Overview
This unit is about removing a variety of exterior and sub-structure body panels and panel sections where these are damaged and refitting with new or repaired replacements. The ability to weld vehicle panels is required.
Performance criteria

You must be able to:

P1 prior to working on the vehicle identify component materials involved in the construction of the vehicle in the areas that will be worked on during repair

P2 wear suitable personal protective equipment throughout all vehicle body panel removal and replacement activities.

P3 inspect, prepare and use all the Tools and equipment required, following manufacturers' instructions, prior to use.

P4 remove replace and/or refit all necessary vehicle body panels and assemblies following:
   P4.1 the manufacturer's methods/instructions
   P4.2 recognised researched repair methods
   P4.3 your workplace procedures
   P4.4 health, safety and legal requirements.

P5 seek guidance from the relevant person(s) promptly where there is the potential for your work to disturb other vehicle systems

P6 use replacement body panels and assemblies which conform to the vehicle specifications for dimensions, materials and functional capability.

P7 use and apply sealants and weld primers and anti-corrosion treatments conforming to the material or vehicle manufacturer's specification.

P8 ensure all test weld pieces conform to the current British Standard for appearance and penetration.

P9 ensure permanently fixed panels are replaced without incurring damage to the vehicle systems

P10 ensure all refitted body panels are aligned correctly with adjacent panels and fittings to manufacturers tolerances (panel gaps).

P11 complete all removal and replacement activities within the agreed timescale.

P12 report any anticipated delays in completion to the relevant person(s) promptly.
Knowledge and understanding

You need to know and understand:

**Legislative and organisational requirements and procedures**
- K1 the health and safety legislation and workplace procedures relevant to workshop practices, personal and vehicle protection when removing and replacing **vehicle body panels**
- K2 the requirements of manufacturer’s warranty agreements
- K3 the vehicle work specification agreed
- K4 your workplace procedures for
  - K4.1 the referral of problems
  - K4.2 reporting of delays to the completion of work
  - K4.3 personal protection
- K5 the requirements for protecting the vehicle and contents from damage before, during and after removing and replacing **vehicle body panels**
- K6 the importance of working to agreed timescales and keeping others informed of progress
- K7 the relationship between time, cost and profitability
- K8 the importance of reporting anticipated delays to the relevant person(s) promptly

**Tools and equipment**
- K9 how to prepare, test and use the tools and equipment required for the removal and replacement of **vehicle body panels** and ancillary fittings
- K10 how to operate resistance spot welding and MIG/MAG welding equipment to achieve welds to the current British Standard

**Materials**
- K11 the properties of component materials involved in the construction of the vehicle in the areas that will be worked on during repair
- K12 the properties of sealants, adhesives and anti-corrosion materials and the requirements for their safe use
- K13 the type of sealants and anti-corrosion materials to use and the manufacturer’s recommended methods for their application and thickness
- K14 how to use adhesive bonding materials
- K15 how to select and apply sealants and anti-corrosion materials

**Removing and replacing vehicle body panels**
- K16 the principles of chassis frame and monocoque vehicle construction
- K17 how to remove vehicle manufacturers original joining techniques
- K18 how to identify manufacturer’s joining techniques and how they may differ to the repair method
- K19 principles of joining techniques ie Spot welding, MIG/MAG, Bonding etc.
Remove and replace motor vehicle body panels

K20  the different types of mechanical fixings for vehicle body panels and when and why they should be used
K21  the repair and welding implications of working with galvanised coatings, mild steels, HSS, UHSS and aluminium alloys
K22  how panel removal and refitting affects the overall body structure of the vehicle
K23  the causes and rectification of distortion resulting from welding
K24  how to find, interpret and use sources of information relevant to the removal and replacement of vehicle body panels and assemblies
K25  how to remove and replace vehicle body panels and assemblies
K26  how to remove and replace door skins
K27  how to establish cut lines for partial panel replacement
K28  how to prepare all edges to be joined
K29  how to select the correct joints and joining processes to match the repair area
K30  the importance and implications of panel clamping and alignment to match existing contours and gaps
K31  how to test resistance spot weld strength
K32  how to load a vehicle onto a jig system to ensure correct alignment and positioning of new panels
K33  how to work safely avoiding damage to the vehicle and its systems
K34  the importance and implications of checking the accuracy of repair work
K35  the types of quality control checks that can be used to ensure correct alignment and contour of panels and the operation of components to manufacturer’s specification
K36  the methods of storing removed components and the importance of storing them correctly and in accordance with legal requirements
Additional Information

**Scope/range relating to performance criteria**

All of the items listed below form part of this National Occupational Standard

1. **Body panels** are
   1.1. non-permanently fixed body panels
   1.2. welded exterior
   1.3. welded sub-structure panels (e.g. rear quarter panel, rear panel, roof, chassis legs, inner wheel housing, boot floors, complete sill, A post, B post, C post, D post and cross members)
   1.4. bonded panels (e.g. any panel that is fixed by adhesive bonding as part of the original manufacturer’s process)

2. **Fitting methods** are
   2.1. welding
   2.2. mechanical fastening
   2.3. adhesive bonding
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