



Australian Government

MARB052 Apply knowledge of the principles of magnetic compass adjusting

Release: 1

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Modification History

Release 1. This is the first release of this unit of competency in the MAR Maritime Training Package.

Application

This unit involves the skills and knowledge required to apply knowledge of the principles of magnetic compass adjusting.

This unit includes explaining principles, of magnets, magnetism and magnetic fields, terrestrial magnetism, ship's magnetism and principles of magnetic compass design and construction.

This unit applies to people working in the maritime industry in the capacity of:

- Compass Adjuster for vessels less than or equal to 45 metres in length.

Work is performed under limited supervision and applies to those responsible for adjusting a magnetic compass in the work environment and who are responsible for their own work.

Licensing/Regulatory Information

This unit is one of the requirements to obtain certification as a Compass Adjuster as defined in Marine Order 27.

To undertake this unit of competency a person must hold at least a:

- certificate of competency that permits a person to command a vessel less than 24 metres (Masters < 24 m Near Coastal (NC)) or an equivalent certificate as a Master recognised by Australian Maritime Safety Authority (AMSA), or
- a current compass adjuster licence issued by a state or territory or AMSA for those vessels.

Pre-requisite Unit

Not applicable

Competency Field

B - Equipment Checking and Maintenance

Unit Sector

Maritime Sector

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1 Explain principles of magnets, magnetism and magnetic fields

2 Explain terrestrial magnetism

PERFORMANCE CRITERIA

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

- 1.1 Laws of magnetism are explained
- 1.2 Properties of magnets are described
- 1.3 Principles of magnetic fields, magnetism and magnets are explained
- 1.4 Effects of magnets on a magnetic compass needle under varying conditions are described
- 1.5 Disturbing and restoring forces and position of equilibrium is explained
- 1.6 Molecular theory of magnetism is explained
- 1.7 Magnetic effects of electrical currents are described
- 2.1 Principles of terrestrial magnetism are described
- 2.2 Magnetic variation is defined, and explanation given as to why it varies depending on location on the earth, time of day and effects of the sun and moon
- 2.3 Method to determine magnetic variation at a location is described
- 2.4 Angle of magnetic dip is described
- 2.5 The earth's total force (T), horizontal force (H) and vertical force (Z) are explained
- 2.6 Local magnetic anomaly is described
- 2.7 Terrestrial magnetism and varying strengths in different parts of the world and the effects on deviation are

- explained
- 3 Explain ship's magnetism**
- 3.1** Effects of the ship's permanent and induced magnetism is described
- 3.2** Forces P, Q and R with the ship upright are described
- 3.3** Induced magnetism in soft iron rods a, b, c, d, e, f, g, h and k are described
- 3.4** Temporary permanent magnetism and its effects at sea are outlined
- 3.5** Causes and effects of Gaussin error are described
- 3.6** Effects of permanent and induced magnetism on directive force are explained
- 3.7** Lambda (λ) and mu (μ) are explained
- 4 Explain principles of magnetic compass design and construction**
- 4.1** Size and relative position of magnetic compass needles are identified
- 4.2** Location of soft iron correctors and permanent magnets with reference to each other and the compass needles are identified and the effect that each corrector has on the other correctors are described
- 4.3** Relative position of lubber mark/line, card, pivot and gimbals axes are identified
- 4.4** Types of correctors used in ships are described and their advantages and disadvantages are outlined
- 4.5** Effects of placing compasses in close proximity to magnetic material, electrical devices and other disturbing influences are described
- 4.6** Components of a magnetic compass are identified

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 may be found in the MAR training Package Companion Volume Implementation Guide.

Unit Mapping Information

This is a new unit. No equivalent unit.

Links

Companion Volume Implementation Guides are found in VETNet -
<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=772efb7b-4cce-47fe-9bbd-ee3b1d1eb4c2>