



Australian Government

AURRTQ104 Diagnose and repair marine inboard propeller drive systems

Release: 1

AURRTQ104 Diagnose and repair marine inboard propeller drive systems

Modification History

Release	Comments
Release 1	This version first released with AUR Automotive Retail, Service and Repair Training Package Version 6.0

Application

This unit describes the skills and knowledge required to diagnose and repair inboard propeller drive systems of marine vessels. The unit involves preparing for the task, sourcing a diagnostic testing strategy, diagnosing the cause of the fault, carrying out the repair, performing post-repair testing, and completing workplace processes and documentation.

This unit 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.

Unit Sector

Marine Technical – Driveline and Final Drives

Elements and Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1. Prepare to diagnose and repair marine inboard propeller drive system	1.1 Identify job requirements from workplace instructions 1.2 Identify required information for diagnosis activity 1.3 Analyse diagnostic options and source testing strategy to identify cause of fault using workplace and manufacturer procedures 1.4 Identify hazards and environmental issues associated with diagnose and repair activity, assess potential risks and implement control measures in line with workplace policies and procedures 1.5 Identify tools and equipment required for testing strategy and establish serviceability according to workplace

ELEMENTS	PERFORMANCE CRITERIA
	procedures
2. Diagnose marine inboard propeller drive system	2.1 Implement diagnostic tests set out in testing strategy according to manufacturer and workplace procedures, and workplace health and safety requirements 2.2 Identify cause of fault through analysis of diagnostic test results 2.3 Confirm and report cause of fault according to workplace procedures 2.4 Develop and report recommendations for necessary repairs according to workplace procedures
3. Repair marine inboard propeller drive system	3.1 Identify required information for repair activity 3.2 Identify tools, equipment and materials required for repair activity and establish serviceability according to workplace procedures 3.3 Carry out repairs according to workplace and manufacturer procedures, manufacturer specifications, workplace health and safety and environmental requirements 3.4 Carry out post-repair testing according to workplace procedures, workplace health and safety and environmental requirements
4. Complete work processes	4.1 Conduct final inspection according to workplace procedures and confirm vehicle is ready for use 4.2 Clear work area and dispose of or recycle materials according to workplace procedures 4.3 Complete documentation according to workplace procedures

Foundation Skills

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

SKILL	DESCRIPTION
Learning	• Locates required sources of information efficiently • Develops a sequenced plan for a specific task.
Reading	• Organises and interprets technical information from workplace procedures, manufacturer procedures and manufacturer specifications.
Oral communication	• Clarifies instructions • Obtains information from customers and supervisors.

SKILL	DESCRIPTION
Numeracy	• Measures inboard propeller drive system components • Uses mathematical operations • Calculates deviations and tolerances from manufacturer specifications.
Planning and organising	• Plans own work requirements • Prioritises actions to achieve required outcomes • Ensures tasks are completed within workplace timeframes.
Technology	• Uses precision measuring equipment.

Unit Mapping Information

Supersedes and is equivalent to AURRTQ004 Diagnose and repair marine inboard propeller drive systems.

Links

Companion Volume Implementation Guide is found on VETNet -

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

Assessment Requirements for AURRTQ104 Diagnose and repair marine inboard propeller drive systems

Modification History

Release	Comments
Release 1	This version first released with AUR Automotive Retail, Service and Repair Training Package Version 6.0

Performance Evidence

The candidate must demonstrate the ability to complete the tasks outlined in the elements, performance criteria and foundation skills of this unit, including evidence of the ability to:

- diagnose and repair a fault in three different marine inboard propeller drive systems, including repairs to at least two of the following:
 - direct drive
 - V-drive
 - drop-centre.

Knowledge Evidence

The candidate must be able to demonstrate knowledge to complete the tasks outlined in the elements, performance criteria and foundation skills of this unit, including knowledge of:

- methods to locate and interpret information required to diagnose and repair marine inboard propeller drive systems including:
 - information provided by customers and supervisors
 - manufacturer specifications and procedures or equivalent documentation
- workplace procedures required to diagnose and repair marine inboard propeller drive systems including:
 - establishing serviceability of tools and equipment
 - documentation procedures
 - housekeeping procedures including:
 - examination of tools and equipment
 - storage of equipment
 - identification, tagging and isolation of faulty equipment
 - disposal of excess materials
 - recycling procedures

- workplace health and safety (WHS) requirements relating to diagnosing and repairing marine inboard propeller drive systems, including procedures for working with rotating shafts
- environmental requirements relating to diagnosing and repairing marine inboard propeller drive systems
- 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 marine 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 marine 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 marine inboard propeller drive systems, including water testing.

Assessment Conditions

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.

Assessors of this unit must satisfy the requirements for assessors in applicable vocational education and training legislation, frameworks and/or standards.

Links

Companion Volume Implementation Guide is found on VETNet -

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

