



Australian Government

AURRTD001 Diagnose and repair marine steering systems

Release: 1

AURRTD001 Diagnose and repair marine steering systems

Modification History

Release	Comment
Release 1	New unit of competency.

Application

This unit describes the performance outcomes required to diagnose and repair faults in the wire and rope, push and pull type cable, hydraulic and chain steering systems of marine vessels. It involves preparing for the task, selecting the correct diagnostic procedure, carrying out the diagnosis and the repair, performing post-repair testing, and completing workplace processes and documentation.

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

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

Competency Field

Marine

Unit Sector

Technical - Steering and Suspension

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. Prepare to diagnose and repair marine steering system	1.1 Job requirements are determined from workplace instructions 1.2 Diagnostic information is sourced and interpreted 1.3 Diagnostic options are analysed and those most appropriate to the circumstances are selected 1.4 Hazards associated with the work are identified and risks are

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.
	managed 1.5 Diagnostic tools and equipment are selected and checked for serviceability
2. Diagnose steering system	2.1 Diagnostic tests are carried out according to workplace procedures and safety requirements 2.2 Faults are identified from diagnostic test results and causes of faults are determined 2.3 Diagnosis findings, including recommendations for necessary repairs or adjustments, are reported according to workplace procedures
3. Repair steering system	3.1 Repair information is sourced and interpreted 3.2 Repair options are analysed and those most appropriate to the circumstances are selected 3.3 Repair tools, equipment and materials are selected and checked 3.4 Repairs and component replacements and adjustments are carried out according to manufacturer specifications, workplace procedures and safety requirements, and without causing damage to components or systems 3.5 Post-repair testing is carried out according to workplace procedures to confirm fault rectification, and any further problems detected as having been introduced during the repair process are rectified
4. Complete work processes	4.1 Final inspection is made to ensure work is to workplace expectations and vessel is presented ready for use 4.2 Work area is cleaned, waste and non-recyclable materials are disposed of, and recyclable material is collected 4.3 Tools and equipment are checked and stored according to workplace procedures 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.

Skills	Description
---------------	--------------------

Skills	Description
Learning skills to:	locate appropriate sources of information efficiently.
Reading skills to:	interpret information from manufacturer and workshop literature when seeking marine steering system specifications and procedures.
Writing skills to:	legibly and accurately fill out workplace documentation when reporting diagnostic findings, making repair recommendations, and recording parts and material used.
Oral communication skills to:	- clarify instructions - report diagnostic findings and make repair recommendations.
Numeracy skills to:	measure marine steering system components and use basic mathematical operations, including addition and subtraction, to calculate distances, tolerances and deviations from manufacturer specifications.
Planning and organising skills to:	plan own work requirements and prioritise actions to achieve required outcomes and ensure tasks are completed within workplace timeframes.
Technology skills to:	use measuring equipment, such as vernier calipers.

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.

<i>Safety requirements</i> must include:	- work health and safety (WHS) and occupational health and safety (OHS) requirements, including procedures for: - avoiding pinch points when operating steering systems - working with high hydraulic oil pressures.
---	--

Unit Mapping Information

Equivalent to AURRTD3001 Diagnose and repair marine steering systems

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 AURRTD001 Diagnose and repair marine steering systems

Modification History

Release	Comment
Release 1	New unit of competency.

Performance Evidence

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

- diagnose and repair a fault in two of the following marine steering systems:
 - mechanical cable
 - hydraulic steering
 - electrohydraulic steering.

Knowledge Evidence

Individuals must be able to demonstrate knowledge of:

- work health and safety (WHS) and occupational health and safety (OHS) requirements relating to diagnosing and repairing marine steering systems, including:
 - procedures for avoiding pinch points when operating steering systems
 - procedures for working with high hydraulic oil pressures
 - methods for determining safe working loads of ropes, chains and cables
- operating principles of marine steering systems and associated components, including:
 - rudders and the principle of unequal water pressures
 - propwash
- application, purpose and operation of marine steering systems and components, including:
 - rope, cable and chain systems
 - inboard steering systems, including:
 - steering gear
 - balanced and unbalanced rudders
 - electrohydraulic steering

- outboard engine steering, including:
 - mechanical cable
 - hydraulic steering
 - electrohydraulic steering
- stern drive steering, including:
 - power steering
 - electrohydraulic steering
- bow and stern thrusters, including:
 - electric systems
 - hydraulic systems
- diagnostic testing procedures for marine steering systems, including:
 - rudder wear down
 - mechanical cable testing, including:
 - helm evaluation, including backlash
 - draglink wear
 - hydraulic system testing, including:
 - pressure testing
 - testing system for air
 - draglink wear
 - electrohydraulic system testing, including:
 - pressure testing
 - component electrical testing
- repair procedures for marine steering systems, including procedures for:
 - selecting steering system appropriate to vessel
 - dismantling, repairing and lubricating steering system components
 - replacing components
 - replacing helm and ram seal
 - identifying and measuring cables
- post-repair testing procedures for marine steering systems, including procedures for testing for smooth operation and full range of movement.

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 the marine steering systems that they have worked on, e.g. repair 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:

- marine repair workplace or simulated workplace
- workplace instructions
- manufacturer steering system specifications
- marine vessels with faults in the steering systems specified in the performance evidence
- diagnostic equipment for marine steering systems
- tools, equipment and materials appropriate for repairing and adjusting marine steering systems.

Links

Companion Volume implementation guides are found in VETNet -

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

Companion Volume implementation guides are found in VETNet -

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