



Australian Government

MARB2002A Service marine internal combustion engines and propulsion and auxiliary systems

Release 1

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Modification History

Release 1

This is the first release of this unit.

Unit Descriptor

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

Application of the Unit

This unit applies to deck workers working in the maritime industry on vessels up to 12 metres.

Licensing/Regulatory Information

Not applicable.

Pre-Requisites

Not applicable.

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.

Performance criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the evidence guide.

Elements and Performance Criteria

- | | |
|---|---|
| 1 Prepare for work | <ul style="list-style-type: none">1.1 Planned maintenance program is accessed to determine servicing requirements1.2 Inspections are conducted and additional non-routine servicing requirements are determined1.3 Manufacturer specifications for equipment are obtained1.4 Tasks are planned and sequenced in conjunction with others involved in or affected by servicing work1.5 Equipment is safely isolated according to regulations and work health and safety (WHS)/occupational health and safety (OHS) requirements1.6 Tools and equipment are selected and checked for serviceability1.7 Work area is prepared |
| 2 Carry out routine service | <ul style="list-style-type: none">2.1 Equipment is inspected throughout servicing and inspection results are compared with manufacturer specifications2.2 Servicing tasks are carried out to specification2.3 Mechanical equipment and system components are checked with appropriate instruments2.4 Unserviceable equipment is tagged according to workplace procedures and appropriate personnel are notified |
| 3 Repair and replace faulty components | <ul style="list-style-type: none">3.1 Faulty items or components are removed using appropriate tools and equipment according to workplace procedures3.2 Replaceable items are selected or serviceable items are fitted according to manufacturer specifications3.3 Adjustments are made to equipment or components to ensure compliance with specifications3.4 Operational check is carried out on system to ensure compliance with manufacturer specifications |
| 4 Clean up and complete documentation | <ul style="list-style-type: none">4.1 Work area is cleared and cleaned4.2 Materials are disposed of or recycled according to legislative and workplace requirements4.3 Tools and equipment are cleaned, checked and stored according to workplace procedures |

4.4 Maintenance report is completed according to workplace procedures

Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required Skills:

- Implement safe and environmentally responsible work practices
- Read and interpret:
 - manufacturer specifications
 - safety data sheets (SDS)/material safety data sheets (MSDS)

Required Knowledge:

- Basic combustion process
- Basic electronic control unit and governor maintenance
- Basic reverse/reduction gearbox maintenance
- Basic timing diagrams
- Circulating pumps and maintenance
- Controllable pitch propellers maintenance
- Cooling systems and cooling system maintenance
- Couplings types, fittings, keys and keyways, securing nuts, locking
- Environmental responsibilities, regulations and legislative requirements
- Fuel systems and fuel system maintenance
- Intake system and system maintenance
- Instrumentation maintenance
- Intermediate bearing maintenance
- Lube oil:
 - system and system maintenance
 - contamination
- Lubricating systems and systems maintenance
- Maintenance of:
 - drive systems, belts, clutches, motors
 - hydraulic systems
 - pumping systems
 - refrigeration systems
 - sea water piping including corrosion control
 - shaft seals and rudder stock, glands and packings
 - steering systems
- Marine two- and four- stroke:
 - diesel engines

- petrol engines
- Principles and procedures of lubrication
- Propeller and intermediate shafting alignment
- Routine servicing of:
 - firefighting equipment in engine space
 - valves
- Sterndrive and water jet drive units maintenance
- Types, characteristics and functions of equipment/tools used in maintenance
- WHS/OHS requirements and work practices

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, the required skills and knowledge, the range statement and the Assessment Guidelines for the Training Package.

Critical aspects for assessment and evidence required to demonstrate competency in this unit

The evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the Elements, Performance Criteria, Required Skills, Required Knowledge and include:

- being aware of own ability and limits to rectify irregularities and faults
- implementing workplace environmental and waste management procedures correctly.

Context of and specific resources for assessment

Performance is demonstrated consistently over time and in a suitable range of contexts.

Resources for assessment include access to:

- industry-approved marine operations site where servicing marine internal combustion engines, and propulsion and auxiliary systems can be conducted
- tools, equipment and personal protective equipment currently used in industry
- relevant regulatory and equipment documentation that impacts on work activities
- range of relevant exercises, case studies and/or other simulated practical and knowledge assessments
- appropriate range of relevant operational situations in the workplace.

In both real and simulated environments, access is required to:

- relevant and appropriate materials and equipment
- applicable documentation including workplace procedures, regulations, codes of practice and operation manuals.

Method of assessment

Practical assessment must occur in an:

- appropriately simulated workplace environment and/or
- appropriate range of situations in the workplace.

A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate to this unit:

- direct observation of the candidate servicing marine internal combustion engines, and propulsion and auxiliary systems
- direct observation of the candidate applying relevant

WHS/OHS requirements and work practices.

Guidance information for assessment

Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

In all cases where practical assessment is used it should be combined with targeted questioning to assess Required Knowledge.

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

Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below.

- Equipment may include:
- Auxiliary equipment and associated spaces
 - Cooling systems
 - Firefighting equipment
 - Fuel systems
 - Gearbox
 - Lubricating systems
 - Marine two- and four-stroke:
 - diesel engines
 - petrol engines
 - Propeller and immediate shafting alignment
 - Pumping systems
 - Refrigeration systems
 - Sterndrive and water jet drive units
 - Steering systems
- Tools and equipment may include:
- Hand and power tools
 - Specialised tools
 - Test equipment
- Servicing tasks may include:
- Cleaning:
 - coolers
 - filters
 - Greasing
 - Oiling
 - Replacing:
 - anodes
 - shaft seals and gland packing
 - belt drives
 - pumps
 - Topping up oils
- Materials may include:
- Cleaning products
 - Rags
 - Refrigerant gas
 - Spent oil
 - Used components

Unit Sector(s)

Not applicable.

Competency Field

Equipment Checking and Maintenance