



Australian Government

MARB006 Maintain marine internal combustion engines, propulsion plant and auxiliary systems

Release: 2

MARB006 Maintain marine internal combustion engines, propulsion plant and auxiliary systems

Modification History

Release 2. In Performance Criteria 1.6 removed as it duplicated 1.1. Mapping information has been corrected.

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to complete basic maintenance of marine internal combustion engines, propulsion plant and auxiliary systems.

This unit applies to engine workers in the maritime industry working as a Marine Engine Driver Grade 2 Near Coastal on vessels up to 750 kW.

This unit has links to legislative and certification requirements.

Pre-requisite Unit

Not applicable.

Competency Field

B – Equipment Checking and Maintenance

Unit Sector

Not applicable.

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

1 Plan maintenance activities

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| 1.1 | Maintenance plan is accessed to determine maintenance requirements for engines, propulsion plant and auxiliary systems |
| 1.2 | Inspections are conducted and additional non-routine maintenance requirements are determined |
| 1.3 | Manufacturer specifications for machinery and equipment are obtained |
| 1.4 | Tasks are planned and sequenced in conjunction with others |

		involved in or affected by maintenance work
	1.5	Consumables and equipment are selected and checked for serviceability
2 Complete preventative maintenance	2.1	Machinery and equipment is safely isolated according to work health and safety/occupational health and safety (WHS/OHS) requirements and organisational practices
	2.2	WHS/OHS risk control measures and procedures for carrying out work are followed
	2.3	Work area is prepared
	2.4	Preventative maintenance is carried out in compliance with technical specifications
	2.5	Methods for dealing with unexpected situations are selected on the basis of safety and specified work outcomes
	2.6	Maintenance work is checked to verify that it conforms to technical specifications and complies with survey requirements where applicable
3 Complete breakdown maintenance	3.1	Nature of breakdown is confirmed using maintenance records and/or logbook entries related to reported breakdown
	3.2	Restrictions are applied to operations, where necessary, and Master is informed
	3.3	Machinery and equipment is safely isolated according to WHS/OHS requirements and organisational practices
	3.4	Repair work is carried out according to technical specifications
	3.5	Master is notified of completion of repair work and details are documented
4 Complete hull maintenance	4.1	Checks of vessel hull, equipment and fittings are carried out according to maintenance schedules, survey requirements and vessel manufacturer instructions
	4.2	Deterioration in vessel structure, equipment and fittings is identified
	4.3	Checks on propeller, stern tube and rudder are carried out in accordance with organisational procedures, safety regulations and survey requirements

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| | 4.4 | WHS/OHS risk control measures and procedures for carrying out work are followed |
| | 4.5 | Work area is prepared |
| | 4.6 | Maintenance work is checked to verify it conforms to technical specifications and complies with survey requirements where applicable |
| 5 Clean up and complete documentation | 5.1 | Work area is cleared and cleaned |
| | 5.2 | Materials are disposed of or recycled according to legislative and workplace requirements |
| | 5.3 | Tools and equipment are cleaned, checked and stored according to workplace procedures |
| | 5.4 | Machinery and equipment is returned to service and monitored for correct operation according to organisational practices |
| | 5.5 | Maintenance report is completed according to workplace procedures |
| | 5.6 | Work area is cleared and cleaned |

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

- Maintenance requirements include one or more of the following:
- cleaning:
 - filters
 - coolers
 - greasing
 - maintaining emergency equipment
 - oiling
 - oily water separator

	• overhauling and repairing pumps • scheduled survey inspections • topping up oils
Engines, propulsion plant and auxiliary systems include one or more of the following:	• auxiliary equipment and associated spaces • cooling systems • deck machinery • fixed firefighting systems • fuel systems • gearbox • hull fittings • lubricating systems • marine two- and four-stroke: • diesel engines • petrol engines • propeller and immediate shafting alignment • pumping systems • refrigeration systems • steering systems • sterndrive and water jet drive units
Consumables and equipment include one or more of the following:	• cleaning chemicals • coolants • hand and power tools • oils and grease • refrigerant gas • replacement parts • test equipment
Nature of breakdown includes one or more of the following:	• cooling water system failure • engine failure • exhaust systems • fuel system failure • gearbox failure • lubricating systems failure • power plant failure • propeller and shafting arrangements • pumping systems failure • refrigeration plant failure • steering gear failure
Checks of vessel hull, equipment and fittings include one or more of the following:	• anodes • intake grates • keel coolers • ship side valves

- watertight hatches and openings

Materials include one or more of the following:

- rags
- spent oil

Unit Mapping Information

This unit replaces and is equivalent to MARB3006A Maintain marine internal combustion engines, propulsion plant and auxiliary systems.

MARB3006A replaces and is equivalent to TDMMB290B Recognise and correct deteriorated fittings and machinery.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>

Assessment Requirements for MARB006 Maintain marine internal combustion engines, propulsion plant and auxiliary systems

Modification History

Release 2. Clarification of guidance information in Performance Evidence, Knowledge Evidence and Assessment Conditions.

Release 1. New unit of competency.

Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements, performance criteria and range of conditions on at least one occasion and include:

- applying safety requirements throughout the work sequence including the use of personal protective equipment (PPE)
- completing:
 - all work to specification
 - basic user maintenance of marine internal combustion engine, propulsion plant and auxiliary systems to manufacturer specifications and survey requirements, so as to prevent pollution of the marine environment
- maintenance records
- developing effective planning documents
- implementing safe and environmentally responsible work practices
- planning maintenance activities according to technical, legislative, safety and procedural specifications
- reading and interpreting manufacturer specifications and safety data sheets (SDS)/material safety data sheets (MSDS).

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements, performance criteria and range of conditions and include knowledge of:

- basic hydraulic systems and user maintenance requirements
- basic vessel construction
- bearing types, materials, installation and lubrication
- common faults in:
 - steering gear
 - refrigeration systems
- construction and maintenance of heat exchangers

- correct pressure and flow conditions
- corrosion prevention
- coupling types, fitting, keys and keyways
- cross connections between:
 - sea water systems and bilge systems
 - bilge/ballast/seawater systems and fire main
- dangers associated with:
 - back-flooding and methods to prevent back-flooding
 - liquefied petroleum gas (LPG) and petrol vapours
- dangers of refrigerant gas leaks in confined spaces
- diesel engine:
 - construction
 - fuel injection, timing and control equipment
 - routine maintenance
- engine:
 - fault finding techniques
 - performance and reasons for lack of performance
 - protection arrangements
- electro-hydraulic steering gear
- emergency steering systems
- faults that can occur with firefighting equipment and systems
- fire main system and components including pumps, hoses and nozzles
- fixed firefighting systems and associated remote shut-offs and closing of appliances
- heat exchanger, keel cooler and raw water cooling systems
- glands, packing and seals
- maintenance of watertight openings and hull fittings
- marine gearbox faults and emergency operation
- method of propulsion reversal including controllable pitch propeller construction
- oil:
 - filter changing procedures
 - quality monitoring
- planned maintenance
- propeller types, fitting, keys and keyways, securing nuts , locking
- pump capabilities and requirements for priming
- refrigeration systems and components
- relevant regulations and codes of practice relating to the maintenance of engineering equipment and systems such as firefighting
- routine maintenance:
 - on steering systems
 - of refrigeration systems
- rudder and stock bearing supports

- rudder construction and rudder types
- seawater circulating systems
- shutting down machinery
- statutory and organisational requirements for documentation relating to the maintenance of engineering equipment and systems such as firefighting
- storage of LPG cylinders
- testing of LPG detectors
- tiller arm attachment
- types of:
 - deck machinery
 - pumps and safety devices
- wet sump lubrication systems.

Assessment Conditions

Assessors must satisfy National Vocational Education and Training Regulator (NVR)/Australian Quality Training Framework (AQTF) assessor requirements.

Assessment must satisfy the National Vocational Education and Training Regulator (NVR)/Australian Quality Training Framework (AQTF) standards.

Assessment must occur in workplace operational situations where it is appropriate to do so; where this is not appropriate, assessment must occur in simulated workplace operational situations that reflect workplace conditions.

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Resources for assessment must include access to:

- tools, equipment, machinery, materials and personal protective equipment currently used in industry
- applicable documentation such as legislation, regulations, codes of practice, workplace procedures and operational manuals
- range of relevant exercises, case studies and/or simulations.

Links

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<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>