



Australian Government

AURRTQ106 Diagnose and repair marine jet drive propulsion systems

Release: 1

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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 faults in the jet drive propulsion 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 jet drive propulsion 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 jet drive propulsion 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. Dismantle marine jet drive propulsion system	3.1 Identify tools and equipment required to dismantle engine and establish serviceability according to workplace procedures 3.2 Dismantle propulsion system, clean and inspect components according to workplace procedures, workplace health and safety and environmental requirements 3.3 Measure and compare components against manufacturer specifications 3.4 Confirm recommendations for necessary repairs according to workplace procedures
4. Repair and re-assemble marine jet drive propulsion system	4.1 Identify required information for repair activity 4.2 Identify tools, equipment and materials required for repair activity and establish serviceability according to workplace procedures 4.3 Carry out repairs according to workplace and manufacturer procedures, manufacturer specifications, workplace health and safety and environmental requirements 4.4 Re-assemble propulsion system according to workplace and manufacturer procedures, manufacturer specifications, workplace health and safety and environmental requirements 4.5 Carry out post-repair testing according to workplace procedures, workplace health and safety and environmental requirements
5. Complete work processes	5.1 Conduct final inspection according to workplace procedures and confirm vehicle is ready for use 5.2 Clear work area and dispose of or recycle materials according to workplace procedures 5.3 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.
Numeracy	• Measures jet drive propulsion system components • Uses mathematical operations • Calculates distances, areas, volumes and tolerances • Calculates deviations 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 AURRTQ006 Diagnose and repair marine jet drive propulsion 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 AURRTQ106 Diagnose and repair marine jet drive propulsion systems

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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 the following two jet drive propulsion systems in different marine vessels:
 - centrifugal
 - axial flow.

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 jet drive propulsion systems including:
 - information provided by customers and supervisors
 - manufacturer specifications and procedures or equivalent documentation
- workplace procedures required to diagnose and repair marine jet drive propulsion 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 jet drive propulsion systems, including procedures for lifting and supporting jet drive propulsion systems

- environmental requirements relating to diagnosing and repairing marine jet drive propulsion systems, including procedures for trapping, storing and disposing of fluids released from jet drive propulsion systems
- operating principles of jet drive propulsion systems and associated components, including:
 - producing thrust using water pressure
 - changing vessel direction
- purpose and operation of jet drive propulsion systems and components, including:
 - types of jet pumps, including:
 - centrifugal
 - axial flow
 - methods of reversing thrust, including:
 - cable-operated buckets
 - hydraulically-operated buckets
 - electrically-operated buckets
 - gearboxes
- diagnostic testing procedures for marine jet drive propulsion systems, including:
 - housing to impeller clearance and wear
 - bearing wear
 - seal wear
 - bilge pump operation
 - gearbox operation
 - bucket operation
- dismantling procedures for jet drive propulsion systems, including procedures for:
 - measuring clearances and tolerances
 - inspecting components
- repair procedures for marine jet drive propulsion systems, including procedures for:
 - replacing impellers and housing
 - replacing bearings and seals, including oil replacement
 - replacing couplings
 - servicing buckets
- post-repair testing procedures for marine jet drive propulsion 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 jet drive propulsion 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 jet drive propulsion system specifications
- a centrifugal jet drive propulsion system in a marine vessel with system faults
- an axial flow jet drive propulsion system in a marine vessel with system faults
- diagnostic equipment for jet drive propulsion systems
- tools, equipment and materials appropriate for dismantling, repairing, reassembling and adjusting marine jet drive propulsion systems.

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

Links

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