



Australian Government

Department of Education, Employment and Workplace Relations

TLIW3014A Weld rail using electric welding process

Release: 1

TLIW3014A Weld rail using electric welding process

Modification History

Not Applicable

Unit Descriptor

Unit Descriptor

This unit involves the skills and knowledge required to weld rails, crossings or switches using an electric welding process in accordance with approved standards, safeworking and regulatory requirements and workplace procedures. It includes preparing rails, crossings or switches for welding; setting up welding equipment; performing the welding operation; checking weld conformance; and completing required documentation. These processes are used to repair rail surface defects and restore rail profile to plain rail, crossings and switches. Licensing or certification requirements may be applicable to this unit.

Application of the Unit

Application of the Unit

Persons achieving competence in this unit will need to fulfil the applicable legislated rail safety requirements including acts and regulations from each state and territory together with any nationally approved compliance codes and/or guidelines.

Work is performed under some supervision, generally within a team environment. It involves the application of routine operational principles and procedures to the welding of rail using an electric welding process as part of workplace activities across a variety of operational contexts within the Australian rail system.

Operators of mechanised equipment must have undertaken training and, where appropriate, hold the relevant licence, permit or certificate and be recognised as competent for the class of machinery being used.

Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Not Applicable

Employability Skills Information

Employability Skills This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1 Prepare rails, crossings or switches for welding	1.1 Weld repair area is identified and assessed in accordance with standards and procedures 1.2 Welding equipment and consumables are prepared and checked for serviceability 1.3 Weld repair area is prepared for welding in accordance with workplace standards and procedures 1.4 Track components are assembled/aligned to specification where required
2 Assemble and set up welding equipment	2.1 Welding machine settings are adjusted to meet welding process requirements 2.2 Accessories and consumables are selected for use 2.3 Welding equipment is assembled and set up for welding
3 Perform welding operation	3.1 Weld metal is applied to repair area to meet specification in accordance with standards and procedures 3.2 Welded area is cleaned in preparation for grinding
4 Check weld conformance	4.1 Finish ground weld area is visually inspected for surface finish and defects 4.2 Finish ground weld area is checked for conformance to rail/crossing/switch profile acceptance standards
5 Complete post-operative checks and documentation	5.1 Welding equipment is checked for serviceability 5.2 Defective equipment is replaced 5.3 Documentation on work undertaken is completed in accordance with workplace requirements

Required Skills and Knowledge

REQUIRED KNOWLEDGE AND SKILLS

This describes the essential knowledge and skills and their level required for this unit.

Required knowledge:

- Relevant safety, OH&S and environmental procedures and regulations
- Workplace procedures for the welding of rail using an electric welding process
- Problems that may occur during the welding of rail using an electric welding process, and action that can be taken to report or resolve the problems
- Hazards that may exist during the welding of rail using an electric welding process, and ways of controlling the risks involved

REQUIRED KNOWLEDGE AND SKILLS

- Fundamentals of track and components
- Track standards for rail, crossing and switch condition and surface profile
- Acceptance standards for weld repairs on rail
- Relevant communication systems and procedures
- Authorisation/approval processes and procedures
- Documentation and record keeping requirements

Required skills:

- Communicate effectively with others when welding rail using an electric welding process
- Read and interpret technical data, drawings, instructions and manuals relevant to the welding of rail using an electric welding process
- Interpret and follow operational instructions and prioritise work when welding rail using an electric welding process
- Complete documentation related to the welding of rail using an electric welding process
- Operate communication equipment to required protocol
- Work collaboratively with others when welding rail using an electric welding process
- Promptly report and/or rectify any identified problems, faults or malfunctions that may occur when welding rail using an electric welding process in accordance with regulatory requirements and workplace procedures
- Implement contingency plans for unexpected events when welding rail using an electric welding process
- Monitor work activities in terms of planned schedule
- Modify activities depending on differing operational contingencies, risk situations and environments
- Work systematically with required attention to detail without injury to self or others, or damage to goods or equipment
- Operate and adapt to differences in equipment in accordance with standard operating procedures
- Select and use required personal protective equipment
- Select and use hand tools, power tools and equipment

Evidence Guide

EVIDENCE GUIDE

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required knowledge and skills, the range statement and the assessment

EVIDENCE GUIDE

guidelines for this Training Package.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

- The evidence required to demonstrate competency in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria of this unit and include demonstration of applying:
 - the underpinning knowledge and skills
 - relevant legislation and workplace procedures
 - other relevant aspects of the range statement
- Assessment must include exercises which demonstrate competent performance of the following in a range of situations:
 - preparing items for welding according to workplace requirements
 - assembling and setting up welding equipment and preparing consumables
 - performing welding operation on rails, crossings or switches
 - ensuring weld conformance to workplace requirements
 - completing documentation in accordance with workplace requirements

Context of and specific resources for assessment

- Performance is demonstrated consistently over a period of time and in a suitable range of contexts
- Resources for assessment include:
 - a range of relevant exercises, case studies and/or other simulated practical and knowledge assessment, and/or
 - access to an appropriate range of relevant operational situations in the workplace
- In both real and simulated environments, access is required to:
 - relevant and appropriate materials and equipment, and
 - applicable documentation including workplace procedures, regulations, codes of practice and operation manuals

Method of assessment

- Assessment of this unit must be undertaken by a registered training organisation
- As a minimum, assessment of knowledge must be conducted through appropriate written/oral tests
- Practical assessment must occur:

EVIDENCE GUIDE

- through activities in an appropriately simulated environment at the registered training organisation, and/or
- in an appropriate range of situations in the workplace

Range Statement

RANGE STATEMENT

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance.

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| Operations may be conducted: | <ul style="list-style-type: none">• by day or night• in all weather conditions |
| Work may be conducted in: | <ul style="list-style-type: none">• restricted spaces• exposed conditions• controlled or open environments |
| Work may involve exposure to: | <ul style="list-style-type: none">• chemicals• dangerous or hazardous substances• movements of equipment, goods and vehicles |
| Types of weld repairs may vary according to: | <ul style="list-style-type: none">• welding process location• rail mass or type• crossing and switch type• rail, switch and crossing material |
| Welding process may include: | <ul style="list-style-type: none">• flux core arc welding• manual metal arc welding |
| Welding equipment may include: | <ul style="list-style-type: none">• electric welders• generators• wirefeed welding unit• electrode holder• robotic welder |
| Equipment may include: | <ul style="list-style-type: none">• mechanical handling/lifting equipment• hand tools including impact wrenches, tie tampers, gauges, track jacks, spiking hammers and bars• wire brushes• rail thermometers and/or 'thermomelt' crayons• cutting and boring equipment• fastening equipment• fume extraction equipment for use with welding |

RANGE STATEMENT

	manganese
Materials may include:	• flux core wire • welding electrodes
Liaison may include:	• internal or external personnel from other work areas (e.g. train controllers, electricians)
Depending on the type of organisation concerned and the local terminology used, workplace procedures may include:	• company procedures • enterprise procedures • organisational procedures • established procedures
Communications equipment may include:	• two-way radios • telephones/mobile phones • agreed audible or hand signal
Depending on the work context, safety and personal protective equipment may include:	• high visibility clothing • long pants and shirts • hearing protection • long gloves • spats • sunscreen • sunglasses • welding helmet • safety glasses • insect repellent • safety headwear • safety footwear • portable radios/mobile phones • hand lamps • flags • safety devices • special PPE when welding manganese
Information/documents may include:	• operational instructions, policies and workplace procedures • local authority regulations and procedures • information provided by other workplace personnel • rail inspections and reports • work orders • technical instructions • manufacturers or workplace equipment instructions and operation manuals • emergency procedure manuals • two-way radio/mobile phone operation procedures

RANGE STATEMENT

Applicable procedures and codes may include:

- QA plans, data and document control
- conditions of service, legislation and industrial agreements including workplace agreements and awards
- applicable legislated rail safety requirements including acts and regulations from each state and territory together with any nationally approved compliance codes and/or guidelines
- relevant Australian Standards and related requirements, including AS 4292
- relevant state/territory OH&S legislation
- relevant state/territory environmental protection legislation

Unit Sector(s)

Not Applicable

Competency Field

Competency Field

W - Equipment and Systems Operations