



Australian Government

MARB016 Contribute to routine engine maintenance on a vessel

Release: 1

MARB016 Contribute to routine engine maintenance on a vessel

Modification History

Release 1. New unit of competency.

Application

This unit involves the skills and knowledge required to contribute to servicing engines and engine components on a vessel.

This unit applies to an Integrated Rating or Able Seafarer-Engine, who assists under the direction of the officer in charge of the engineering watch, in performing a range of engine maintenance activities on a range of vessels.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Pre-requisite Unit

Not applicable.

Competency Field

B – Equipment Checking and Maintenance

Unit Sector

Not applicable.

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1 Plan engine maintenance tasks

PERFORMANCE CRITERIA

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

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|-----|---|
| 1.1 | Planned maintenance system is accessed to establish engine maintenance requirements for vessel |
| 1.2 | Maintenance tasks are proposed and prioritised in conjunction with others involved in or affected by the maintenance work |
| 1.3 | Resource requirements are identified and accessed to ensure |

		efficient completion of tasks
	1.4	Maintenance tasks are recorded in the maintenance schedule according to organisational procedures
2 Prepare for engine service	2.1	Nature and scope of work requirements are confirmed according to organisational procedures
	2.2	Service procedures, workshop manuals and manufacturer specifications are accessed and interpreted
	2.3	Tools, equipment and materials required for servicing are identified and prepared
	2.4	Engine and components are visually inspected for external signs of defects according to maintenance documentation
	2.5	Electrical components are identified and electrical equipment is used safely
	2.6	Engine is started, ran up to operating temperature and checked for leaks, abnormal noises and pressures
	2.7	Test results are compared with manufacturer/component supplier specifications to determine compliance or non-compliance
	2.8	Results are documented with supporting information and recommendations are made about serviceability and repair
3 Service engines and engine components	3.1	Work health and safety (WHS)/occupational health and safety (OHS) requirements are identified and observed
	3.2	Service operations are performed according to organisational procedures manufacturer/component supplier specifications
	3.3	Fluid level checks and replenishments are carried out according to manufacturer/component supplier specifications
	3.4	Appropriate lubricants are applied to engine
	3.5	Equipment/components requiring replacement are changed according to manufacturer/component supplier specifications
	3.6	Adjustments are made according to manufacturer/component supplier specifications
4 Complete work	4.1	Engine is inspected to ensure protective guards, cowlings and safety features are in place

- 4.2 Engine is cleaned according to organisational procedures
- 4.3 Materials to be reused are collected and stored according to manufacturer specifications and organisational procedures
- 4.4 Tools and equipment are cleaned, maintained and stored according to manufacturer specifications and organisational procedures
- 4.5 Waste and scrap are removed according to legislative requirements and organisational procedures
- 4.6 Unserviceable equipment is tagged and faults are identified and reported according to organisational procedures

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.

Non-essential conditions can be found in the Companion Volume Implementation Guide.

- Maintenance tasks include one or more of the following:
- economiser cleaning
 - engine room rounds (daily/weekly/monthly maintenance checks)
 - greasing and oiling of machinery
 - inspection and maintenance of:
 - hatches, watertight doors ports and deadlights
 - hoists and lifting equipment
 - routine inspection of hand and power tools, measuring instruments and machinery tools
 - safe disposal of waste materials
 - scavenge space cleaning
 - soot blowing
 - surface preparation and painting

Unit Mapping Information

This unit replaces and is equivalent to MARB3002A Perform routine engine maintenance on a vessel.

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 MARB016 Contribute to routine engine maintenance on a vessel

Modification History

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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 relevant work health and safety (WHS)/occupational health and safety (OHS) requirements and work practices
- assisting in maintaining and servicing marine:
 - cooling systems/components
 - batteries
 - engine mounting systems/components
 - exhaust systems/components
 - fuel systems/components
 - intake systems/components
 - lubrication systems/components
- communicating with other personnel using effective:
 - listening techniques
 - questioning to confirm understanding
 - verbal and non-verbal language
- confirming maintenance to be undertaken and identifying resource requirements with the officer in charge of the engineering watch
- ensuring behaviour reflects relevant current legislative and regulatory requirements
- ensuring currency of relevant WHS/OHS skills and knowledge
- identifying hazards and safety issues and reporting these to the engineering officer of the watch
- identifying tools, equipment and materials required to undertake maintenance tasks
- using electrical equipment safely and applying:
 - correct emergency procedures
 - different voltages in use on board
 - isolation procedures
 - precautions to prevent electric shock
 - safety precautions before commencing work
- using painting, lubrication and cleaning materials, and equipment safely.

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 electrical principles covering voltage, current, resistance, power, magnetic and inductance
- basic mechanical principles covering the concepts of mechanical, hydraulic and pneumatic systems
- causes of electric shock and precautions to be observed to prevent shock
- engine room cleaning procedure and relevant cleaning agents
- engine room hazards and safety including:
 - electrical safety
 - gas testing
 - head of water/fluid
 - heat stress
 - high pressures
 - hot fluids
 - mechanical safety
 - noise
 - pollution
 - steam
 - toxic gases
 - ventilation
 - vibration
- engine room machinery and equipment including:
 - air compressors
 - air start systems
 - bilge system, bilge pumps, bilge pick ups, bilge valves, bilge piping
 - engine protection devices (crankcase mist detectors)
 - hydraulic systems, power packs, rams and motors, directional control valves (DCVs)
 - oily water separators
 - pumps – positive displacement, centrifugal, axial flow
 - purifiers and clarifiers
 - refrigeration and air-conditioning plant
 - sewage treatment plant
 - slow speed, medium speed and high speed diesels
 - steering systems

- osmosis plant
- valves – globe and full flow, screw down non return, screw lift, butterfly, ball, relief, non-return, gate
- water making (both fresh water generators and reverse)
- manufacturer safety guidelines and shipboard instructions
- purpose of isolation procedures and application of lock out tags
- rights and responsibilities of individuals about lock out and tagging of plant and equipment
- relevant WHS/OHS requirements, work practices and pollution control regulations and policies
- routine maintenance and repair procedures
- safe disposal of waste materials
- surface preparation techniques, including:
 - abrasive blast cleaning
 - flame cleaning
 - hand and power tool cleaning
- types, functions and limitations of marine:
 - cooling systems/components
 - engines
 - engine mounting systems/components
 - exhaust systems/components
 - fuel systems/components
 - intake systems/components
 - lubrication systems/components.

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the *Standards for Registered Training Organisations* current at the time of assessment.

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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.

Practical assessment must occur in a workplace operational situation where routine maintenance can be undertaken on a range of marine engines. Where this is not available, in a simulated workplace operational situation that replicates workplace conditions.

Resources for assessment include access to:

- relevant documentation including workplace procedures, regulations, codes of practice and

operation manuals

- tools, equipment, materials that replicate and are currently used in industry, including:
 - cleaning agents and equipment
 - hand tools
 - machine tools
 - measuring instruments
 - power tools
 - suitable marine engine and relevant components
 - relevant engine room machinery and equipment
 - relevant diagnostic equipment
- personal protective equipment currently used in industry.

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