

IMIARC14

Repair automotive body panels



Overview

This NOS is about repairing complex and difficult to access damage to a range of body panel types using a variety of preparation and reinstatement techniques, including hydraulic reforming and panel beating to regain panel contour.

**Performance
criteria**

- You must be able to:
- P1 wear suitable personal protective equipment and use vehicle coverings throughout all vehicle body panel **repair activities** (where appropriate)
 - P2 assess the extent of the damage and verify it is a cosmetic repair
 - P3 identify component materials involved in the construction of the vehicle in the areas that will be worked prior to work commencing
 - P4 inspect, prepare and use all the tools and equipment required following manufacturer's instructions prior to use
 - P5 ensure your methods of preparation leave structural body panels:
 - P5.1 clean and free from contamination
 - P5.2 free from materials likely to hinder repair
 - P5.3 free of surface finishes when required
 - P6 prepare and reinstate **vehicle body panels** using the equipment recommended and following:
 - P6.1 the manufacturer's methods/instructions
 - P6.2 recognised researched repair methods
 - P6.3 your workplace procedures
 - P6.4 health, safety and legal requirements
 - P7 seek guidance from the relevant person(s) promptly where there is the potential for your work to disturb other vehicle systems
 - P8 ensure all test weld pieces conform to the current British Standard for appearance and penetration
 - P9 ensure all repaired body panels are **reinstated** to their original specified shape and dimensions
 - P10 complete repaired components to a condition ready for the refinishing processes
 - P11 complete all **repair activities** within the agreed timescale
 - P12 report any anticipated delays in completion to the relevant person(s) promptly

Knowledge and understanding

Legislative and organisational requirements and procedures

You need to know and understand:

- K1 the health and safety legislation, environmental requirements and workplace procedures relevant to workshop practices and personal and vehicle protection when repairing **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 repairing **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 your workplace procedures for the referral of problems
- K9 the importance of reporting anticipated delays to the relevant persons(s) promptly

Tools and equipment

You need to know and understand:

- K10 the principles governing the selection and use of hand tools for metal finishing and plastic filling repairs
- K11 the factors governing the selection and use of panel beating and hydraulic reforming equipment, including specialist pulling systems
- K12 how to prepare, test, use and maintain the tools and equipment required to repair **vehicle body panels**
- K13 how to adapt hydraulic push equipment to perform pulling operations
- K14 the properties of component materials involved in the construction of the vehicle in the areas that will be worked on during repair
- K15 the types and selection of filling materials, their preparation and application
- K16 the properties, types, grades and use of abrasives used in the vehicle body

panel repair process

- K17 the implications of not following the correct abrasive process and its effect on the overall quality process
- K18 the implications of static when working with plastic components
- K19 the properties and safe use of types of filling materials used to repair panels
- K20 how to mix and apply plastic fillers

Repairing vehicle body panels

You need to know
and understand:

- K21 how to appraise a vehicle for unseen damage such as pedestrian zones
- K22 the consequences of not identifying unseen damage during the appraisal
- K23 how to prepare the vehicle to avoid contamination
- K24 how to assess the extent of damage, including corrosion damage
- K25 the principles of chassis, frame and monocoque vehicle construction
- K26 the principles of resistance spot welding, gas shielded plug welding and gas shielded brazing
- K27 how body panel and component damage can affect other panels and the operation of vehicle systems
- K28 the factors determining the use of specific preparation and repair methods
- K29 the repair and joining technique implications of working with mild, high and ultra high strength steels, aluminium alloys, galvanised coatings
- K30 the consequences of using inappropriate repair methods
- K31 the principles associated with hot and cold shrinking of stretched areas
- K32 how heat can be used to assist reforming
- K33 how heating can affect the properties of steels
- K34 the techniques for identifying the type of plastics used for manufactured components
- K35 the procedures for reinstating anti-corrosion, sealant and sound deadening materials
- K36 the causes and rectification of distortion resulting from welding
- K37 the manufacturer's approved methods of working for the preparation and repair of **vehicle body panels** and components
- K38 the specification for panel shapes, dimensions and tolerances for the vehicles worked upon

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- K39 the type of quality control checks that can be used to ensure the correct contour and standard of finish
 - K40 how to interpret and use sources of information relevant to the repair of **vehicle body panels** and components
 - K41 how to prepare damaged areas to facilitate repairs
 - K42 how to prepare the panel **substrate** prior to filling
 - K43 how to repair corrosion damage
 - K44 how to remove protective materials
 - K45 how to repair and reinstate vehicle body panel contours and components using all the **reinstatement methods** listed in the Scoping Statement below
 - K46 the techniques for reshaping damaged **vehicle body panels** using hand and specialist tools
 - K47 how to check the accuracy of **reinstated** vehicle body panel shape
 - K48 how to finish repairs to a suitable condition for handing on to the painting stage
 - K49 how to work safely avoiding damage to the vehicle and its systems
 - K50 the pedestrian safety aspects of repair-ability of vehicles

Additional information

Scope/range

- 1 **Repair activities** are:
 - 1.1. correction of severely distorted panels
 - 1.2. difficult to access panel damage
 - 1.3. splits on metal panels, using relevant joining technique
 - 1.4. fractures to plastic panels

- 2 **Vehicle body panels** are:
 - 2.1. non-welded non-structural
 - 2.2. welded non-structural
 - 2.3. welded structural panels
 - 2.4. bonded panels

- 3 **Reinstatement methods** are:
 - 3.1. panel beating
 - 3.2. panel shrinking
 - 3.3. hydraulic reforming
 - 3.4. resistance spot welding
 - 3.5. MIG/MAG welding
 - 3.6. MIG brazing
 - 3.7. body filling operations
 - 3.8. metal finishing
 - 3.9. plastic repair
 - 3.10. specialist dent removal methods

- 4 **Substrates** are:
 - 4.1. electro-coated panels
 - 4.2. repaired panels
 - 4.3. original manufacturer's finish
 - 4.4. plastic components
 - 4.5. zinc coated panels
 - 4.6. steel panels
 - 4.7. aluminium panels

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- 4.8. composite panels
 - 4.9. previously primed panels

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