



**Australian Government**

# **AURRTQ3003 Install inboard propeller drive systems**

**Release 1**

## AURRTQ3003 Install inboard propeller drive systems

### Modification History

| Release   | Comment                                                                                                                                                                         |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Release 1 | Replaces AURR313631A Install inboard propeller drive systems<br>Unit code updated to meet policy requirements<br>Reference to OHS legislation replaced with new WHS legislation |

### Unit Descriptor

|                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
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| <b>Unit descriptor</b> | <p>This unit of competency describes the skills and knowledge required to install and commission inboard propeller drive systems and associated components on vessels.</p> <p>It requires the ability to identify and confirm work requirements, prepare for, install and test inboard propeller systems and complete work finalisation processes.</p> <p>No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.</p> |
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### Application of the Unit

|                                |                                                                                                                                                |
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| <b>Application of the unit</b> | <p>This unit applies to individuals who undertake the installation and commissioning of inboard propeller systems in a marine environment.</p> |
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### Licensing/Regulatory Information

Not applicable.

### Pre-Requisites

Not applicable.

## Employability Skills Information

|                             |                                          |
|-----------------------------|------------------------------------------|
| <b>Employability skills</b> | This unit contains employability skills. |
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## Elements and Performance Criteria Pre-Content

|                                                                   |                                                                                                                                                                        |
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| Elements describe the essential outcomes of a unit of competency. | Performance criteria describe the performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide. |
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## Elements and Performance Criteria

| ELEMENT                                                                     | PERFORMANCE CRITERIA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Prepare for work                                                         | 1.1. Confirm nature and scope of work to be carried out<br>1.2. Locate workplace health and safety (WHS) and workplace environmental and sustainable procedures and practices, applicable to the work<br>1.3. Source installation procedures and relevant workshop manuals and manufacturer information<br>1.4. Determine installation method in accordance with WHS, environmental and industry regulations, and guidelines and enterprise procedures<br>1.5. Set up work area                                                                        |
| 2. Install and commission propeller drive systems and associated components | 2.1. Carry out propeller drive system installation in accordance with manufacturer and component supplier specifications, and WHS and workplace environmental and sustainable procedures and practices<br>2.2. Test propeller drive systems for correct operation, make required adjustments and re-test<br>2.3. Commission propeller drive system<br>2.4. Check that protective guards, cowlings and safety features are in place according to workplace expectations<br>2.5. Determine the need for water testing of vessel's propeller drive system |
| 3. Clean up work area and maintain equipment                                | 3.1. Make final inspection of propeller drive system<br>3.2. Clean and inspect equipment and tooling according to workplace requirements<br>3.3. Tag unserviceable equipment and faults identified in accordance with workplace requirements<br>3.4. Finalise and process work completion documentation, update customer and warranty information and give to appropriate persons as required<br>3.5. Clean work area, dispose of waste and scrap, and store tools and equipment in accordance with workplace procedures                               |

## Required Skills and Knowledge

### REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit.

#### Required skills

Required skills include:

- technical skills to the level required to use workplace technology related to the installation of inboard propeller systems, to perform diagnosis and repair actions, and to use workplace computerised technology for the reporting and recording of actions
- communication skills to the level required to confirm work requirements and specifications, to communicate effectively regarding work requirements with supervisor, other workers and customers, to relate to people from a range of social, cultural and ethnic backgrounds and of varying physical and mental abilities, and to report work outcomes and problems
- literacy skills to the level required to understand information related to work orders, including common industry terminology and safety procedures, to interpret technical information and specifications, and to record servicing details
- numeracy skills to the level required to correctly calculate time, assess tolerances, apply accurate measurements, calculate material requirements and establish quality checks
- problem-solving skills to the level required to identify technical and procedural problems to avoid planning and scheduling problems, and time and material wastage
- team skills to the level required to work effectively and cooperatively with others to optimise workflow and productivity

#### Required knowledge

Required knowledge includes:

- selection and installation procedures, including component and assembly removal and placement
- operating principles of jet propulsion drive systems
- measuring and testing procedures
- types of lubricants and application methods
- commissioning procedures
- service and repair manuals (hard copy and electronic)
- manufacturer and component supplier specifications, including workshop manuals and repair guides
- applicable commonwealth, state or territory legislation, regulations, standards and codes of practice, including WHS, personal safety and environment, relevant to installing inboard propeller systems
- organisational policies and procedures, including quality, reporting and recording

**REQUIRED SKILLS AND KNOWLEDGE**

procedures, related to installing inboard propeller systems

## Evidence Guide

| <b>EVIDENCE GUIDE</b>                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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| The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Overview of assessment</b>                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Critical aspects for assessment and evidence required to demonstrate competency in this unit</b>                                                                                                                    | <p>Assessors must be satisfied that the candidate can competently and consistently:</p> <ul style="list-style-type: none"> <li>• observe safety procedures and requirements</li> <li>• communicate effectively with others involved in or affected by the work</li> <li>• select methods and techniques which are appropriate to the circumstances</li> <li>• complete preparatory activity in a systematic manner</li> <li>• install a minimum of three (3) inboard propeller drive systems to workplace and manufacturer and component supplier requirements within workplace timeframes</li> <li>• test prior to placing in service</li> <li>• complete workplace and equipment records and workplace clean-up requirements.</li> </ul>                                                                                                                                                                                                                                                                                                                     |
| <b>Context of, and specific resources for assessment</b>                                                                                                                                                               | <ul style="list-style-type: none"> <li>• The application of competency is to be assessed in the workplace or a simulated environment that reflects as far as possible the actual working environment.</li> <li>• Assessment is to occur using standard and authorised work practices, safety requirements and environmental constraints.</li> <li>• Assessment is to comply with relevant regulatory requirements, including specified Australian standards.</li> <li>• Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability.</li> <li>• The following resources should be made available: <ul style="list-style-type: none"> <li>• workplace location or simulated workplace</li> <li>• materials relevant to the installation of an inboard propeller drive system</li> <li>• equipment, hand and power tools appropriate to installation of propeller drive systems</li> <li>• specifications and work instructions.</li> </ul> </li> </ul> |
| <b>Method of assessment</b>                                                                                                                                                                                            | <ul style="list-style-type: none"> <li>• Assessment must satisfy the endorsed Assessment Guidelines of this Training Package.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

**EVIDENCE GUIDE**

|                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                            | <ul style="list-style-type: none"> <li>Assessment methods must confirm consistency and accuracy of performance (over time and in a range of workplace relevant contexts) together with application of Required Skills and Knowledge.</li> <li>Assessment methods must be by direct observation of tasks and include questioning on Required Skills and Knowledge to ensure its correct interpretation and application.</li> <li>Assessment may be applied under project-related conditions (real or simulated) and require evidence of process.</li> <li>Assessment must confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances.</li> <li>Competence in this unit may be assessed in conjunction with other functional units which together form part of the holistic work role.</li> </ul> |
| <b>Guidance information for assessment</b> | Assessment processes and techniques must be culturally sensitive and appropriate to the language and literacy capacity of the candidate and the work being performed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

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

**Marine inboard propeller drive systems**

Marine inboard propeller drive systems may include:

- sterntube
- 'A' frame strut
- 'T' strut
- cutlass bearing
- fibre bearing

**Marine engines**

Marine engines may include:

| <b>RANGE STATEMENT</b>           |                                                                                                                                                                                                                                                                                                                                                   |
|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                  | <ul style="list-style-type: none"> <li>• 2-stroke petrol</li> <li>• 4-stroke diesel and petrol</li> </ul>                                                                                                                                                                                                                                         |
| <b>Vessels</b>                   | <p>Vessels may include:</p> <ul style="list-style-type: none"> <li>• single or multi-hull</li> <li>• inboard or outboard drive</li> </ul>                                                                                                                                                                                                         |
| <b>Recommissioning</b>           | <p>Recommissioning may include:</p> <ul style="list-style-type: none"> <li>• engine system inspection</li> <li>• reading service data</li> <li>• compiling reports</li> <li>• testing, inspecting, adjusting, cleaning, and repairing components and systems</li> </ul>                                                                           |
| <b>Installation</b>              | <p>Installation may include:</p> <ul style="list-style-type: none"> <li>• minor adjustments, alignment and operational testing</li> <li>• functional operation, including tank</li> <li>• functional operation and testing of components, including propeller shaft, skeg, propeller and couplings</li> </ul>                                     |
| <b>Tooling and equipment</b>     | <p>Tooling and equipment may include:</p> <ul style="list-style-type: none"> <li>• hand tools</li> <li>• testing equipment, including multimeters</li> <li>• power tools</li> <li>• air tools</li> <li>• specialist tools and equipment</li> </ul>                                                                                                |
| <b>Materials</b>                 | <p>Materials may include:</p> <ul style="list-style-type: none"> <li>• spare parts</li> <li>• lubricants</li> <li>• fluids</li> <li>• cleaning materials</li> </ul>                                                                                                                                                                               |
| <b>Safe operating procedures</b> | <p>Safe operating procedures may include:</p> <ul style="list-style-type: none"> <li>• operational risk assessment and treatments</li> <li>• toxic substances</li> <li>• electrical safety</li> <li>• machinery movement and operation</li> <li>• manual and mechanical lifting and shifting</li> <li>• working in proximity to others</li> </ul> |

**RANGE STATEMENT****Information/documents**

Information/documents may include:

- verbal, written and graphical instructions issued by authorised internal and external persons
- parts listing prices and catalogues
- inventory systems
- material safety data sheets (MSDS)
- diagrams or sketches
- engineer's design specifications and instructions
- manufacturer specifications
- industry standards (e.g. American Boat and Yacht Council, National Marine, Manufacturer's Association and US Coast Guard)
- Australian standards
- workplace specifications and requirements

**Legislative requirements**

Legislative requirements are to be in accordance with applicable commonwealth, state or territory legislation, regulations, certification requirements and codes of practice, and may include:

- award and enterprise agreements
- industrial relations
- Australian standards
- Australian Design Rules
- confidentiality and privacy
- WHS
- the environment
- equal opportunity
- anti-discrimination
- duty of care

**WHS requirements**

WHS requirements are to be in accordance with applicable commonwealth, state or territory legislation and regulations, and organisational safety policies and procedures, and may include:

- personal protective equipment and clothing
- safety equipment
- first aid equipment
- hazard and risk control
- elimination of hazardous materials and

| <b>RANGE STATEMENT</b>                        |                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                               | substances <ul style="list-style-type: none"> <li>• manual handling, including shifting, lifting and carrying</li> <li>• emergency procedures</li> <li>• road rules</li> <li>• safe driving policy</li> </ul>                                                                                                                                                                                                      |
| <b>Environmental requirements</b>             | Environmental requirements may include: <ul style="list-style-type: none"> <li>• waste management</li> <li>• noise</li> <li>• dust</li> <li>• clean-up management</li> </ul>                                                                                                                                                                                                                                       |
| <b>Organisational policies and procedures</b> | Organisational policies and procedures may include: <ul style="list-style-type: none"> <li>• quality policies and procedures, including Australian standards</li> <li>• WHS, sustainability, environment, equal opportunity and anti-discrimination</li> <li>• manufacturer specifications and industry codes of practice</li> <li>• safe work procedures</li> <li>• reporting and recording procedures</li> </ul> |

## Unit Sector(s)

|                    |        |
|--------------------|--------|
| <b>Unit sector</b> | Marine |
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## Co-requisite units

Not applicable.

## Competency field

|                         |                                        |
|-------------------------|----------------------------------------|
| <b>Competency field</b> | Technical - Driveline and Final Drives |
|-------------------------|----------------------------------------|