

Overview

This standard identifies the competences you need to reassemble and refit marine mechanical equipment following the completion of overhauling activities. This will involve reassembling and refitting equipment at component or unit level on a variety of different types of marine mechanical assemblies and sub-assemblies, such as propulsion and transmission, fluid power, steering and control, lifting equipment, refrigeration and air conditioning, fire main equipment and pantry and galley equipment.

Your responsibilities will require you to comply with organisational policy and procedures for the reassembling and refitting of the marine mechanical equipment and to report any problems with the activities that you cannot personally resolve, or are outside your permitted authority, to the relevant people. You must ensure that all tools, equipment and materials used in the activities are removed from the work area on completion of the activities and that all necessary job/task documentation is completed accurately and legibly. You will be expected to work with a minimum of supervision, taking personal responsibility for your actions and for the quality and accuracy of the work that you carry out.

Your underpinning knowledge will provide a good understanding of your work and will provide an informed approach to applying reassembling and refitting techniques on marine mechanical equipment. You will understand the reassembling and refitting methods and procedures used and their application. You will know about the mechanical equipment being refitted, in adequate depth to provide a sound basis for carrying out the reassembling and refitting activities to the required specification.

You will understand the safety precautions required when carrying out the reassembling and refitting activities, especially those for connecting the equipment. You will be required to demonstrate safe working practices throughout and will understand your responsibility for taking the necessary safeguards to protect yourself and others in the workplace, both ashore and afloat.

Performance criteria

You must be able to:

1. work safely at all times, complying with health and safety and other relevant regulations, directives and guidelines
2. follow all relevant drawings and specifications for the activity being carried out
3. use the correct tools and equipment for the reassembling and refitting operations and check that they are in a safe and usable condition
4. reassemble, refit, position and secure the equipment and components in accordance with the specification
5. ensure that all necessary connections to the equipment are complete
6. deal promptly and effectively with problems within your control and report those that cannot be solved
7. check that the installation is complete and that all components are free from damage
8. complete relevant documentation in line with organisational procedures

Knowledge and understanding

You need to know and understand:

1. the specific safety practices and procedures that you need to observe when reassembling and refitting marine mechanical equipment (including any specific legislation, regulations/codes of practice for the activities, equipment or materials)
2. the health and safety requirements of the area in which the marine mechanical reassembling activity is to take place and the responsibility these requirements place on you
3. how to recognise and deal with emergencies and the procedures to be followed (such as methods of safely evacuating and closing down of compartments in the case of fire or other major incident, first aid, fire fighting and resuscitation of personnel)
4. the procedures to be carried out before starting work on the equipment (such as obtaining permits to work, obtaining and complying with risk assessments and other health and safety requirements)
5. the hazards associated with reassembling and refitting marine mechanical equipment and with the tools and equipment used and how they can be minimised
6. the importance of wearing protective clothing and other appropriate safety equipment (PPE) during the mechanical reassembling activities
7. how to obtain and interpret drawings, circuit and physical layouts, charts, specifications, manufacturers' manuals, history/maintenance reports and other documents needed in the reassembly process
8. how to carry out currency/issue checks of the specifications you are working with
9. the mechanical equipment to be reassembled/refitted and its function within the vessel
10. the techniques used to reassemble the mechanical equipment (such as making electrical connections, aligning components, refitting assemblies requiring pressure/force, refitting mechanical locking and securing mechanisms/devices)
11. methods of refitting assemblies and sub-assemblies without causing damage to surrounding structures
12. methods of supporting and lifting the equipment being refitted
13. the need to ensure that lifting and handling equipment is within its current test dates

14. the tools and equipment used in the activities and how to check that they are in a safe, tested and usable condition
15. the various mechanical fasteners that will be used and their method of installation (such as keys, keyways, threaded fasteners, special securing devices)
16. the use of seals, sealants and adhesives and the precautions to be taken
17. the importance of using the specified fasteners for the particular equipment and why you must not substitute others
18.
why securing devices need to be locked and the different methods that are used
19.
the torque loading requirements on the fasteners and what to do if these loadings are exceeded or not achieved
20. the quality control procedures to be followed during the reassembling and refitting operations
21. procedures for ensuring that you have the correct tools, equipment, components and fasteners for the activities
22. the techniques used to position, align, adjust, and secure the equipment to the vessel without damage
23. the procedure for the safe disposal of waste materials
24. how to conduct any necessary checks to ensure the equipment's integrity, functionality, accuracy and quality of the installation
25. how to recognise installation defects (such as poor seals, misalignment, ineffective fasteners or contamination)
26. the importance of ensuring that the refitted equipment is free from foreign object debris and that any exposed components or pipe ends are correctly covered/protected
27. the tools and equipment used in the activities and their calibration/care and control procedures
28. why tool/equipment control is critical
29. the generation of documentation and/or reports following the reassembling and refitting activity
30. the problems that can occur during the reassembling and refitting activity and how they can be overcome
31. the extent of your own authority and whom you should report to if you have a problem that you cannot resolve

Scope/range related to performance criteria

1.

Carry out all of the following during the reassembling and refitting of the marine mechanical equipment:

- 1.1 plan the reassembling and refitting activities to cause minimum disruption to normal working
- 1.2 use the correct issue of structure/vessel/craft system drawings and documentation
- 1.3 adhere to risk assessment, COSHH and other relevant safety standards
- 1.4 obtain clearance to work on the system and observe the appropriate power isolation and safety procedures
- 1.5 provide safe access and working arrangements for the maintenance area
- 1.6 carry out the reassembling and refitting activities using appropriate techniques and procedures
- 1.7 leave the work area in the prescribed category of cleanliness on completion of the activities

2.

Carry out assembling and refitting activities on three of the following types of marine mechanical equipment:

- 2.1 propulsion
- 2.2 auxiliary power units
- 2.3 weapons launchers
- 2.4 transmission
- 2.5 fire main equipment
- 2.6 liquid oxygen equipment
- 2.7 fuel
- 2.8 ballast arrangements
- 2.9 steam plant and equipment
- 2.10 hydraulic
- 2.11 compressors (high or low pressure)
- 2.12 pantry and galley equipment
- 2.13 pneumatic
- 2.14 weapons hoists
- 2.15 refrigeration and air conditioning
- 2.16 stern seals, stabilisers and shock mounts
- 2.17 control valves (such as throttle, isolating, reducing and ported)
- 2.18 pumps (such as centrifugal and positive displacement)
- 2.19 steering and rudder arrangements
- 2.20 processing plant (such as sewage treatment and reverse osmosis)
- 2.21 propeller shafts and drives (such as Z, V and inline, plummer blocks)
- 2.22 lifting and handling equipment (such as replenishment at sea rigs, aircraft lifts, davit, windlasses and capstans)

2.23 other specific marine mechanical equipment

3.

Carry out twelve of the following reassembly and refitting methods and techniques:

- 3.1 marking/setting out of locating and securing positions
- 3.2 preparing holes (such as drilling, cleaning out threads)
- 3.3 positioning equipment/components
- 3.4 levelling of equipment
- 3.5 aligning of equipment
- 3.6 assembly/connection of components or sub-assemblies
- 3.7 setting travel
- 3.8 setting timings
- 3.9 setting and adjusting working clearances
- 3.10 torque setting of mechanical fasteners
- 3.11 tensioning cables
- 3.12 making pipe connections
- 3.13 lubricating
- 3.14 replace fluids
- 3.15 lifting and handling
- 3.16 connecting wires and cables
- 3.17 securing by using mechanical fixings
- 3.18 securing by using adhesives
- 3.19 sealing
- 3.20 applying fastener locking devices
- 3.21 earth bonding
- 3.22 ensuring the equipment cleanliness (such as covering exposed pie ends or components)

4.

Use six of the following types of fasteners and securing devices:

- 4.1 swing bolts
- 4.2 screws
- 4.3 dowels
- 4.4 quick release fasteners
- 4.5 studs with nuts
- 4.6 wing nuts
- 4.7 bolts
- 4.8 flexible bellows
- 4.9 locking devices (such as split, parallel, clevis or taper pins)
- 4.10 keys/keyways (such as slotted, semi-circular, woodruff, taper)

5.

Reassemble and refit marine mechanical equipment which complies with one of the following standards:

- 5.1 BS or ISO standards and procedures
- 5.2 customer (contractual) standards and requirements
- 5.3 company standards and procedures
- 5.4 specific equipment requirements/manufacturer's data

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5.5 recognised compliance agency/body's standards

5.6 other accepted international standards

6.

Complete the relevant documentation in line with

organisational procedures, to include one of the following and pass it to the appropriate people:

6.1 job cards

6.2 system log

6.3 maintenance logs or reports

6.4 installation records

6.5 work acceptance documentation

6.6 other specific reporting method

Behaviours

Behaviours:

You will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as:

- strong work ethic
- positive attitude
- team player
- dependability
- responsibility
- honesty
- integrity
- motivation
- commitment

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Reassembling and refitting marine mechanical equipment

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