18 years old and possess a minimum one year of experience in arc welding applied to car body repair, OR
  - Be at least 18 years old and possess a minimum of two years of welding experience in arc welding processes, OR
  - Be at least 18 years old and possess a valid welder qualification certificate ISO 9606.
- Competence Unit 2:
  - Having completed Competence Unit 1,
  - Be at least 18 years old and possess a minimum one year of experience in car body repair, OR
  - Be at least 18 years old and possess a valid European Adhesive Bonder Diploma.

ECBRT access paths are presented below

- Standard Route: Requires successful completion of EWF approved courses, which are designed to meet all the requirements in this Guideline. This is the route (Path 1 in Diagram 1) recommended by EWF as offering the fastest, most comprehensive manner in which the syllabus may be covered.

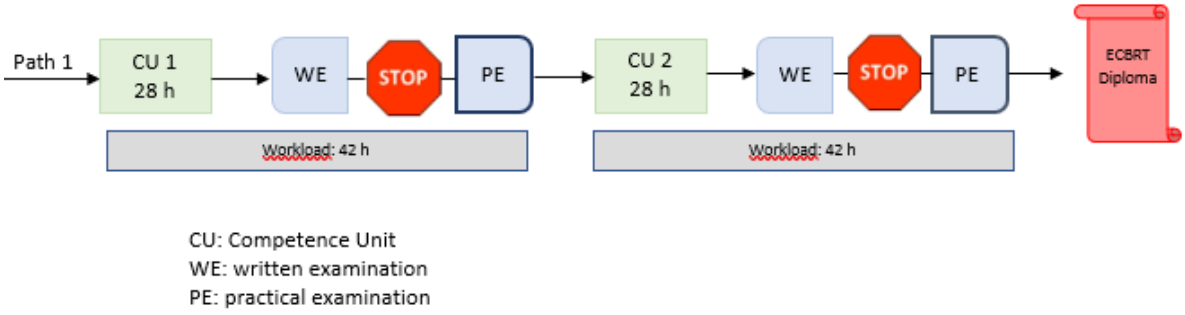

Diagram 1 – Standard route

- Alternative Route: Aimed at individuals who may already have experience of the job functions at a particular level without holding the appropriate qualification diploma. These individuals will have already gained full or partial knowledge of the syllabus defined in this guideline and can demonstrate their capability to proceed to examination either directly, without compulsory attendance of an ANB approved training course, or by attending only part of such a course by a process of Recognition of Prior Learning (RPL).

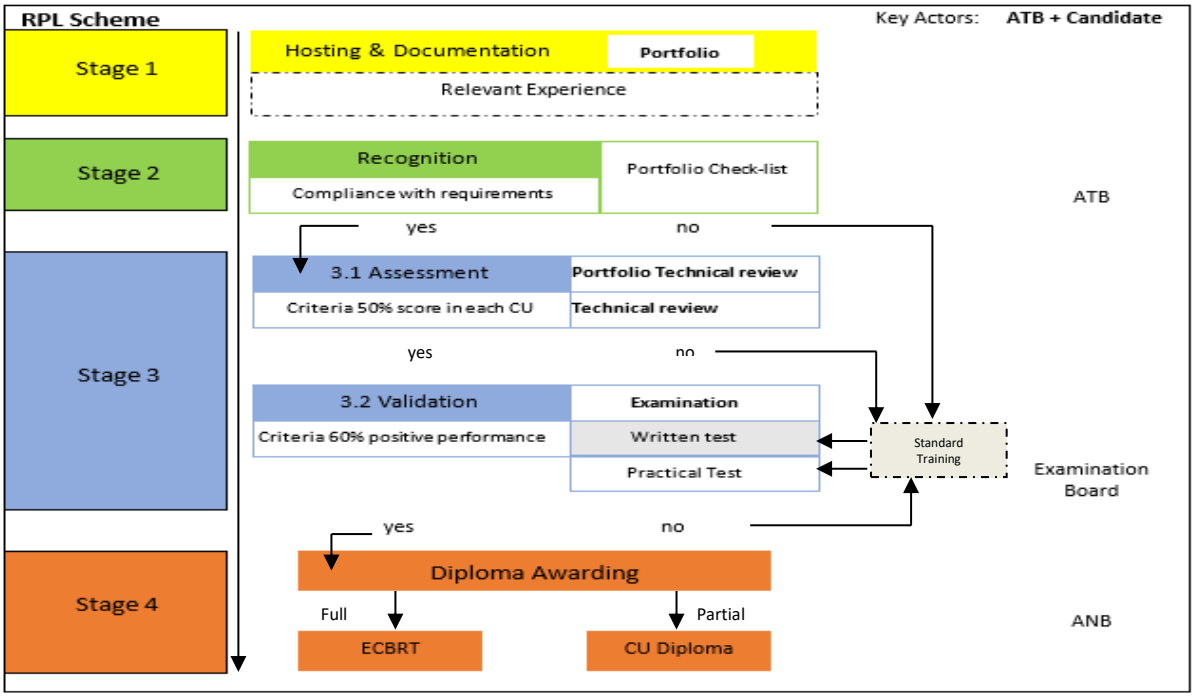

Diagram 2 – RPL Scheme

7 Conditions for the implementation of training courses

A set of conditions and steps were identified by the CARBOREP project partners to enhance the use of European car body repair qualifications at national level in countries not addressed in the project. For Vocational Education and Training (VET) Systems and companies to successfully implement the ECBRT qualification, the following actions are recommended:

- Promotion of the car body repair technician course and qualification at national level requires raising awareness, in companies, of the European car body repair technician course benefit. A strategic dissemination plan can be developed in this context, targeting initial and continuous VET, VET providers and companies. Several activities can be undertaken in each country, including face-to-face meetings, workshops, and the development of marketing materials.
- Comprehensive capacity of VET providers to deliver the European car body repair technician training course, which encompasses:
    - Adequate facilities and equipment to deliver theoretical and practical training, in accordance with the minimum requirements established in the EWF Guidelines;
    - Recruitment of trainees must follow minimum conditions, meaning on the one hand the right target groups should be approached, and on the other hand, applicants have to comply with the general access conditions for each profile, as described in section 6 (ECBRT access paths) of this recommendation;
    - Trainers in ECBRT courses should be experienced in the section of the curriculum they are teaching; simultaneously, they should be competent lecturers with comprehensive knowledge and skills regarding the ECBRT syllabus and pedagogical approaches and resources;
    - The number of trainers required to give the course shall be sufficient to ensure that the level of knowledge and industrial experience expressed in the syllabus is covered and represented by the team of trainers and visiting lecturers;
    - Train the trainers' courses regarding the ECBRT should include the development of knowledge and skills on:
        - ECBRT curricula;
        - Learning outcomes and their potential in relation to training and examination;
        - Learner-centred approaches and active training methodologies;
        - Materials for theoretical and practical training (e.g. software, toolbox with test pieces, videos, structuring aids, presentations, specimens, machines, among others).
- Compliance with EWF rules and guidelines, meaning the ANB will audit and verify if the ECBRT training course is delivered according to the ECBRT (EWF-ECBRT-19) guidelines, thus ensuring harmonised procedures and quality in training. Read Section 9 of this document for further details of the harmonised quality system.

8 The implementation of harmonised training.

The duration and aims for each Competence Unit (CU) is as follows:

- CU1: Has a duration of 42 hours, of which 21 hours are devoted to practical training, 7 hours to theoretical teaching, 7 hours to examination (both theoretical and practical) and 7 hours of self-study. The practical training will provide the students with the fundamental range of cognitive and practical skills in basic and specific problems related to Metal Active Gas (MAG) welding, Gas Metal Arc Weld (GMAW) Brazing and Spot Welding repair of a damaged automobile. The theoretical knowledge will provide students with the fundamental factual and theoretical knowledge in automotive steel grades and their application, MAG welding, Gas Metal Arc Weld Brazing and Resistance Spot Welding.

- CU2: Has a duration of 42 hours, of which 21 hours are devoted to practical training, 7 hours to theoretical teaching, 7 hours to examination (both theoretical and practical) and 7 hours of self-study. The practical training will provide the students with the fundamental range of cognitive and practical skills in basic and specific problems related to Adhesive Bonding, Mechanical Fastening and Hybrid Joining Technology in the repair of a damaged automobile. The theoretical knowledge will provide students with the fundamental factual and theoretical knowledge in materials used in automotive body construction and their application areas, Adhesive Bonding, the application of Mechanical fasteners; Hybrid joining technology (Adhesive Bonding in combination with Resistance Spot Welding or Mechanical fasteners)

The training methodologies applied to the ECBRT curriculum are learner-centred, meaning that the student has an active role in his/her learning process and is invited to explore real world challenges (problem-based learning). As such, the curriculum has a learning outcomes' approach, expressing what is expected from the students at the end of a learning cycle in terms of knowledge application, practical application and competences. The workload was also considered in the curriculum creation and refers to an estimation of the time students typically need to achieve the defined learning outcomes. The workload covers theoretical and practical training hours, self-study time, as well as the time devoted to examination.

In this context, the trainer becomes a facilitator who gives support to the students. The learning environment is extended to the shop-floor and laboratories and include a wide range of educational materials.

In the ECBRT, students are engaged in practical exercises, videos presentations, case study analysis and are asked to present solutions for problems. Technical skills continue to be essential, but the development of transversal skills is also being considered, such as individual

performance, ability to solve problems, creativity, innovation, critical thinking, communication skills and the collaboration with peers.

Within the EWF Harmonised International Qualification System, the examination follows the requirements of the ECBRT guidelines (EWF-ECBRT-19), and must be conducted by the ANB, authorised by EWF for this purpose.

Admission to the examinations leading to the award of the Diploma will be restricted to those who:

- Comply with the minimum requirements specified in the directory of access conditions,
- Standard Route: have attended at least 90% of the course (Exemptions are at the discretion of the ANB), approved by the ANB, according to this guideline, or
- Alternative Route and/or Transitional Agreements: Who have successfully passed the ANB detailed assessment;
- Successfully completed CU1 before undertaking CU2;
- The examination will take the form of a practical and theoretical examination. Applications must pass both theoretical and practical examinations.

To award the Qualification diploma, Competence Unit 2 must be completed within a maximum of 3 years after the award of the Certificate for Competence Unit 1: Steel Structural Body Construction – Welding Repair.

In order to pass the examinations, candidates must achieve 60% pass across all Job Functions within a Competence Unit.

Within the CARBOREP project, a database of 120 multiple-choice questions, with single answer solutions, has been developed to support the creation of written exams. The use of questions from the EWF database is mandatory in combination with national questions in each country. The questions are available in English and include 20 questions per job function and a final 20 for hybrid joining (of which 10 refer to spot welding and 10 to mechanical fastening).

Additional activities were suggested by the project partners to boost the results within EU countries, namely:

- Continuous improvement of the course contents and methodologies and its adaptation according to national context

- The involvement of stakeholders from both the education/training system and the industrial fields is of extreme importance to guarantee the successful implementation

of the ECBRT training and qualifications at national and European level. The role of each stakeholders should be:

- Trainers and experts in their specific areas – to prepare the ECBRT personnel to perform according to the industrial standards;
- Independent VET providers – to deliver the training courses based on the guidelines, thus giving access to the adequate educational materials for both practical and theoretical training, as well as the access to the proper facilities;
- ATBs - to deliver the training courses according to the guidelines, thus giving access to the adequate educational materials for both practical and theoretical training, as well as the access to the proper facilities;
- Awarding bodies/ANBs – to promote the ECBRT training courses/qualifications in each country; to guarantee that both training and examination comply with the EWF rules and industrial standards; to issue the ECBRT diploma;
- National qualification authorities – to promote and regulate the ECBRT training course/qualification whenever they are implemented in the national VET system;
- Companies (SMEs, medium and big) – to promote the demand of highly specialised personnel with responsibility for car body repair and related tasks; create awareness about the necessity of a nationally recognised training course and the need for qualified professionals as a key condition to assure the quality and security of the products.

9 The requirements for a harmonised quality system

Ensuring the quality of vocational education and examination, regardless of delivery organisation and location, requires a rigorous and transparent quality system, one that is widely accepted by the complete chain of stakeholders involved, from training institutions to awarding bodies, and including feedback from students, employers, and lecturers. EWF's quality assurance system, ensures that the required and expected standards of consistency and reliability of international qualifications are met uniformly in an impartial and non-discriminatory way.

The EWF quality system includes the ecosystem of members, other relevant stakeholders and the training centres (Diagram 3). The members are responsible for the identification of the most appropriate ANBs, which form the network of awarding organisations that implements and manages EWF's rules and operating procedures for ensuring that the standards of the qualifications are maintained.

Diagram 3 – The three pillars of EWF Quality Assurance

To ensure that EWF quality system rules are strictly followed by training centres, an Assessment and Surveillance activity has been implemented, one that ensures that, regardless of location and entity, ANBs are capable of and continue to deliver consistent results. This activity uses trained and approved assessors, who undertake scheduled auditing of the required compliance with EWF's quality system rules.

The training centres, in order to be approved as such, are required to comply with rules and procedures that are audited under EWF surveillance. The facilities, equipment, materials and staff of training centres are evaluated in order to ensure that they possess both the capabilities and the capacity to deliver the vocational education programmes to the expected level of quality and consistency. To obtain approval, training centres are also expected to have a close working relationship with industry and a clear understanding of its requirements for vocational education.

Feedback of experience and outcomes from candidates, employers, training centres and other stakeholders is brought into the EWF quality system by the ANBs to evaluate and challenge its processes, and review and amend its procedures.

The EWF quality system delivers a robust and reliable control of international VET qualifications.