

**Overview**

This unit is about joining materials correctly and effectively using aluminium welding techniques and procedures.

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## Performance criteria

- You must be able to:
- P1 use the appropriate personal protective equipment when carrying out aluminium welding operations
  - P2 protect the vehicle and its contents effectively when carrying out aluminium welding operations
  - P3 prepare material surfaces and align to enable suitable joint 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 aluminium welding operations
  - P5 ensure that the tools, equipment and 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 aluminium welding operations
    - P6.1 check suitability of gas / filler wire and size for material to be joined
    - P6.2 check parameters are set correctly
    - P6.3 check consumables are correct
    - P6.4 feed rollers and welding tip
    - P6.5 test kit
  - P7 carry out aluminium welding operations following:
    - P7.1 recognised researched repair methods(see guidance document)
    - P7.2 test procedures and provide test coupons on equivalent material in accordance with recognised Standards
    - P7.3 Manufacturers processes, methods and procedures
    - P7.4 your workplace procedures
    - P7.5 health, safety and legal requirements
  - P8 avoid damaging other components, units, 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 aluminium weld quality in accordance with industry recognised standards including:
    - P10.1 dye penetrate

P10.2 crack testing

- P11 check integrity of the weld and record the type of weld achieved on the appropriate paper work Test pieces must be recorded and stored
- P12 dress the joint area without reducing material thickness and protect the repaired area to inhibit corrosion where applicable
- P13 clean and store 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 aluminium 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 aluminium welding techniques
- K2 your workplace procedures for:
  - K2.1 the referral of problems
  - K2.2 reporting of delays to the completion of work
  - K2.3 completion of work records
- K3 the work that needs to be done and the standard required
- K4 the requirements for protecting the vehicle and contents from damage before, during and after the joining of materials using aluminium welding operations
- K5 the importance of selecting, using and maintaining the appropriate personal protective equipment when the joining of materials using aluminium welding operations
- K6 how to find, interpret and use sources of information applicable to the joining of materials using aluminium welding operations
- K7 how to select, check, maintain and set up all of the tools and equipment required to correctly join materials using aluminium welding techniques
- K8 the different types of welding processes, techniques and joints used for the joining of materials when using aluminium welding operations
- K9 the correct surface preparation methods to ensure a good aluminium weld is achieved and the reasons why surface preparation is important
- K10 the faults and defects that can occur when carrying out aluminium welding and the common causes of these faults
- K11 the need for correct alignment of materials and the methods used to achieve this
- K12 the types of quality control checks that can be used to ensure correct joining of materials including:
  - K12.1 dye penetrate
  - K12.2 crack tests
- K13 how to inspect and assess aluminium weld quality in accordance with industry recognised standards

- K14 the different types of joint that can be used to join materials using aluminium welding, including
  - K14.1 lap plug
  - K14.2 lap seam
  - K14.3 butt joint
  - K14.4 brace joint
  - K14.5 fillet Joint
- K15 when aluminium welding techniques should be used
- K16 how to ensure cross contamination does not occur and the effect of cross contamination on aluminium

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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 aluminium 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. anti static extraction
  - 2.2. designated aluminium environment
  - 2.3. designated aluminium tooling
  - 2.4. fume extraction

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