<table>
<thead>
<tr>
<th>Training Package</th>
<th>Metal and Engineering (MEM05)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Title</strong></td>
<td><strong>Classify recreational boating technologies and features</strong></td>
</tr>
<tr>
<td><strong>Unit code</strong></td>
<td>MEM50001B</td>
</tr>
<tr>
<td><strong>Competency field</strong></td>
<td>Boating services</td>
</tr>
<tr>
<td><strong>Band</strong></td>
<td>E</td>
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<tr>
<td><strong>Unit weight</strong></td>
<td>0</td>
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<tr>
<td><strong>HSC Indicative Hours</strong></td>
<td>20</td>
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</table>

**Unit descriptor**
This unit covers recognising vessel features, fittings and fixtures; correctly identifying power and transmission systems; describing system operating purpose; and using appropriate terminology.

**Prerequisites**
None

**Application of the competency**
This unit applies to the identification of vessel types and to the classification of vessels according to their main features. It relates to recreational vessels and covers engine and sail powered as well as rowed vessels.
The depth of knowledge required is sufficient to be able to identify one vessel from another and to be able to describe its method of propulsion where applicable.
Detailed features of hulls, power plants, trailers etc. are covered by other competencies.
All work and work practices are undertaken to regulatory and legislative requirements.

**Related units**
None

**Evidence Guide**
The evidence guide specifies the evidence required to demonstrate achievement in the unit of competency as a whole. It must be read in conjunction with the unit descriptor, performance criteria, range statement and the assessment guidelines for the Metal and Engineering Training Package.

<table>
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<tr>
<th>Overview of assessment requirements</th>
<th>Context of assessment</th>
<th>Interdependent assessment</th>
<th>Method of assessment</th>
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<tr>
<td>A person who demonstrates competency in this unit must be able to classify recreational boating technologies and features through the recognition of vessel features/fittings/fixtures, the correct identification of power and transmission systems, and be able to describe system operating purposes and use appropriate terminology.</td>
<td>This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job, that is the candidate is not in productive work, then an appropriate simulation must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.</td>
<td>This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling associated with a marine environment, or other units requiring the exercise of the skills and knowledge covered by this unit.</td>
<td>Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Evidence can be gathered through a variety of ways including direct observation, supervisor’s reports, project work, samples and questioning. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. The candidate must have access to all tools, equipment, materials and documentation required. The candidate must be permitted to refer to any relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.</td>
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### Evidence Guide cont/d

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<tr>
<th>Consistency of performance</th>
<th>Required skills</th>
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<th>HSC Requirements and Advice</th>
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| Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts. | Look for evidence that confirms skills in:  
- discerning differences in hull shapes and types as well as construction materials, propulsion and steering systems, power plants, ancillary systems, fittings and fastenings  
- reading and interpreting information on identification and compliance plates, registration tags, engine and other component identification numbers  
- identifying different types of power plants, engine cooling and lubrication systems and transmission types. | Look for evidence that confirms knowledge of:  
- typical hull shapes and design features of recreational sail, powered and non-powered craft including but not limited to hard chine, round bilge, planing hulls, multi-hulls, inflatables, rigid and swing keel, centre board  
- typical superstructure configurations and general deck layouts of recreational sail, powered and non-powered craft including but not limited to fully open, flush decks, bow riders, half cabins, fly bridges  
- typical sail and mast arrangements for recreational sailing craft including but not limited to mast configurations, basic rigging arrangements and sail types such as mainsail, genoa, spinnaker etc.  
- construction materials such as glass reinforced plastics and composite materials, aluminium and steel and timber. Timber construction may include clinker, carvel, cold moulded and plywood sheeted etc.  
- types of internal combustion engines used for inboard and outboard propulsion systems including two and four cycle, different cylinder layouts, different fuel types including petrol and diesel, liquid or air cooling, starting systems, lubrication methods  
- propulsion systems including but not limited to single and multi-screw, jet drives, clutches and gearboxes including stern drives and outboard drives as well as vee drives, bow thrusters  
- steering systems including tillers, rods/chains/cable drives, hydraulic, rudder types  
- features and functions of attached navigation and communication devices such as navigational lighting, compass, global positioning system, radar, depth sounder, logs, radios, audible alarms  
- features and functions of trailer components including winches, couplings, load securing, braking, suspension and electrical systems  
- use of information on identification and compliance plates, registration tags, engine and other component identification numbers. | Key Terms and Concepts  
- classification of recreational vessels  
- configuration of motorised propulsion (transmission) system  
- construction materials  
- craft  
- cylinders  
- engine cooling systems  
- engine lubricating systems  
- engine number and model designation  
- fuel system  
- hull forms (shapes and design features)  
- identification and compliance plates  
- internal combustion engines  
- navigation and communication devices  
- propulsion systems  
- recreational boating features  
- recreational boating technologies  
- recreational vessel types  
- registration tags  
- sail and mast arrangements  
- steering systems  
- superstructure configurations and deck layouts  
- system operating purpose  
- correct use of industry terminology  
- trailer components  
- vessel application  
- vessel origin  
- vessel power plant  
- workplace records. |
<table>
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<tr>
<th>Elements</th>
<th>Performance criteria</th>
<th>Range Statement</th>
<th>HSC Requirements and Advice</th>
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<tr>
<td>1 Identify vessel configurations used in boating applications</td>
<td>1.1 Hull forms and superstructure features are identified.</td>
<td>The range statement provides information about the context in which the unit of competency is carried out. The variables [in bold] and scope [dot points] cater for different work requirements, work practices and knowledge between States, Territories and the Commonwealth, and between organisations and workplaces. The range statement relates to the unit as a whole and provides a focus for assessment. Text in italics in the performance criteria is explained here. The following variables may be present and <em>may include</em>, but are not limited to, the examples listed under the scope. All work is undertaken to relevant legislative requirements, where applicable. <strong>There are no variables selected for this unit.</strong></td>
<td><strong>Learning experiences for the HSC must address:</strong> A range of recreational vessel types including: • engine powered • sail powered • rowed. Terminology associated with boating services to enable: • identification and distinction of one vessel from another • classification of recreational boating technologies and features • identification of power and transmission systems • description of system operating purpose. A definition of: • recreational • craft • hull • superstructure • propulsion • power plant • configuration • boating technology • fitting • feature • fixture. A basic knowledge of typical hull shapes and design features of recreational sail, powered and non-powered craft including: • hard chine • round bilge • hulls - planing/displacement - mono/multi • inflatables • keels - rigid - swing • centre board.</td>
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</table>
| 1.2      | Hull designs are matched to normal vessel application. | Knowledge of typical superstructure configurations and general deck layouts of recreational sail, powered and non-powered craft including:  
  • fully open  
  • flush decks  
  • bow rides  
  • half-cabins  
  • fly bridges. | Learning experiences for the HSC must address:  
An understanding of the relationship between hull design/form and use of vessel. |
| 1.3      | Construction materials are identified. | Knowledge of a range of construction materials including:  
  • characteristics  
  • limitations  
  • use/application.  
  Construction materials including:  
  • glass-reinforced plastics  
  • composite materials  
  • aluminium  
  • steel  
  • timber. | Learning experiences for the HSC must address:  
Knowledge of a range of construction materials including:  
  • characteristics  
  • limitations  
  • use/application.  
  Construction materials including:  
  • glass-reinforced plastics  
  • composite materials  
  • aluminium  
  • steel  
  • timber. |
| 2        | Identify and describe the functions of the major systems of a recreational vessel and trailer | 2.1 Systems used for vessel propulsion, steering, navigation, communication, services and appliances are identified and functions explained. | Learning experiences for the HSC must address:  
A basic knowledge of general features, purpose and function of recreational vessel systems including:  
  • vessel propulsion  
    - power  
    - sail  
  • steering  
  • navigation  
  • communication  
  • services  
  • appliances. |
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|           |                      |                | Propulsion systems including:
|           |                      |                | • propeller (screw)
|           |                      |                | - single
|           |                      |                | - multi
|           |                      |                | • jet drives
|           |                      |                | • gearboxes
|           |                      |                | - drives
|           |                      |                | • stern
|           |                      |                | • outboard
|           |                      |                | • vee
|           |                      |                | - bow thrusters.
|           |                      |                | Sail and mast arrangements for recreation sailing craft including:
|           |                      |                | • mast configurations
|           |                      |                | • basic rigging arrangements
|           |                      |                | • sail types
|           |                      |                | - main sail
|           |                      |                | - spinnaker
|           |                      |                | - headsail
|           |                      |                | • genoa
|           |                      |                | • jib.
|           |                      |                | Steering systems including:
|           |                      |                | • tillers
|           |                      |                | • drives
|           |                      |                | - rods
|           |                      |                | - chains
|           |                      |                | - cable
|           |                      |                | - hydraulic
|           |                      |                | • rudder
|           |                      |                | • helm.
|           |                      |                | Navigation and communication devices including:
|           |                      |                | • navigational lighting
|           |                      |                | • compass
|           |                      |                | • global positioning system
|           |                      |                | • radar
|           |                      |                | • depth sounder
|           |                      |                | • logs
|           |                      |                | • radios
|           |                      |                | • audible alarms.
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<tr>
<td>2.2</td>
<td>Trailer components including winching, coupling, load securing, braking, suspension and electrical systems are identified and functions are explained.</td>
<td>Learning experiences for the HSC must address: A basic knowledge of general features, purpose and function of trailer component systems including: • winches • couplings • load securing • braking • suspension • electrical • towing connection • registration.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Use identification information to confirm vessel origins</td>
<td>Learning experiences for the HSC must address: Reading and interpreting information and identification numbers on: • identification plates • compliance plates • registration tags • engines • other components. An awareness of the purpose of information and identification numbers provided.</td>
<td></td>
</tr>
<tr>
<td>3.1</td>
<td>Vessel identification plates and registration tags are located.</td>
<td>Learning experiences for the HSC must address: Standard operating procedures (SOP) and workplace forms for recording vessel identification information.</td>
<td></td>
</tr>
<tr>
<td>3.2</td>
<td>Engine number, model designation and other details are located and recorded.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.3</td>
<td>Identification data is used to confirm vessel year of manufacture, refurbishment (and/or registration).</td>
<td></td>
<td></td>
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<tr>
<td>4</td>
<td>Identify configuration of motorised propulsion systems</td>
<td>Learning experiences for the HSC must address: A basic knowledge of internal combustion engines used for inboard and outboard propulsion systems including: • two cycle/stroke • four cycle/stroke</td>
<td></td>
</tr>
<tr>
<td>4.1</td>
<td>Vessel power plant(s) are located and categorised for fuel system, number and configuration of cylinders.</td>
<td></td>
<td></td>
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<tr>
<td>4.2</td>
<td>Engine cooling and control systems are identified and categorised.</td>
<td></td>
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<tr>
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<td>Performance criteria</td>
<td>Range Statement</td>
<td>HSC Requirements and Advice</td>
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<tr>
<td>4.3</td>
<td>Engine lubricating systems are identified and categorised.</td>
<td></td>
<td>• cylinder layouts</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- number</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- configuration</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- capacity (cc)</td>
</tr>
<tr>
<td>4.4</td>
<td>Vessel propulsion (transmission) system is categorised for type and operation.</td>
<td></td>
<td>• fuel types</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- petrol</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- diesel</td>
</tr>
<tr>
<td>4.5</td>
<td>Operating cycles and cylinder configuration for 2 stroke, 4 stroke, diesel and petrol powered engines are described.</td>
<td></td>
<td>• cooling</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- liquid</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- air</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• starting</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• lubrication.</td>
</tr>
</tbody>
</table>