

Overview

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

Welding involves the melting of the parent metal which fuses with the filler metal - a total fusion process.

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Performance criteria

- You must be able to:
- P1 use the appropriate personal protective equipment when carrying out MAG welding operations
 - P2 protect the vehicle and its contents effectively when carrying out MAG welding operations
 - P3 prepare material 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 for carrying out MAG welding operations
 - P5 ensure that the tools, equipment and PPE you require are in a safe working condition
 - P6 set up your equipment to carry out MAG 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
 - P7 carry out MAG 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 British 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 MAG weld quality in accordance with British Standards and manufacturers specification
 - P11 check integrity of weld and record the type of weld achieved on the appropriate paper work
 - P12 ensure test pieces are recorded and stored

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- P13 dress the joint area without reducing material thickness and protect the repaired area to inhibit corrosion where applicable
 - P14 clean and store PPE and equipment in appropriate manner
 - P15 promptly report any additional faults you notice during the course of your work to the relevant person(s)
 - P16 promptly report any delays in completing your work to the relevant person(s)
 - P17 carry out MAG welding operations within the agreed timescale
 - P18 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 MAG 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 MAG welding techniques
- K5 the importance of selecting, using and maintaining the appropriate personal protective equipment when the joining of materials using MAG welding techniques
- K6 how to find, interpret and use sources of information applicable to the joining of materials using MAG welding techniques
- K7 how to select, check, maintain and set up all of the tools and equipment required to correctly join materials using MAG welding techniques
- K8 the different types of welding processes, techniques and joints used for the joining of materials when using MAG welding techniques
- K9 the correct surface preparation methods to ensure a good MAG weld is achieved and the reasons why surface preparation is important
- K10 the faults and defects that can occur when carrying out MAG 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
- K13 how to inspect and assess MAG welding in accordance with British Standards
- K14 when MAG welding should be used to join materials
- K15 the advantages of MAG welding techniques over other welding methods
- K16 the different types of joint that can be used to join materials using MAG

welding, including:

K16.1 Lap Plug

K16.2 Lap Seam

K16.3 Butt Joint

K16.4 Fillet Joint

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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 metal active gas (MAG) 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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