



**Australian Government**

# **AURVTW004 Carry out tungsten inert gas welding**

**Release: 1**

## AURVTW004 Carry out tungsten inert gas welding

### Modification History

| Release   | Comment                 |
|-----------|-------------------------|
| Release 1 | New unit of competency. |

### Application

This unit describes the performance outcomes required to carry out welding operations using tungsten inert gas (TIG) welding. It involves preparing for the task, selecting and using TIG welding equipment, setting gas flow pressures and welder settings, selecting and using suitable personal protective equipment (PPE), performing welding to given specifications, inspecting and testing weld quality, and completing workplace processes and documentation.

It applies to those working in the automotive service and repair industry.

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

### Competency Field

Vehicle body

### Unit Sector

Technical - Welding, Grinding, Machining and Soldering

### Elements and Performance Criteria

| Elements                                  | Performance Criteria                                                                                                                                                                                                                                                                     |
|-------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Elements describe the essential outcomes. | Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold and italicised text is used, further information is detailed in the range of conditions section.                                                                              |
| 1. Plan and prepare to weld               | 1.1 Job requirements are determined from workplace instructions<br>1.2 <b>Welding information</b> is accessed and interpreted<br>1.3 Hazards associated with the work are identified and risks are managed<br>1.4 <b>Tools and equipment</b> are selected and checked for serviceability |

| <b>Elements</b>                           | <b>Performance Criteria</b>                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
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|                                           | 1.5 Work area is prepared and work is planned to carry out TIG welding, minimise waste, and use time efficiently                                                                                                                                                                                                                                                                                                                          |
| 2. Weld materials using TIG welder        | 2.1 TIG welding equipment is prepared, set up and adjusted for specific welding job requirement<br>2.2 TIG welding equipment is used according to manufacturer operating procedures and <b><i>safety and environmental requirements</i></b><br>2.3 Weld test runs are conducted according to workplace instructions and weld specifications<br>2.4 Materials are welded using standard or inverter TIG process to industry standards      |
| 3. Check welds                            | 3.1 Welds are cleaned using appropriate tools and techniques and according to workplace instructions<br>3.2 Weld specifications and quality requirements are checked and confirmed by non-destructive inspection<br>3.3 Weld defects are identified, prepared for re-welding as required, and appropriate personnel are notified                                                                                                          |
| 4. Complete work processes                | 4.1 Final inspection is made to ensure work meets workplace expectations and component is presented ready for use<br>4.2 Work area is cleaned, waste and non-recyclable materials are disposed of, and recyclable material is collected and stored<br>4.3 Tools and equipment are checked, reported if faulty, and stored according to workplace procedures<br>4.4 Workplace documentation is processed according to workplace procedures |

## Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance and are not explicit in the performance criteria.

| <b>Skills</b>             | <b>Description</b>                                                                                         |
|---------------------------|------------------------------------------------------------------------------------------------------------|
| Learning skills to:       | <ul style="list-style-type: none"> <li>locate appropriate sources of information efficiently.</li> </ul>   |
| Writing skills to:        | <ul style="list-style-type: none"> <li>legibly and accurately fill out workplace documentation.</li> </ul> |
| Oral communication skills | <ul style="list-style-type: none"> <li>clarify instructions and procedures</li> </ul>                      |

| Skills                             | Description                                                                                                                                                                                     |
|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| to:                                | <ul style="list-style-type: none"> <li>clearly report quality issues and job outcomes.</li> </ul>                                                                                               |
| Numeracy skills to:                | <ul style="list-style-type: none"> <li>identify and set TIG welder settings</li> <li>identify weld measurements from job requirements</li> <li>measure material from specifications.</li> </ul> |
| Planning and organising skills to: | <ul style="list-style-type: none"> <li>plan own work requirements and prioritise actions to achieve required outcomes and ensure tasks are completed within workplace timeframes.</li> </ul>    |
| Problem solving skills to:         | <ul style="list-style-type: none"> <li>identify defects, quality issues and potential problems associated with TIG welding processes and refer problems to appropriate person.</li> </ul>       |
| Technology skills to:              | <ul style="list-style-type: none"> <li>use specialist TIG equipment.</li> </ul>                                                                                                                 |

## Range of Conditions

This section specifies work environments and conditions that may affect performance.

Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

Bold italicised wording, if used in the performance criteria, is detailed below.

|                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b><i>Welding information</i></b> must include:                   | <ul style="list-style-type: none"> <li>manufacturer operating procedures</li> <li>national standards and codes of practice for welding</li> <li>workplace procedures.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b><i>Tools and equipment</i></b> must include:                   | <ul style="list-style-type: none"> <li>standard and inverter TIG equipment</li> <li>tungsten electrodes</li> <li>protective screens and fume extraction system</li> <li>shielding gas</li> <li>filler rods</li> <li>PPE, including approved welding helmets.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                           |
| <b><i>Safety and environmental requirements</i></b> must include: | <ul style="list-style-type: none"> <li>work health and safety (WHS), and occupational health and safety (OHS) requirements, including procedures for: <ul style="list-style-type: none"> <li>selecting and using PPE for TIG welding, including approved welding helmets</li> <li>using specialist welding tools and equipment</li> <li>using protective screens and fume extraction system</li> <li>manually handling vehicle components and TIG equipment</li> <li>identifying and controlling hazards</li> </ul> </li> <li>environmental requirements, including procedures for trapping, storing and disposing of waste materials.</li> </ul> |

## Unit Mapping Information

Equivalent to AURVTW2004 Carry out gas tungsten arc welding procedures

## Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b4278d82-d487-4070-a8c4-78045ec695b1>

## Assessment Requirements for AURVTW004 Carry out tungsten inert gas welding

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### Performance Evidence

Before competency can be determined, individuals must demonstrate they can perform the following according to the standard defined in this unit's elements, performance criteria, range of conditions and foundation skills:

- carry out tungsten inert gas (TIG) welding to the following material sections:
  - 150 mm long:
    - aluminium
    - steel
    - stainless steel
  - perform the above TIG welding in the following weld positions:
    - butt
    - outside corner
    - fillet
    - lap.

### Knowledge Evidence

Individuals must be able to demonstrate knowledge of:

- work health and safety (WHS), and occupational health and safety (OHS) requirements relating to carrying out TIG welding, including procedures for:
  - selecting and using personal protective equipment (PPE) for TIG welding, including approved welding helmets
  - using specialist welding tools and equipment
  - using protective screens and fume extraction system
  - manually handling vehicle components and TIG equipment
  - identifying and controlling hazards

- environmental requirements, including procedures for trapping, storing and disposing of waste materials
- different types of shielding gases used in TIG welding
- TIG manufacturer operating procedures
- material and consumable preparation techniques, including:
  - aluminium
  - steel
  - stainless steel
- procedures for setting up and operating TIG equipment
- methods and techniques for TIG welding, including:
  - welding positions:
    - butt
    - outside corner
    - fillet
    - lap
  - weld distortion and distortion control techniques
  - TIG testing procedures, including procedures for visual or non-destructive weld testing
- procedures for identifying and rectifying weld defects, including:
  - lack of penetration
  - excessive weld build-up
  - excess heat
  - undercut
  - heat affected zone
- procedures for protecting vehicle electronics during TIG welding
- procedures for final inspection of welded components.

## Assessment Conditions

Assessors must satisfy NVR/AQTF assessor requirements.

Competency is to be assessed in the workplace or a simulated environment that accurately reflects performance in a real workplace setting.

Assessment must include direct observation of tasks.

Where assessment of competency includes third-party evidence, individuals must provide evidence that links them to TIG welding that they have carried out, e.g. work orders.

Assessors must verify performance evidence through questioning on skills and knowledge to ensure correct interpretation and application.

The following resources must be made available:

- automotive repair workplace or simulated workplace
- workplace instructions
- TIG equipment operating instructions

- PPE required for TIG welding
- protective screens and fume extraction system
- TIG welder and shielding gases
- TIG consumables
- materials specified in the performance evidence requiring TIG welding
- tools, equipment and materials appropriate for carrying out TIG welding.

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