# CARAVAN INDUSTRY NATIONAL COMPETENCY STANDARDS

# RECREATIONAL VEHICLE MANUFACTURING

# *Unit MEM3.1AA*

# *Manual Production Assembly*

**Unit Descriptor** This unit deals with manual assembly for production. This unit is from the Metals and Engineering Industry Competency Standards.

| Element | | Performance Criteria |
|---|---|---|
| 1 | **Read and understand job sheets** | • Job sheets and instructions are understood and followed correctly. |
| 2 | **Select assembly equipment and components** | • Assembly equipment is selected and used in accordance with instructions or job sheets to standard operation procedures.<br>• Components / sub-assemblies are obtained and arranged for assembly.<br>• Equipment or tools are used in a safe manner. |
| 3 | **Assemble components** | • Assembly is produced following correct sequence of operations using selected equipment as appropriate to standard operation procedures.<br>• Production data is recorded/input, using standard operation procedure. |
| 4 | **Conduct performance tests** | • Assembly is tested / checked for compliance with job sheet requirements using standard operating procedures as required. |
| 5 | **Protect assembly from damage** | • Components and / or assembly are handled and stored in a safe manner least likely to cause damage using standard operating procedures. |

# *Range of Variables*

- Assembly process can be carried out autonomously or in a team environment. This unit applies to assembly operations that are essentially manual in nature and which do not require complex adjustments.
- Where the selection and use of tools is required as part of the assembly process, see Unit MEM 18.1AA Use Hand Tools and Unit MEM 18.2AA Use Power Tools / Hand Held Operations, as appropriate.
- The manufacturing organisation could include sole proprietor, sub-contractor, sub-contracting manufacturer, employer manufacturer.
- All training and work carried-out within this unit must be supervised, directed and in accordance with the Australian Qualifications Framework (AQF) for Level 2 or Level 3 depending on the certificate being sought.

# *Evidence Guide*

**Underpinning Skills and Knowledge:**

- To demonstrate competence, knowledge of and compliance with the Codes of Practice of the Recreational Vehicle Manufacturers' Association of Australia (RVMAA) is required.
- Work activities must be carried-out in accordance with OH&S statutory and organisational policy and procedures.
- To demonstrate competence, evidence of skills and knowledge in the following areas is required:
  - following instructions and specifications
  - following directions
  - following reporting procedures
  - assembly and testing for a typical range of components installed and manufactured by the organisation
  - machines and equipment
  - correct and safe use of tools and equipment
  - personal protective equipment
  - occupational health and safety regulations when assembling and/or constructing components
  - planning and organisation of work
  - maintenance of the work area.

**Context of Assessment:**

- This unit should be assessed on the job. 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.

**Assessment Conditions:**

- The candidate will have access to:
  - all tools, equipment, materials and documentation required.
- The candidate will be permitted to refer to the following documents:
  - any relevant workplace procedures
  - any relevant product and manufacturing specifications
  - any relevant codes, standards, manuals and reference materials.

- The candidate will be required to:
  - orally, or by other methods of communication, answer questions put by the assessor
  - identify colleagues who can be approached for the collection of competency evidence where appropriate
  - present evidence of credit for any off-job training related to this unit.

- 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.

**Special Notes:**

- During assessment the individual will:
  - demonstrate safe working practices at all times
  - communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment
  - take responsibility for the quality of their own work
  - plan tasks in all situations and review tasks requirements as appropriate
  - perform all tasks in accordance with standard operation procedures
  - perform all tasks to specifications
  - use accepted engineering techniques, practices, processes and workplace procedures.

- Tasks involved will be completed within reasonable timeframe relating to typical workplace activities.

**Critical Aspects of Assessment:**

- This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the assembly process or other units requiring the exercise of the skills and knowledge covered by this unit.

**Linkages to Other Units:**

- There is a link between this unit and others. Depending on the industry sector and workplace, combined assessment / training may be appropriate.

| Key Competencies in this Unit | Level |
|---|---|
| Collecting, Organising and Analysing Information | 1 |
| Communicating Ideas and Information | 1 |
| Planning and Organising Activities | 1 |
| Working with Others and in Teams | 1 |
| Using Mathematical Ideas and Techniques | 1 |
| Solving Problems | 1 |
| Using Technology | - |

# *Unit THCMAN01A*

# *Build a Recreational Vehicle Chassis*

**Unit Descriptor** This unit deals with the manufacture of chassis for a recreational vehicle other than a motor home.

| Element | | Performance Criteria |
|---|---|---|
| **1** | **Plan and prepare the construction of the chassis** | • Appropriate drawing plans are selected and reviewed<br>• Metal extrusions are selected in accordance with specifications.<br>• Metal extrusions are measured and marked in accordance with drawing plans.<br>• Materials and components are safely moved and positioned to meet production requirements.<br>• Quality of materials and components is checked. |
| **2** | **Assemble components** | • Safety hazards associated with assembling of components are identified.<br>• Components are assembled as required for specified products in accordance with organisation requirements.<br>• Jigs are used for specified components and/or products in a safe and effective manner.<br>• Jigs are maintained, cleaned and safely stored in designated locations.<br>• Sequence of assembly is conducted in accordance with organisation procedures.<br>• Assembled components are checked for accuracy according with organisation procedures. |
| **3** | **Cut metal extrusions** | • Metal extrusions are prepared for cutting.<br>• Metal extrusions are cut in accordance with drawing plans.<br>• Cut sections are placed in appropriate locations ready for jigging. |
| **4** | **Place chassis sections into jig** | • Chassis jig (where applicable) is prepared for sections.<br>• Sections are placed into jig, aligned and squared and measured in accordance with plans. |
| **5** | **Weld the chassis** | • Chassis form is prepared for welding.<br>• Appropriate welding material and equipment is selected and prepared ready for use.<br>• Chassis is tack welded in appropriate locations and in accordance with established procedures.<br>• The chassis is measured for squareness on completion of tack welding and re-aligned if necessary. |

| | | |
|---|---|---|
| | | • All joining seams of the chassis are welded in accordance with established procedures.<br>• Chassis is turned (where applicable) and joining seams are welded.<br>• All welds are cleaned and inspected in accordance with established control standards.<br>• Faulty welds are prepared for re-welding.<br>• Quality control standards and procedures are applied in accordance with organisation requirements.<br>• VIN plate is fitted to the chassis. |
| **6** | **Fit suspension to completed chassis** | • Axles and springs are fitted in accordance with established requirements and procedures.<br>• Rims and tyres are selected in accordance with design specifications.<br>• If required, tyres are fitted onto rims and inflated following established procedures.<br>• Bearings are packed and assembled onto hubs.<br>• Hubs are fitted to axles.<br>• Handbrake cables are connected.<br>• Wheels are fitted and tightened to recommended specifications. |
| **7** | **Paint chassis** | • Spray gun is made ready for use.<br>• Appropriate clothing and protective equipment is accessed and donned.<br>• Paint is selected, mixed and prepared ready for use in accordance with organisation colour, durability and texture requirements.<br>• Chassis is cleaned of contaminants and prepared for painting.<br>• Ventilation and extraction systems are activated<br>• Primer is applied and allowed the appropriate period to dry.<br>• Final coat is applied and allowed the appropriate period to dry. |
| **8** | **Fit braking system** | • Electric braking mechanisms are fitted in accordance with established standards.<br>• Electric braking systems are wired and tested to ensure appropriate operation. |
| **9** | **Fit water tank** | • Appropriate size water tank is selected.<br>• Water tank is fitted to the chassis in accordance with organisation standards.<br>• Inlet an outlet of the water tank is sealed to ensure tank is free from contamination. |

## *Range of Variables*

- The manufacturing organisation could include:
  - sole proprietor
  - sub-contractor
  - sub-contracting manufacturer
  - employer/manufacturer.

- Tools and equipment may include:
  - hand tools
  - powered static tools
  - powered portable tools
  - air tools.

- Welding may include:
  - electric welding
  - oxy-acetylene welding
  - MIG
  - spot (pedestal and portable)
  - seam
  - robotic
  - TIG Welding.

- Types of welds may include:
  - edge
  - butt
  - fillet
  - lap.

- Selected materials may include:
  - galvanized or raw steel extrusions
  - spray or hand paint
  - cold galvanizing.

- Components may include:
  - independent or fixed suspension
  - fibreglass, plastic or metal water tank.

# *Evidence Guide*

**Underpinning Skills and Knowledge:**

- To demonstrate competence, knowledge of and compliance with the Codes of Practice of the Recreational Vehicle Manufacturers' Association of Australia (RVMAA) is required.
- Work activities must be carried-out in accordance with OH&S statutory and organisational policy and procedures.
- Knowledge is required of:
  - working drawings of components manufactured by the organisation
  - correct and safe use of tools and equipment
  - components and products manufactured by the organisation
  - personal protective equipment
  - occupational health and safety regulations
  - general duty of care
  - welding
  - planning and organisation of work
  - maintenance of the work area.

**Context of Assessment:**

- This unit can be assessed on or off the job. Assessment should include practical demonstration either in the workplace or within a simulated environment, with access to necessary equipment and materials. This should be supported by a range of methods to assess underpinning knowledge.
- Competency is to be demonstrated by construction of a component (in the Range of Variables), using the required materials and tools.

**Critical Aspects of Assessment:**

- Evidence should include a demonstrated ability to:
  - complete work to specifications and plans
  - complete work to meet established timelines
  - comply with all occupational health and safety requirements
  - solve problems as they arise
  - rectify faults encountered
  - maintain a clean and tidy work area.
- Evidence of familiarity with organisation policies, processes and procedures is also required.

**Linkages to Other Units:**

- There is a link between this unit and others. Depending on the industry sector and workplace, combined assessment/training may be appropriate. Examples may include but are not limited to:
  - THCMAN02A Build the Floor for a Recreational Vehicle
  - THCMAN03A Construct and Install the Walls and Roof for a Recreational Vehicle
  - MEM3.1AA Manual Production Assembly.

| **Key Competencies in this Unit** | **Level** |
|---|---|
| Collecting, Organising and Analysing Information | 2 |
| Communicating Ideas and Information | 2 |
| Planning and Organising Activities | 2 |
| Working with Others and in Teams | 2 |
| Using Mathematical Ideas and Techniques | 2 |
| Solving Problems | 2 |
| Using Technology | - |

# *Unit THCMAN02A*
# *Build the Floor for a Recreational Vehicle*

**Unit Descriptor** This unit deals with the assembly of the floor components for a recreational vehicle.

| Element | Performance Criteria |
|---|---|
| **1 Plan and prepare construction of the floor** | • Plans are read and interpreted.<br>• Materials are selected in accordance with plans and organisation requirements.<br>• Tools are selected to meet the job requirements.<br>• Tools and equipment are checked and maintained in accordance with organisation requirements.<br>• Materials and components are safely moved and moved and positioned to meet production requirements.<br>• Quality of materials and components is checked. |
| **2 Cut and fit floor** | • Sections of the floor are cut in accordance with working drawings.<br>• Floor sections are fitted into place with the support of jigs.<br>• The floor is trimmed to meet the required shape.<br>• Adhesives, sealants are applied between the floor and the chassis in accordance with organisation requirements.<br>• Nuts, bolts, screws, washers and fasteners are fitted to the designated positions in accordance with the working drawings.<br>• Solvents are use to remove excess adhesives and sealants.<br>• Safe handling procedures with solvents are followed. |
| **3 Cut and fit floorcovering** | • Floorcovering is selected in accordance with organisation requirements.<br>• Floorcovering is cut to the working drawings and placed in position to ensure correct alignment.<br>• Adhesives, sealants are applied to the floor.<br>• Floorcovering is laid and trimmed in accordance with organisation requirements.<br>• Solvents are use to remove excess adhesives and sealants.<br>• Safe handling procedures with the solvents are followed<br>• Completed job is checked to ensure requirements have been fully met. |

## *Range of Variables*

- The manufacturing organisation could include:
  - sole proprietor
  - sub-contractor
  - sub-contracting manufacturer
  - employer manufacturer.

- Tools and equipment may include:
  - hand tools
  - powered static tools
  - powered portable tools
  - impact guns
  - robotic equipment
  - air tools.

- Jigs may include:
  - quick release grip
  - screwed grips
  - automatic grips.

- Selected materials may include:
  - chipboard
  - custom wood
  - marine ply
  - vinyl – sheet or tiles
  - carpet – full cover of tiles
  - combination of both vinyl and carpet
  - nuts, bolts, screws, staples, washers and fasteners, varies lengths and tensions.

# *Evidence Guide*

**Underpinning Skills and Knowledge:**

- To demonstrate competence, knowledge of and compliance with the Codes of Practice of the Recreational Vehicle Manufacturers' Association of Australia (RVMAA) is required.
- Work activities must be carried-out in accordance with OH&S statutory and organisational policy and procedures.
- Knowledge is required of:
    - working drawings of components manufactured by the organisation
    - instructions and specifications
    - correct and safe use of tools and equipment
    - components and products manufactured by the organisation
    - personal protective equipment
    - occupational health and safety regulations
    - general duty of care
    - welding
    - carpentry
    - floorcovering
    - portable and fixed power tools
    - planning and organisation of work
    - maintenance of work area.

**Context of Assessment:**

- This unit can be assessed on or off the job. Assessment should include practical demonstration either in the workplace or within a simulated environment, with access to all equipment and materials. This should be supported by a range of methods to assess underpinning knowledge.

**Critical Aspects of Assessment:**

- Evidence should include a demonstrated ability to:
  - complete work to specifications and plans
  - complete work to meet established timelines
  - comply with all occupational health and safety requirements
  - solve problems as they arise
  - rectify faults encountered
  - maintain a clean and tidy work area.

- Evidence of familiarity with organisation policies, processes and procedures is also required.

**Linkages to Other Units:**

- There is a link between this unit and others. Depending on the industry sector and workplace, combined assessment / training may be appropriate. Examples may include but are not limited to:
  - THCMAN01A Build a Recreational Vehicle Chassis
  - MEM3.1AA Manual Production Assembly.

| **Key Competencies in this Unit** | **Level** |
|---|---|
| Collecting, Organising and Analysing Information | 2 |
| Communicating Ideas and Information | 2 |
| Planning and Organising Activities | 2 |
| Working with Others and in Teams | 2 |
| Using Mathematical Ideas and Techniques | 2 |
| Solving Problems | 2 |
| Using Technology | - |

# *Unit THCMAN03A*

# *Construct and Install the Walls and Roof for a Recreational Vehicle*

**Unit Descriptor** This unit deals with the manufacture of the roof and walls for a recreational vehicle.

| Element | | Performance Criteria |
|---|---|---|
| **1** | **Plan construction of the roof and walls** | • Working drawings are read and interpreted.<br>• Materials are selected in accordance with plans and organisation requirements.<br>• Tools are selected to meet the job requirements.<br>• Tools and equipment are checked and maintained.<br>• If required, appropriate jigs are selected and placed in position. |
| **2** | **Construct framework for walls and roof** | • Framework material is cut to required size in accordance with working drawings and secured into the jig.<br>• Framework is fixed at joining points in accordance with working drawings and organisation requirements.<br>• Completed framework is removed from jig and placed in allocated locations ready for assembly. |
| **3** | **Erect walls and fit roof** | • Plywood is cut to the measurement of the framework (where appropriate).<br>• Plywood is jigged to the framework and fixed (where appropriate).<br>• Furniture is placed onto the chassis of the recreational vehicle.<br>• Completed walls are fitted to the chassis.<br>• Walls are fixed to the chassis in accordance with organisation requirements.<br>• Roof assembly is placed into position and fixed in accordance with organisation standards. |
| **4** | **Construct a pop-up roof** | • Working drawings are read and interpreted.<br>• Materials are selected in accordance with plans and organisation requirements.<br>• Tools are selected to meet the job requirements.<br>• Appropriate jigs are selected and placed in position.<br>• Framework is cut, mitred and placed into jig.<br>• Framework is welded in accordance with organisation requirements.<br>• Welded points are cleaned and touched-up with matching paint. |

- Roof frame is wired with 12V DC harness and 240V AC in accordance with organisation standards and National Electrical Standards and State licensing requirements.
- Insulation is installed.
- Roof lining cut to size located and fixed in accordance with organisation requirements.
- Roof lifting mechanism and completed pop-up roof are fitted into place according to organisation specifications
- Job is checked to ensure it is free of faults and meets requirements.

# *Range of Variables*

- The manufacturing organisation could include:
  - sole proprietor
  - sub-contractor
  - sub-contracting manufacturer
  - employer/manufacturer.

- Tools and equipment may include:
  - hand tools
  - powered static tools
  - powered portable tools
  - impact guns
  - robotic equipment
  - air tools.

- Jigs may include:
  - fixed
  - portable
  - quick release grip
  - screwed grips
  - automatic grips.

- Welding may include:
  - MIG
  - electric
  - oxy-acetylene
  - TIG welding.

- Selected materials may include:
  - composite boards
  - marine ply
  - mechanical rises
  - gas rises
  - fibreglass
  - timber frames
  - aluminium extrusion frames
  - powder coated frames
  - hand painted frames
  - spray painted frames

- pop rivets
- nuts, bolts, screws, washers and fasteners, staples; of various lengths and tensions.

# *Evidence Guide*

**Underpinning Skills and Knowledge:**

- To demonstrate competence, knowledge of and compliance with the Codes of Practice of the Recreational Vehicle Manufacturers' Association of Australia (RVMAA) is required.
- Work activities must be carried-out in accordance with OH&S statutory and organisational policy and procedures.
- Knowledge is required of:
    - working drawings of components manufactured by the organisation
    - instructions and specifications
    - correct and safe use of tools and equipment
    - components and products manufactured by the organisation
    - personal protective equipment
    - occupational health and safety regulations
    - general duty of care
    - welding
    - carpentry
    - planning and organisation of work
    - portable and fixed power tools
    - maintenance of the work area.

**Context of Assessment:**

- This unit can be assessed on or off the job. Assessment should include practical demonstration either in the workplace or within a simulated environment, with access to necessary equipment and materials. This should be supported by a range of methods to assess underpinning knowledge.

**Critical Aspects of Assessment:**

- Evidence should include a demonstrated ability to:
  - complete work to specifications and plans
  - complete work to meet established timelines
  - comply with all occupational health and safety requirements
  - solve problems as they arise
  - rectify faults encountered
  - maintain a clean and tidy work area.

- Evidence of familiarity with organisation policies, processes and procedures is also required.

**Linkages to Other Units:**

- There is a link between this unit and a range of other units.

- Depending on the industry sector and workplace, combined assessment/training may be appropriate. For example:
  - THCMAN02A Build the Floor for a Recreational Vehicle.

| Key Competencies in this Unit | Level |
|---|---|
| Collecting, Organising and Analysing Information | 2 |
| Communicating Ideas and Information | 2 |
| Planning and Organising Activities | 2 |
| Working with Others and in Teams | 2 |
| Using Mathematical Ideas and Techniques | 2 |
| Solving Problems | 2 |
| Using Technology | - |

# *Unit THCMAN04A*
# *Install 12 Volt DC Cabling in a Recreational Vehicle*

**Unit Descriptor**

This unit deals with the fitting of 12 Volt DC electrical wiring of the recreational vehicle chassis and cabin. This Unit of Competency only applies to DC current. It is not to be used for training and assessment dealing with AC current. National/State/ Territory Authorities require installers of AC wiring into a recreational vehicle to be licensed as an Electrical Contractor.

| Element | | Performance Criteria |
|---|---|---|
| **1** | **Plan the 12 V DC electrical wiring** | • Electrical working drawings are interpreted.<br>• Type, colour and rating of electrical cabling are selected.<br>• Materials are selected in accordance with plans and organisation requirements.<br>• Tools are selected to meet the job requirements.<br>• Tools and equipment are checked and maintained in accordance with organisation requirements. |
| **2** | **Install 12 V DC wiring** | • Wiring harness is prepared in accordance with drawings and organisation standards.<br>• Appropriate holes are located and drilled in the framework and grommeted ready for cabling in accordance with organisation standards.<br>• Switches, light fittings and terminal points are cut in the wall, roof in accordance with drawings.<br>• Wiring harness is cabled in accordance with electrical drawings and terminated at switches and light fitting points.<br>• Fuse terminal box is installed and wiring is terminated.<br>• Wiring harness is secured within the frame in accordance with organisation requirements. |
| **3** | **Fit switches and light fittings** | • Switches and light fittings are selected in accordance with design plans.<br>• Termination wiring is checked for continuity.<br>• Light fittings and switches are installed and connected to wiring in accordance with electrical drawings and design plans.<br>• Fuses are installed and wiring, switches and lights are tested.<br>• Faults are rectified. |

| | | |
|---|---|---|
| **4** | **Complete chassis wiring** | • Chassis light are selected and fixed to the chassis in accordance with drawings.<br>• Wiring harness is fitted to the chassis in accordance with drawings.<br>• Chassis lights are wired in accordance with electrical drawings.<br>• Trailer plug is connected and wiring and lights are tested<br>• Faults are rectified. |
| **5** | **Install battery** | • Battery installation is conducted in accordance with drawings.<br>• Battery is correctly and firmly secured.<br>• Cable connections are fitted to battery terminals.<br>• Cleanliness of battery terminals and cable connections is maintained.<br>• Appropriate corrosion prevention is applied to terminals.<br>• Connections and battery capacity are tested.<br>• Faults are rectified. |

# *Range of Variables*

- The manufacturing organisation could include:
  - sole proprietor
  - sub-contractor
  - sub-contracting manufacturer
  - employer/manufacturer.

- The definition of a recreational vehicle will include:
  - caravan
  - pop-top caravan
  - camper trailer
  - tent trailer
  - 5th wheeler
  - slide on camper
  - campervan
  - motor home.

- Tools and equipment may include:
  - hand tools
  - powered static tools
  - powered portable tools
  - impact guns
  - robotic equipment
  - air tools
  - ohm meters
  - volt meters
  - circuit testers.

- Selected materials may include:
  - nuts, bolts, screws, washers and fasteners, rubber or nylon grommets
  - electrical connectors, terminal blocks, fuse blocks, fuses, 12V DC lights and switches
  - vehicle to chassis male and female connectors
  - chassis wiring conduit and clamps
  - manufactured wiring harness or free cabling.

- Connection to appliances will include:
  - water heaters
  - water pumps
  - power point provisions will be made for 12 V AC radios and TVs.

# *Evidence Guide*

**Underpinning Skills and Knowledge:**

- To demonstrate competence, knowledge of and compliance with Codes of practice of the Recreational Vehicle Manufacturers Association of Australia (RVMAA) is required.
- Work activities must be carried-out in accordance with OH&S statutory and organisational policy and procedures.
- To demonstrate competence, evidence of skills and knowledge in the following areas is required:
  - electrical working drawings of components manufactured by the organisation
  - instructions and specifications
  - correct and safe use of tools and equipment
  - components and products manufactured by the organisation
  - personal protective equipment
  - occupational health and safety regulations
  - general duty of care
  - electrical circuitry
  - 12v DC circuit wiring methods and technology
  - portable and fixed power tools
  - planning and organisation of work
  - maintenance of the work area.

**Context of Assessment:**

- This unit can be assessed on or off the job. Assessment should include practical demonstration either in the workplace or within a simulated environment, with access to necessary equipment and materials. This should be supported by a range of methods to assess underpinning knowledge.
- Competency is to be demonstrated by the performance (under limited guidance) by using the required materials for the installation of 12V DC cabling in a recreational vehicle.

**Critical Aspects of Assessment:**

- Evidence should include a demonstrated ability to:
  - complete work to specifications and plans
  - complete work to meet established timelines
  - comply with all occupational health and safety requirements
  - solve problems as they arise
  - rectify faults encountered
  - maintain a clean and tidy work place.

- Evidence of familiarity with organisation policies, processes and procedures is also required.

**Linkages to Other Units:**

- There is a link between this unit and other units. Depending on the industry sector and workplace, combined assessment / training may be appropriate.

| **Key Competencies in this Unit** | **Level** |
|---|---|
| Collecting, Organising and Analysing Information | 2 |
| Communicating Ideas and Information | 2 |
| Planning and Organising Activities | 2 |
| Working with Others and in Teams | 2 |
| Using Mathematical Ideas and Techniques | 2 |
| Solving Problems | 2 |
| Using Technology | 1 |

# *Unit THCMAN05A*

# *Install LP Gas Systems in Recreational Vehicles*

**Unit Descriptor** This unit deals with the skills and knowledge necessary to install LP gas systems in a recreational vehicle. This unit is relates to the General Plumbing (Trades) - Services National Competency Standards Unit No. 3011.

| Element | Performance Criteria |
|---|---|
| **1 Apply LPG safe handling procedures** | • Characteristics of petroleum products are understood.<br>• Nature and characteristics of LPG are identified and understood.<br>• Safe application and handling procedures of LPG are followed.<br>• Staff responsibilities with regard to safe working practices with petroleum are identified and understood.<br>• Emergency procedures are followed in the case of an LPG leak.<br>• Emergency procedures are followed in the case of an LPG explosion or fire.<br>• LPG material safety data is identified.<br>• Application for portable extinguishing equipment is correctly identified.<br>• HAZCHEM, HAZMAT signage is identified. |
| **2 Plan the job** | • Plans/specifications are obtained and interpreted.<br>• All necessary and appropriate tasks are planned in conjunction with others involved or affected by the work.<br>• Gas load/design requirements are determined from design drawing or given by qualified source.<br>• Storage capacity is calculated using recognised formulae or tables acceptable to the relevant State Authority.<br>• Capacity selected is adequate for the load details given in the job instruction.<br>• Capacity selected for the application does not exceed requirements given in AG 601. |

| | | |
|---|---|---|
| **3** | **Design the system** | • Type of system selected, (one or two cylinders), is appropriate for given design information.<br>• Regulator size is calculated using acceptable tables or formulae.<br>• Selected regulator capacity is adequate for the load detailed in the design information.<br>• Location of cylinders complies with AG 601 and job specification.<br>• Location of appliance/s complies with AG 601.<br>• Piping selected complies with AG 601.<br>• Ventilation complies with AG.601. |
| **4** | **Calculate the size of piping system** | • Size of piping is calculated using recognised formulae or tables acceptable to the Authority.<br>• Size selected for main run and branches provides minimum inlet pressure to each appliance in accordance with AG 601.<br>• Piping system is not oversized for the dimensions and loads given in the design drawing or instruction. |
| **5** | **Set out the position of the piping system** | • Set-out of piping system is in accordance with design drawing or instruction and complies with AG 601.<br>• Set-out is correct for given position of appliances and cylinders. |
| **6** | **Estimate and order materials** | • Quantity and type of materials are estimated from design drawing or on site dimensions.<br>• Pipe and fittings selected comply with AG 601.<br>• Materials and components selected comply with AG 601.<br>• Material quantities ordered are sufficient to complete the installation. |
| **7** | **Organise delivery of materials and components** | • Materials, equipment, appliance/s and cylinder/s delivered correspond with order form/delivery docket.<br>• Materials, equipment, appliance/s and cylinder/s are checked for acceptable condition. |
| **8** | **Install the system** | • Personal protective equipment is used in accordance with OH&S requirements.<br>• Manual lifting and handling equipment/techniques are in accordance with OH&S requirements.<br>• Tools and equipment are used in a safe manner.<br>• Cylinder/s installed are in accordance with AG 601 (including ventilation). |

| | | |
|---|---|---|
| | | • Size of connection between regulator and cylinder/s is determined using standard tables of formulae.<br>• Installation of regulator and associated pipework complies with AG 601.<br>• Support system and installation method comply with AG 601.<br>• Fixing is installed to manufacturer's specification.<br>• Installed piping system complies with AG 601 and job drawing.<br>• Appliances are installed in accordance with AG 601.<br>• Appliance air supply provided complies with AG 601 (including ventilation).<br>• Consumer instruction plates and labels are located in accordance with AG 601.<br>• Compliance plates are fitted in accordance with the relevant State/Territory authority's requirements. |
| **9** | **Test system** | • Regulator is adjusted to provide flow pressure which complies with AG 601.<br>• Test apparatus is selected is appropriate for the work.<br>• Caravan system tested in accordance with AG 601.<br>• System is gas lit in accordance with the Authority's requirements.<br>• Ventilation is checked to ensure compliance with requirements.<br>• Test data is recorded in the format required by the relevant State/Territory authority or job specification. |

## *Range of Variables*

- The manufacturing organisation could include:
  - sole proprietor
  - sub-contractor
  - sub-contracting manufacturer
  - employer manufacturer.
- Licensing arrangements required by State, National and Territory Authorities.

# *Evidence Guide*

**Underpinning Skills and Knowledge:**

- To demonstrate competence, knowledge of and compliance with the Codes of Practice of the Recreational Vehicle Manufacturers Association of Australia (RVMAA) is required.
- Work activities must be carried-out in accordance with OH&S statutory and organisational policy and procedures.
- To demonstrate competence, evidence of skills and knowledge in the following areas is required:
  - working drawings of components manufactured by the organisation
  - instructions and specifications
  - correct and safe use of tools and equipment
  - components and products manufactured by the organisation
  - personal protective equipment
  - occupational health and safety regulations
  - general duty of care
  - portable and fixed power tools
  - safe handling and emergency management
  - calculation of storage capacity
  - requirements of AG 601
  - types of systems
  - calculation of size of piping
  - installation procedures and processes
  - planning and organisation of work
  - maintenance of the work area.

**Context of Assessment:**

- This unit can be assessed on or off the job. Assessment should include practical demonstration either in the workplace or within a simulated environment, with access to all necessary equipment and materials. This should be supported by a range of methods to assess underpinning knowledge.

**Critical Aspects of Assessment:**

- Evidence should include a demonstrated ability to:
  - complete work to specifications and plans
  - complete work to meet established timelines
  - comply with all occupational health and safety requirements
  - solve problems as they arise
  - rectify faults encountered
  - maintain a clean and tidy work area.

- Evidence of familiarity with organisation policies, processes and procedures is also required.

**Linkages to Other Units:**

- There is a link between this unit and others. Depending on the industry sector and workplace, combined assessment/training may be appropriate. For example:
  - THCMAN07A Install and Connect the Low Pressure Water System within a Recreational Vehicle.

| **Key Competencies in this Unit** | **Level** |
|---|---|
| Collecting, Organising and Analysing Information | 2 |
| Communicating Ideas and Information | 2 |
| Planning and Organising Activities | 3 |
| Working with Others and in Teams | 2 |
| Using Mathematical Ideas and Techniques | 2 |
| Solving Problems | 2 |
| Using Technology | 1 |

# *Unit THCMAN06A*

# *Install Furniture and Appliances in a Recreational Vehicle*

**Unit Descriptor** This unit deals with the skills and knowledge necessary to install cabinet making components, conveniences, appliances and other products into a caravan. This unit relates to National Furnishings Industry Competency Standard - Hard Stream #HS 18.

| | Element | Performance Criteria |
|---|---|---|
| 1 | **Use specifications to determine installation requirements** | • Location and positioning of components and / or final product is correctly identified.<br>• Type of fixing surface is correctly identified.<br>• Special instructions are recorded in accordance with organisation procedures.<br>• Discrepancies are reported to designated person or persons, and or appropriate action is taken to rectify according to organisation procedures. |
| 2 | **Investigate site restraints and develop solutions** | • Safety hazards are identified and acted upon to reduce possible injury to self and others.<br>• Components and or final product are checked to ensure all is complete, damage free and meets the requirements of the specification and or job sheet.<br>• On-site difficulties are identified and appropriate action taken to resolve in accordance with organisation requirements.<br>• Discrepancies and or faults are reported to designated person or persons, or appropriate action taken to rectify in accordance with organisation procedures.<br>• Appropriate packaging materials are applied to ensure adequate protection existing fixtures and fittings in accordance with organisation requirements. |
| 3 | **Implement the installation of components and final products** | • Safety hazards are identified and acted on to reduce possible injury to self and others.<br>• Components and or final products are assembled and or installed in accordance with specifications and organisation requirements.<br>• Suitable installation methods are applied according to specification and or organisation requirements.<br>• Components and or final product are checked for accuracy and stability according to organisation requirements. |

| | | |
|---|---|---|
| | | • Variations in product quality due to installation or material faults are identified and reported to designated person or persons, or appropriate action is taken to rectify in accordance with organisation procedures. |
| **4** | **Conduct final inspection on completion** | • Completed project is assessed against the requirements of the specification.<br>• Installed component and or final product are assessed for quality of finish in accordance with organisation standard and requirements.<br>• All necessary paperwork required for both the customer and organisation records are completed in accordance with organisation requirements. |
| **5** | **Manage clean up procedures** | • Work areas are cleaned according to organisation requirements.<br>• All tools and equipment are maintained, cleaned and stored safely in designated locations.<br>• Waste materials are disposed of safely in accordance with relevant statutory regulations and organisation requirements. |

# *Range of Variables*

- The manufacturing organisation could include:
  - sole proprietor
  - sub-contractor
  - sub-contracting manufacturer
  - employer/manufacturer.

- The definition of a recreational vehicle will include:
  - caravan
  - pop-top caravan
  - camper trailer
  - tent trailer
  - 5th wheeler
  - slide-on camper
  - campervan
  - motor home.

- Tools and equipment may include:
  - basic hand tools
  - portable power tools
  - power operated equipment
  - air tools.

- Selected materials may include:
  - adhesives
  - aluminium
  - cardboard
  - fillers
  - finishes
  - flat boards, composites, ply wood etc
  - glass
  - laminates
  - metals
  - mouldings
  - plastics
  - solid timbers
  - veneers
  - vinyl, and other specified materials.

- Components may include:
  - cupboards
  - benches
  - frames
  - mountings
  - doors
  - refrigerator
  - beds
  - microwave oven
  - chemical toilets
  - shower cubicle
  - hand basin
  - vanity
  - kitchen sink
  - curtains
  - water heater
  - airconditioner
  - fire extinguisher (ADR 44.8.3).
- Installation of appliances must comply with the Standards and Directives in force at the time of manufacture; e.g. AG 601 for gas appliances and AS3001 for electrical appliances.

# *Evidence Guide*

**Underpinning Skills and Knowledge:**

- To demonstrate competence, knowledge of and compliance with the Codes of Practice of the Recreational Vehicle Manufacturers Association of Australia (RVMAA) is required.
- Work activities must be carried-out in accordance with OH&S statutory and organisational policy and procedures.
- To demonstrate competence, evidence of skills and knowledge in the following areas is required:
  - working drawings of components manufactured by the organisation
  - instructions and specifications
  - correct and safe use of tools and equipment
  - components and products manufactured by the organisation
  - personal protective equipment
  - occupational health and safety regulations
  - general duty of care
  - carpentry
  - floorcovering
  - safe disposal of toilet waste
  - use and care of portable and fixed power tools
  - planning and organisation of work
  - maintenance of the work area.

**Context of Assessment:**

- This unit can be assessed on or off the job. Assessment should include practical demonstration either in the workplace or through simulation, with access to all necessary equipment and materials. This should be supported by a range of methods to assess underpinning knowledge.
- Competency is to be demonstrated by the use of at least two materials for the installation of components or final products (in the Range of Variables).

**Critical Aspects of Assessment:**

- Evidence should include a demonstrated ability to:
  - complete work to specifications and plans
  - complete work to meet established timelines
  - comply with all occupational health and safety requirements
  - solve problems as they arise
  - rectify faults encountered
  - maintain a clean and tidy work area.

- Evidence of familiarity with organisation policies, processes and procedures is also required.

**Linkages to Other Units:**

- There is a link between this unit and others. Depending on the industry sector and workplace, combined assessment/training may be appropriate. Examples may include but not limited to:
  - THCMAN03A Construct and Install the Walls and Roof for a Recreational Vehicle
  - THCMAN09A Build Furniture for a Recreational Vehicle.

| Key Competencies in this Unit | Level |
|---|---|
| Collecting, Organising and Analysing Information | 2 |
| Communicating Ideas and Information | 2 |
| Planning and Organising Activities | 2 |
| Working with Others and in Teams | 2 |
| Using Mathematical Ideas and Techniques | 1 |
| Solving Problems | 2 |
| Using Technology | - |

# *Unit THCMAN07A*

# *Install and Connect the Low Pressure Water System within a Recreational Vehicle*

**Unit Descriptor**

This unit deals with the installation of a low pressure water supply system within a recreational vehicle. This Unit of Competency only applies to the tubing of water supply within a recreational vehicle and is not to be used for the development of training and assessment dealing with plumbing. Where a recreational vehicle is connected to a mains water supply, a non-return valve approved by the relevant National/State/Territory authority must be installed at the water source.

| Element | Performance Criteria |
|---|---|
| **1 Plan installation of water tubing** | • Working drawings are interpreted.<br>• Type and size of tubing and fittings is selected in accordance with plans and organisation requirements.<br>• Materials are selected in accordance with plans and organisation requirements.<br>• Tools are selected to meet the job requirements.<br>• Tools and equipment are checked and maintained in accordance with organisation requirements. |
| **2 Install piping** | • Water tubing is prepared in accordance with drawings and organisation standards.<br>• Appropriate holes are located and drilled in the framework and grommeted ready for tubing in accordance with organisation standards.<br>• Water terminal points are cut in the wall in accordance with drawings.<br>• Tubing is run in accordance with drawings and terminated at water outlet points.<br>• Tubing is connected to water tank in series with water pump.<br>• Water inlet is positioned and secured in accordance with organisation design.<br>• Tubing is secured within the frame in accordance with organisation requirements. |

| | | |
|---|---|---|
| **3** | **Install water fittings** | • Water fittings are selected in accordance with design plans.<br>• Water fittings are installed and connected to terminated tubing accordance with drawings and design plans.<br>• Tubing is pressure tested, leaks are rectified.<br>• Mains water inlet is tested.<br>• Water pump is tested. |
| **4** | **Install drainage** | • Drainage is fitted to sinks, showers and basins and sealed.<br>• Drainage outlets are secured to chassis and piped to main outlet in accordance with organisation requirements.<br>• Drains are tested and faults rectified. |

# *Range of Variables*

- The manufacturing organisation could include:
  - sole proprietor
  - sub-contractor
  - sub-contracting manufacturer
  - employer/manufacturer.

- Tools and equipment may include:
  - hand tools
  - powered static tools
  - powered portable tools
  - impact guns
  - robotic equipment
  - air tools
  - water pressure test kit.

- Selected materials may include:
  - nuts, bolts, screws, washers and fasteners, saddles, clamps and rubber or nylon grommets
  - hard drawn tubing, hard drawn tubing
  - silicon, sealants
  - O rings and fibre washers
  - PVC drainage, saddles and clamps.

# *Evidence Guide*

**Underpinning Skills and Knowledge:**

- To demonstrate competence, knowledge of and compliance with the Codes of Practice of the Recreational Vehicle Manufacturers Association of Australia (RVMAA) is required.
- Work activities must be carried-out in accordance with OH&S statutory and organisational policy and procedures.
- To demonstrate competence, evidence of skills and knowledge in the following areas is required:
  - working drawings of components manufactured by the organisation
  - instructions and specifications
  - correct and safe use of tools and equipment
  - components and products manufactured by the organisation
  - personal protective equipment
  - occupational health and safety regulations
  - general duty of care
  - welding
  - plumbing
  - floorcovering
  - use and care of portable and fixed power tools
  - planning and organisation of work
  - maintenance of the work area.

**Context of Assessment:**

- This unit can be assessed on or off the job. Assessment should include practical demonstration in the workplace or within a simulated environment, with access to all necessary equipment and materials. This should be supported by a range of methods to assess underpinning knowledge.

**Critical Aspects of Assessment:**

- Evidence should include a demonstrated ability to:
  - complete work to specifications and plans
  - complete work to meet established timelines
  - comply with all occupational health and safety requirements
  - solve problems as they arise
  - rectify faults encountered
  - maintain a clean and tidy work area.

- Evidence of familiarity with organisation policies, processes and procedures is also required.

**Linkages to Other Units:**

- There is a link between this unit and others. Depending on the industry sector and workplace, combined assessment/training may be appropriate. Examples may include but not limited to:
  - THCMAN05A Install LP Gas System in a Recreational Vehicle
  - THCMAN06A Install Furniture and Appliances in a Recreational Vehicle.

| Key Competencies in this Unit | Level |
|---|---|
| Collecting, Organising and Analysing Information | 2 |
| Communicating Ideas and Information | 2 |
| Planning and Organising Activities | 2 |
| Working with Others and in Teams | 2 |
| Using Mathematical Ideas and Techniques | 2 |
| Solving Problems | 2 |
| Using Technology | 1 |

# *Unit THCMAN08A*

# *Sheet, Glaze and Finish a Recreational Vehicle*

**Unit Descriptor** This unit deals with the sheeting, fitting of windows, door, trims, decals, cleaning and final inspection of a recreational vehicle.

| Element | Performance Criteria |
|---|---|
| **1 Plan and prepare the sheeting** | • Drawings are reviewed and interpreted.<br>• Metal sheeting is selected in accordance with organisation specifications.<br>• Metal sheeting is measured and marked in accordance with drawings.<br>• Windows and door are selected in accordance with organisation specifications.<br>• Materials and components are safely moved and positioned to meet production requirements.<br>• Quality of materials and components is checked. |
| **2 Assemble components** | • Safety hazards associated with assembling of components are identified.<br>• Relevant statutory regulations are stated and acted on to reduce possible injury to self and others.<br>• Components are assembled as required for specified products in accordance with organisation requirements.<br>• Jigs are used for specified components and / or products in a safe and effective manner.<br>• Jigs are maintained, cleaned and safely stored in designated locations.<br>• Sequence of assembly is conducted in accordance with organisation procedures.<br>• Assembled components are checked for accuracy according to organisation procedures.<br>• Quality control procedures are applied in accordance with organisation procedures.<br>• Variations in product quality due to process or material faults are identified and reported in accordance with organisation procedures. |
| **3 Carry out sheeting** | • Sheeting is prepared for cutting.<br>• Sheeting is cut in accordance with drawing plans.<br>• Framework of the recreational vehicle is prepared in accordance with organisation procedures.<br>• Sheeting is fixed to the recreational vehicle in accordance with organisation procedures. |

| | | |
|---|---|---|
| **4** | **Fit windows, door and accessories** | • Windows are fitted and sealed in accordance with organisation requirements.<br>• Trims and flashings are fitted and sealed around the door and windows frames in accordance with organisation procedures.<br>• Corners and edges of the recreational vehicle are flashed, trimmed and sealed in accordance with organisation procedures.<br>• Fit steps as appropriate in accordance with organisation procedures.<br>• Door is swung, flashings are sealed and door locks are fitted in accordance with organisation requirements.<br>• Stone guards are fitted in accordance with organisation requirements.<br>• Tail and side lights, lenses and trims are assembled and fitted.<br>• Locking down roof clamps for pop-up roof type recreational vehicle are fitted.<br>• Corner stabilisers and grab handles are fitted.<br>• Additional accessories are fitted if desired or required in accordance with organisation procedures, such as side awnings and air conditioner.<br>• Excess sealant is removed safely with solvent. |
| **5** | **Complete finishing procedures** | • Work is inspected and areas are touched up were necessary in accordance with organisation requirements.<br>• Striping, branding and decals are applied to the recreational vehicle in accordance with organisation requirements.<br>• Recreational vehicle is cleaned throughout with organisation company requirements/company standards.<br>• A final inspection of the recreational vehicle is carried out. |

## *Range of Variables*

- The manufacturing organisation may include:
  - sole proprietor
  - sub-contractor
  - sub-contracting manufacturer
  - employer/manufacturer.

- The definition of a recreational vehicle may include:
  - caravan
  - pop-top caravan
  - camper trailer
  - tent trailer
  - 5th wheeler
  - slide-on camper
  - campervan
  - motor home.

- Tools and equipment may include:
  - hand tools
  - powered static tools
  - powered portable tools
  - air tools
  - robotic.

- Selected materials may include:
  - steel, aluminium
  - adhesives
  - aluminium trimmings, extrusions
  - moulded plastic or fibreglass, trimmings, extrusions
  - fillers
  - finishes
  - glass, plastic, perspex
  - mouldings
  - plastics
  - cleaning agents
  - solvents
  - polish
  - touch–up material

- foam, rubber, nylon sealants
- rivets, screws, nails, bolts, nuts, washers
- adhesive striping and decals.

# *Evidence Guide*

**Underpinning Skills and Knowledge:**

- To demonstrate competence, knowledge of and compliance with the Codes of Practice of the Recreational Vehicle Manufacturers Association of Australia (RVMAA) is required.
- Work activities must be carried-out in accordance with OH&S statutory and organisational policy and procedures.
- To demonstrate competence, evidence of skills and knowledge in the following areas is required:
  - design requirements for caravan manufacture
  - working drawings of components
  - instructions and specifications
  - correct and safe use of tools and equipment
  - components and products manufactured by the organisation
  - personal protective equipment
  - occupational health and safety regulations
  - general duty of care
  - welding
  - carpentry
  - sheet metal
  - use and care of portable power tools
  - planning and organisation of work
  - maintenance of the work area.

**Context of Assessment:**

- This unit can be assessed on or off the job. Assessment should include practical demonstration either in the workplace or within a simulated environment, with access to all necessary equipment and materials. This should be supported by a range of methods to assess underpinning knowledge.

**Critical Aspects of Assessment:**

- Evidence should include a demonstrated ability to:
  - complete work to specifications and plans
  - complete work to meet established timelines
  - comply with all occupational health and safety requirements
  - solve problems as they arise
  - rectify faults encountered
  - maintain a clean and tidy work place.

- Evidence of familiarity with organisation policies, processes and procedures is also required.

**Linkages to Other Units:**

- There is a link between this unit and others. Depending on the industry sector and workplace, combined assessment/training may be appropriate. For example:
  - THCMAN03A Construct and Install the Walls and Roof for a Recreational Vehicle.

| Key Competencies in this Unit | Level |
|---|---|
| Collecting, Organising and Analysing Information | 2 |
| Communicating Ideas and Information | 2 |
| Planning and Organising Activities | 2 |
| Working with Others and in Teams | 2 |
| Using Mathematical Ideas and Techniques | 2 |
| Solving Problems | 2 |
| Using Technology | - |

# *Unit THCMAN09A*
# *Build Furniture for a Recreational Vehicle*

**Unit Descriptor** This unit deals with the skills and knowledge necessary to construct furniture for installation within a recreational vehicle. This unit relates to National Furnishings Industry Competency Standard - Hard Stream #HS 14 and 15.

| | Element | Performance Criteria |
|---|---|---|
| 1 | **Plan and prepare the job** | • Product specifications are read and assessed.<br>• Accurate and concise information about components, parts and accessories is noted.<br>• Special instructions are noted. |
| 2 | **Prepare working drawings and/or set out rods** | • Design criteria is identified and correctly applied.<br>• Full size set-outs and set-out rods are produced within specified tolerances.<br>• Set-outs and set-out rods comply with specifications and organisational requirements.<br>• Components shown on set-outs are correctly labelled according to specifications.<br>• Prepared working drawings are accurate, precise and legible. |
| 3 | **Develop cutting lists for specified furniture** | • Cutting lists are developed to meet the requirements of the set-out or specification.<br>• Cutting lists are to comply with set outs or set-out rods.<br>• Measurements prescribed for each component are accurate, concise, recorded legibly and within specified tolerances.<br>• Quantities of each component are accurate and comply with set out rods. |
| 4 | **Organise materials for the job** | • Materials and finish required for components or products are identified, using working drawings.<br>• Components, parts and accessories are identified and labelled.<br>• Adhesives are selected in accordance with climatic conditions and the use recommended by the manufacturer.<br>• Materials are evaluated and selected for suitability and durability, according to job requirements.<br>• The movement of materials, components and equipment required for construction, is organised. |

| | | |
|---|---|---|
| | | • The quality of materials and equipment is monitored during transportation.<br>• Materials are safely positioned to meet construction purposes. |
| **5** | **Select machines and equipment** | • Machines and/or equipment to prepare specified components are correctly selected.<br>• Machines and/or equipment are set up in accordance with production objectives and manufacturer's instructions.<br>• All guards, guides and feeding devices are set in accordance with relevant statutory regulations.<br>• Safety and operational checks are performed in accordance with manufacturer's recommendations and relevant statutory requirements. |
| **6** | **Prepare furniture components** | • Components required for the job are produced, according to specified measurements, as stated on cutting lists.<br>• Jigs for specified furniture components are prepared and used where required.<br>• Machines and/or equipment is monitored for unusual sound, vibration, worn or damaged parts during production. |
| **7** | **Construct furniture** | • Safety hazards are identified.<br>• Processed furniture components are checked against the measurements specified on cutting lists.<br>• Furniture components are assembled.<br>• Assembled components are checked for accuracy, according to product set-outs.<br>• A final inspection is carried out to ensure all specifications have been met and required quality achieved. |

## *Range of Variables*

- The manufacturing organisation could include:
  - sole proprietor
  - sub-contractor
  - sub-contracting manufacturer
  - employer/manufacturer.

- Tools and equipment may include:
  - hand tools
  - powered static tools
  - powered portable tools
  - jigs
  - lifting equipment.

- Selected materials may include:
  - adhesives
  - aluminium
  - cardboard
  - fillers
  - finishers
  - flat boards, composites, ply wood etc.
  - glass
  - laminates
  - metals
  - mouldings
  - Plastics
  - solid timbers
  - veneers
  - vinyl, and other specified materials.

- Furniture components may include:
  - cupboards
  - benches
  - tables
  - frames
  - beds
  - bunks
  - mountings

- partitioning
- doors.

- Machines and equipment may include basic manually operated machines and equipment through to advanced machinery, fully automated and computerised machinery and/or equipment.

# *Evidence Guide*

**Underpinning Skills and Knowledge:**

- To demonstrate competence, knowledge of and compliance with the Codes of Practice of the Recreational Vehicle Manufacturers Association of Australia (RVMAA) is required.
- Work activities must be carried-out in accordance with OH&S statutory and organisational policy and procedures.
- To demonstrate competence, evidence of skills and knowledge in the following areas is required:
  - relevant statutory requirements applicable to the manufacture of furniture and fittings
  - working drawings of components manufactured by the organisation
  - instructions and specifications
  - correct and safe use of tools and equipment
  - components and products manufactured by the organisation
  - personal protective equipment
  - occupational health and safety regulations
  - general duty of care
  - carpentry
  - cabinetmaking
  - floorcovering
  - use and care of portable and fixed power tools
  - planning and organisation of work
  - maintenance of the work area.

**Context of Assessment:**

- This unit can be assessed on or off the job. Assessment should include practical demonstration either in the workplace or through close simulation, with access to all necessary equipment and materials. This should be supported by a range of methods to assess underpinning knowledge.

**Critical Aspects of Assessment:**

- Evidence should include a demonstrated ability to:
  - complete work to specifications and plans
  - complete work to meet established timelines
  - comply with all occupational health and safety requirements
  - solve problems as they arise
  - rectify faults encountered
  - maintain a clean and tidy work area.

- Evidence of familiarity with organisation policies, processes and procedures is also required.

**Linkages to Other Units:**

- There is a link between this unit and others. Depending on the industry sector and workplace, combined assessment/training may be appropriate. Examples may include but are not limited to:
  - THCMAN02A Build the Floor for a Recreational Vehicle
  - THCMAN03A Construct and Install the Walls for a Recreational Vehicle
  - THCMAN06A Install Furniture and Appliances in a Recreational Vehicle
  - MEM3.1AA Manual Production Assembly.

| Key Competencies in this Unit | Level |
|---|---|
| Collecting, Organising and Analysing Information | 2 |
| Communicating Ideas and Information | 1 |
| Planning and Organising Activities | 2 |
| Working with Others and in Teams | 1 |
| Using Mathematical Ideas and Techniques | 2 |
| Solving Problems | 2 |
| Using Technology | 1 |