

**Overview**

This standard is about joining materials correctly and effectively using resistance spot welding techniques.

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## Performance criteria

- You must be able to:
- P1 use the appropriate personal protective equipment (PPE) and check it is fit for purpose before carrying out resistance spot welding operations
  - P2 protect the vehicle, its systems and its contents effectively when carrying out resistance spot welding operations
  - P3 prepare material and align to enable suitable join to be achieved, ensuring mating flanges are treated following manufacturers' procedures before joining
  - P4 select, set up and use the correct tools and equipment in order to correctly carry out resistance spot welding operations
  - P5 ensure that the tools, equipment and personal protective equipment (PPE) you require are in a safe working condition and are correct for the joining operation that you are to be completing
  - P6 set up your equipment to carry out spot welding operations checking:
    - P6.1 suitability of the air supply and pressure
    - P6.2 the current supply
    - P6.3 the consumables are correct
    - P6.4 the suitability/serviceability of electrodes and tips
  - P7 carry out spot welding operations following:
    - P7.1 recognised researched repair methods
    - P7.2 test procedures in accordance with British Standards (peel/sheer/nugget size)
    - P7.3 manufacturer's processes, methods and procedures
    - P7.4 your workplace processes, methods and procedures
    - P7.5 health, safety and legal requirements
  - P8 avoid damaging other components, standards, panels and surfaces on the vehicle and the surrounding work area
  - P9 recognise when your weld is not forming correctly and what action needs to be taken
  - P10 inspect and assess resistance spot weld quality in accordance to British Standards, including weld pitch, indentation/weld profile, heat zone, nugget size and peel and shear test
  - P11 check integrity of weld and record the type of weld achieved on the appropriate

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- paper work. Test pieces must be recorded and stored
- P12 dress and protect the repaired area to inhibit corrosion where applicable
  - P13 clean and store Personal Protective Equipment (PPE) and equipment in appropriate manner
  - P14 promptly report any additional faults you notice during the course of your work to the relevant person(s)
  - P15 promptly report any delays in completing your work to the relevant person(s)
  - P16 carry out resistance spot welding operations within the agreed timescale
  - P17 complete work records accurately, in the format required and promptly pass them to the relevant person(s)

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## Knowledge and understanding

You need to know and understand:

- K1 the health, safety and legal requirements relating to the joining of materials using resistance spot welding techniques
- K2 your workplace procedures for carrying out appropriate risk assessment(s), the referral of problems, reporting of delays to the completion of work and completion of work records
- K3 the constraints of the type of materials used in vehicle construction places on the choice of repair equipment
- K4 how to prepare, test and adjust all equipment required for resistance spot welding techniques
- K5 the work that needs to be done and the standard required
- K6 the requirements for protecting the vehicle and contents from damage before, during and after the joining of materials using resistance spot welding techniques
- K7 the importance of selecting, using and maintaining the appropriate Personal Protective Equipment (PPE) when the joining of materials using resistance spot welding techniques
- K8 how to find, interpret and use sources of information (including repair methods) applicable to the joining of materials using resistance spot welding techniques
- K9 how to select, check, maintain and set up all of the tools and equipment required to correctly join materials using resistance spot welding techniques
- K10 the different types of welding processes, techniques and joints used for the joining of materials when using resistance spot welding techniques
- K11 the correct surface preparation methods to ensure the correct resistance spot weld is achieved and the reasons why surface preparation is important
- K12 the faults and defects that can occur when carrying out resistance spot welding and the common causes of these faults
- K13 the need for correct alignment of materials and the methods used to achieve this
- K14 the types of quality control checks that can be used to ensure correct joining of materials e.g. test coupons

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- K15 how to inspect and assess resistance weld quality in accordance to British Standards including weld pitch, indentation/weld profile, heat zone, nugget size, peel and shear test
  - K16 the correct use of adhesives with resistance spot welding techniques

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**Scope/range**

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

1. **Personal Protective Equipment (PPE)** for resistance spot welding operations includes:
  - 1.1. face mask with appropriate eye protection
  - 1.2. protective/Flame retardant coveralls
  - 1.3. protective/Flame retardant gauntlets
  - 1.4. steel toe cap boots
  - 1.5. appropriate vehicle protection
  - 1.6. appropriate protection for others in the workshop
  - 1.7. appropriate fume mask
  
2. **Tools and Equipment** are:
  - 2.1. workshop equipment
  - 2.2. generic hand tools
  - 2.3. manufacturer's specified and specialist tools
  - 2.4. fume extraction equipment

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