



Australian Government

AURRTQ004 Diagnose and repair marine inboard propeller drive systems

Release: 1

AURRTQ004 Diagnose and repair marine inboard propeller drive 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 inboard propeller drive 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 - Driveline and Final Drives

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 an inboard propeller drive 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

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.
	1.4 Hazards associated with the work are identified and risks are managed 1.5 Diagnostic tools and equipment are selected and checked for serviceability
2. Diagnose propeller drive system	2.1 Diagnostic tests are performed 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 are reported according to workplace procedures, including recommendations for necessary repairs or adjustments
3. Repair propeller drive 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 or stored according to workplace procedures 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
Learning skills to:	locate appropriate sources of information efficiently.
Reading skills to:	interpret information from manufacturer and workshop literature when seeking inboard propeller drive 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 inboard propeller drive 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 precision measuring equipment, such as micrometers and dial indicators.

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 working with rotating shafts.
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Unit Mapping Information

Equivalent to AURRTQ3004 Diagnose and repair inboard propeller drive 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 AURRTQ004 Diagnose and repair marine inboard propeller drive systems

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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 three different marine inboard propeller drive systems, including two of the following:
 - direct drive
 - V-drive
 - drop-centre.

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 inboard propeller drive systems, including procedures for working with rotating shafts
- application, purpose and operation of inboard propeller drive systems and components, including:
 - direct drive, including:
 - drive plate
 - transmission (forward, neutral and reverse)
 - coupling and key
 - propeller shaft
 - gland
 - log
 - strut, including A frame and I type
 - bearing, including cutlass and fibre bearings

- propeller
- V-drive, including:
 - drive plate
 - jack shaft
 - transmission (forward, neutral and reverse)
 - coupling and key
 - propeller shaft
 - gland
 - log
 - strut, including A frame and I type
 - bearing, including cutlass and fibre bearings
 - propeller
- drop-centre drive, including:
 - drive plate
 - transmission (forward, neutral and reverse)
 - coupling and key
 - propeller shaft
 - gland
 - log
 - strut, including A frame, I type and stern tube
 - bearing, including cutlass and fibre bearings
 - propeller
- diagnostic testing procedures for inboard propeller drive systems, including:
 - propeller shaft wear, including trueness and run-out
 - bearing wear and run-out measurements
 - coupling alignment checking methods, including laser and feeler gauge procedures
 - engine and transmission mount testing procedures
- dismantling procedures for inboard propeller drive systems, including procedures for:
 - using propeller pullers
 - using bearing pullers
 - applying heat and cooling
 - inspecting components, including shaft run-out
- repair procedures for inboard propeller drive systems, including procedures for replacing couplings and bearings
- assembly procedures for inboard propeller drive systems, including procedures for:
 - checking and adjusting propeller shaft run-out
 - aligning couplings
- post-repair testing procedures for inboard propeller drive systems, including procedures for water testing.

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 inboard propeller drive systems in marine vessels 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 inboard propeller drive system specifications
- three different marine vessels with faults in the inboard propeller drive systems specified in the performance evidence
- diagnostic equipment for inboard propeller drive systems
- tools, equipment and materials appropriate for repairing and adjusting marine inboard propeller drive systems.

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