

IMIVBR14	IMIARC14
Identify and rectify major repairs to motor vehicle body panels	Repair automotive body panels
	Overview
This standard 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 retain panel contour and structural integrity.	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	Performance criteria
You must be able to:	You must be able to:
P2 select suitable personal protective equipment to wear and use vehicle coverings throughout all vehicle body panel repair activities	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
P1 identify component materials involved in the construction of the vehicle in the areas that will be worked on during repair, prior to working on the vehicle	P3 identify component materials involved in the construction of the vehicle in the areas that will be worked prior to work commencing
P3 inspect, prepare and use the tools and equipment required following manufacturers' instructions prior to use	P4 inspect, prepare and use all the tools and equipment required following manufacturer's instructions prior to use
P4 use technical information to check that a repair is allowed	
P5 ensure your methods of preparation leave sub-structure body panels clean, free from materials likely to hinder repair/replacement and free of surface finishes when required	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 prepare and reinstate vehicle body panels using the equipment recommended and following:
P6.1 the equipment manufacturer's methods/instructions,	P6.1 the manufacturer's methods/instructions
P6.2 recognised researched repair methods,	P6.2 recognised researched repair methods
P6.3 your workplace procedure as well as	P6.3 your workplace procedures
P6.4 health, safety and legal requirements	P6.4 health, safety and legal requirements
P7 promptly seek guidance from the relevant person(s) where there is the potential for your work to disturb other vehicle systems	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
P8 ensure all repaired body panels are reinstated to their original specified shape, strength and dimensions	P9 ensure all repaired body panels are reinstated to their original specified shape and dimensions
P9 complete repaired components to an agreed condition ready for refinishing processes	P10 complete repaired components to a condition ready for the refinishing processes
P10 complete all repair activities within the agreed timescale	P11 complete all repair activities within the agreed timescale
P11 promptly report any anticipated delays in completion to the relevant person(s)	P12 report any anticipated delays in completion to the relevant person(s) promptly
Knowledge and understanding	Knowledge and understanding
You need to know and understand:	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 and personal and vehicle protection when repairing vehicle body panels	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	K2 the requirements of manufacturer's warranty agreements
K3 the vehicle work specification agreed	K3 the vehicle work specification agreed
K4 your workplace procedures for the referral of problems, reporting of delays to the completion of work and personal protection	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	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	K6 the importance of working to agreed timescales and keeping others informed of progress
K7 the relationship between time, cost and profitability	K7 the relationship between time, cost and profitability
K8 your workplace procedures for the referral of problems	K8 your workplace procedures for the referral of problems
K9 the importance of reporting anticipated delays to the relevant persons(s) promptly	K9 the importance of reporting anticipated delays to the relevant persons(s) promptly
	Tools and equipment
K10 the principles governing the selection and use of hand tools for metal finishing and plastic filling repairs	K10 the principles governing the selection and use of hand tools for metal finishing and plastic filling repairs
K11 the selection and use of panel beating and hydraulic reforming equipment, including specialist pulling systems	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	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	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	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	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	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
K17 the properties and safe use of types of filling materials used to repair panels	K19 the properties and safe use of types of filling materials used to repair panels
K18 how to mix and apply fillers and stoppers used in repair	K20 how to mix and apply plastic fillers
	Repairing vehicle body panels

	K21 how to appraise a vehicle for unseen damage such as pedestrian zones
	K22 the consequences of not identifying unseen damage during the appraisal
K19 how to prepare the vehicle to avoid contamination	K23 how to prepare the vehicle to avoid contamination
K20 how to assess the extent of damage, including corrosion damage	K24 how to assess the extent of damage, including corrosion damage
K21 the principles of chassis frame and monocoque vehicle construction	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
K22 how body panel and component damage can affect other panels and the operation of vehicle systems	K27 how body panel and component damage can affect other panels and the operation of vehicle systems
K23 the factors determining the use of specific preparation and repair methods	K28 the factors determining the use of specific preparation and repair methods
K24 the repair and joining technique implications of working with mild, high and ultra high strength steels, aluminium alloys, galvanised coatings	K29 the repair and joining technique implications of working with mild, high and ultra high strength steels, aluminium alloys, galvanised coatings
K25 the consequences of using inappropriate repair methods	K30 the consequences of using inappropriate repair methods
K26 the principles associated with hot and cold shrinking	K31 the principles associated with hot and cold shrinking of stretched areas
K27 how heat can be used to assist reforming	K32 how heat can be used to assist reforming
K28 how heating can affect the properties of steels	K33 how heating can affect the properties of steels
K29 the techniques for identifying the type of plastics used for manufactured components	K34 the techniques for identifying the type of plastics used for manufactured components
K30 the procedures for reinstating anti-corrosion, sealant and sound deadening materials	K35 the procedures for reinstating anti-corrosion, sealant and sound deadening materials
K31 the causes and rectification of distortion resulting from welding	K36 the causes and rectification of distortion resulting from welding
K32 the manufacturer's approved methods of working for the preparation and repair of vehicle body panels and components and the implications of not following them	K37 the manufacturer's approved methods of working for the preparation and repair of vehicle body panels and components
K33 the specification for panel shapes, dimensions and tolerances for the vehicles worked upon	K38 the specification for panel shapes, dimensions and tolerances for the vehicles worked upon
K34 the type of quality control checks that can be used to ensure the correct contour and standard of finish	K39 the type of quality control checks that can be used to ensure the correct contour and standard of finish
K35 how to interpret and use sources of information relevant to the repair of vehicle body panels and components	K40 how to interpret and use sources of information relevant to the repair of vehicle body panels and components
K36 how to prepare damaged areas to facilitate repairs	K41 how to prepare damaged areas to facilitate repairs
K37 how to prepare the panel surface prior to filling	K42 how to prepare the panel substrate prior to filling
K38 how to repair corrosion damage	K43 how to repair corrosion damage
K39 how to remove protective materials	K44 how to remove protective materials
K40 how to repair and reinstate vehicle body panel contours and retain structural integrity to components	K45 how to repair and reinstate vehicle body panel contours and components using all the reinstatement methods listed in the Scoping Statement below
K41 the techniques for reshaping damaged vehicle body panels using hand and specialist tools	K46 the techniques for reshaping damaged vehicle body panels using hand and specialist tools
K42 how to check the accuracy of reinstated vehicle body panel shape	K47 how to check the accuracy of reinstated vehicle body panel shape
K43 how to complete repair to an agreed condition ready for refinishing process	K48 how to finish repairs to a suitable condition for handing on to the painting stage
K44 how to work safely avoiding damage to the vehicle and its systems	K49 how to work safely avoiding damage to the vehicle and its systems
K45 how pedestrian safety aspects affect the repairability of vehicles	K50 the pedestrian safety aspects of repair-ability of vehicles
K46 understand what can/can't be repaired for safety reasons (ADAS for example), manufacturer and industry agreed standards for these and why these standards must be adhered to	
Scope/range	Scope/range
All of the items listed below form part of this National Occupational Standard.	
1. Repair activities are:	1 Repair activities are:
1.1. correction of severely distorted panels	1.1. correction of severely distorted panels
1.2. to difficult to access panel damage	1.2. difficult to access panel damage
	1.3. splits on metal panels, using relevant joining technique
1.3. to fractures on plastic panels	1.4. fractures to plastic panels
2. Vehicle body panels are:	2 Vehicle body panels are:
2.1. non-permanently fixed panels	2.1. non-welded non-structural
2.2. permanently fixed component	2.2. welded non-structural
2.3. sub-structure component	2.3. welded structural panels
2.4. bonded panels	2.4. bonded panels
3. Reinstatement methods are:	3 Reinstatement methods are:
3.1. panel beating	3.1. panel beating
3.2. panel shrinking	3.2. panel shrinking
3.3. hydraulic reforming	3.3. hydraulic reforming
	3.4. resistance spot welding
	3.5. MIG/MAG welding
	3.6. MIG brazing
3.4. body filling operations	3.7. body filling operations
3.5. metal finishing	3.8. metal finishing
3.6. plastic repair	3.9. plastic repair
3.7. specialist dent removal methods	3.10. specialist dent removal methods
4. Tools and Equipment are:	4 Substrates are:
4.1. workshop equipment	4.1. electro-coated panels
4.2. generic hand tools	4.2. repaired panels
4.3. manufacturer's specified and specialist tools	4.3. original manufacturer's finish
	4.4. plastic components
	4.5. zinc coated panels
	4.6. steel panels
	4.7. aluminium panels
	4.8. composite panels
	4.9. previously primed panel