

# Competency Standard

<b>UNIT TITLE:</b> OPERATE AND MAINTAIN A 4-WD VEHICLE IN SAFE WORKING CONDITION		<b>NOMINAL HOURS:</b> 60
<b>UNIT NUMBER:</b> D2.TTO.CL4.14		
<b>UNIT DESCRIPTOR:</b> This unit deals with skills and knowledge required to operate a <i>4-wheel drive</i> vehicle in a range of situations and provide for its basic maintenance while on tour		
<b>ELEMENTS AND PERFORMANCE CRITERIA</b>	<b>UNIT VARIABLE AND ASSESSMENT GUIDE</b>	
<p><b>Element 1: Operate a 4-wheel drive vehicle</b></p> <p><b>1.1</b> <i>Engage 4-wheel drive</i> correctly and when appropriate</p> <p><b>1.2</b> Drive <i>4-wheel drive vehicle</i> in a variety of <i>on-road conditions</i> and <i>off-road conditions</i></p> <p><b>1.3</b> Provide <i>safety and explanatory advice</i> to passengers</p> <p><b>1.4</b> <i>Ensure minimal environmental impact</i> when driving a 4-wheel drive vehicle</p> <p><b>1.5</b> Comply with road safety and road use rules and regulations</p> <p><b>Element 2: Recover a 4-wheel drive vehicle</b></p> <p><b>2.1</b> Use a variety of <i>techniques to recover 4-wheel drive vehicle</i> from bogged or trapped situations</p> <p><b>2.2</b> <i>Optimise safety for passengers and protection of property</i></p>	<p><b>Unit Variables</b></p> <p>The Unit Variables provide advice to interpret the scope and context of this unit of competence, allowing for differences between enterprises and workplaces. It relates to the unit as a whole and facilitates holistic assessment.</p> <p>This unit applies to staff who operate a 4-wheel drive vehicle in a range of situations and provide basic maintenance while on tour, within the labour divisions of the hotel and travel industries and may include:</p> <p>1. Tour Operation</p> <p><i>Engage 4-wheel drive</i> refers to:</p> <ul style="list-style-type: none"> <li>• Selecting and engaging the 4-wheel drive according to manufacturer’s instructions, including internal and external engagement</li> <li>• Selecting high or low range, or high or low model, depending on torque required</li> <li>• Selecting appropriate gear</li> <li>• Slowing or stopping to enable 4-wheel drive engagement, depending on vehicle type</li> <li>• Refraining from engaging optional 4-wheel drive on dry, hard, flat and firm surfaces</li> <li>• Protecting the safety of passengers and vehicle when engaging 4-wheel drive.</li> </ul>	

<p><b>2.3</b> Inspect vehicle after recovery and <i>perform necessary maintenance</i> and repairs before proceeding</p> <p><b>Element 3: Provide basic maintenance for a 4-wheel drive vehicle</b></p> <p><b>3.1</b> <i>Identify minor faults</i></p> <p><b>3.2</b> <i>Determine cause of faults</i></p> <p><b>3.3</b> <i>Conduct visual inspection of and operational tests on vehicle</i></p> <p><b>3.4</b> Effect <i>necessary repairs</i></p> <p><b>3.5</b> Effect <i>necessary preventative maintenance</i></p> <p><b>Element 4: Report on 4-wheel drive operations</b></p> <p><b>4.1</b> Complete <i>documentation</i> to record services and repair undertaken</p> <p><b>4.2</b> <i>Notify management</i> of issues that require external attention</p>	<p><i>4-wheel drive vehicle</i> may be:</p> <ul style="list-style-type: none"> <li>• Diesel or petrol powered</li> <li>• Made to manufacturer's instructions</li> <li>• Specially configured for touring conditions</li> <li>• Small capacity vehicles</li> <li>• Multi-seat units</li> <li>• Large or small coaches</li> <li>• Partial/part-time or permanent 4-wheel drive.</li> </ul> <p><i>On-road conditions</i> refer to <i>sealed roads</i> and may include:</p> <ul style="list-style-type: none"> <li>• Slippery conditions, including rain and ice</li> <li>• Steep terrain</li> <li>• Snow.</li> </ul> <p><i>Off-road conditions</i> refer to terrain that is not sealed and may include:</p> <ul style="list-style-type: none"> <li>• Steep inclines, including ascending and descending</li> <li>• Very soft ground</li> <li>• Rocky terrain</li> <li>• Sand</li> <li>• Water crossings</li> <li>• Mud.</li> </ul> <p><i>Safety and explanatory advice</i> may be related to:</p> <ul style="list-style-type: none"> <li>• Advising the use of seat belts</li> <li>• Advising passengers to stay inside vehicle, including arms, hands and heads</li> <li>• Explaining how 4-wheel drive transmission works</li> </ul>
--	---

- Stowing cargo appropriately, including re-packing cargo for off-road 4-wheel drive travel to attain a low centre of gravity

- Taking pressure out of tires.

*Ensure minimal environmental impact* should include:

- Adhering to designated tracks and routes in sensitive areas, parks or other prescribed areas
- Assessing quality of tracks or intended routes before travelling on them
- Minimising the effects of noise
- Ensuring all required permits (including payment of fees), authorities and advice have been obtained and understood
- Abiding by local prohibitions regarding entry by vehicles
- Being vigilant to avoid damaging habitats, property, signs and other permanent and/or natural assets
- Ensuring passengers do not litter the route and areas travelled
- Ensuring passengers do not remove flora and/or fauna from the area
- Not creating new tracks
- Using passing bays, where provided
- Leaving gates as they are found
- Removing obstructions on tracks as opposed to driving round them
- Not using trees as winch points if a recovery is required, or using tree protectors
- Allowing animals to have right of way
- Driving on beaches only on firm sand below high water marks.

*Techniques to recover 4-wheel drive vehicle* should relate to a variety of situations such as recovery from sand, mud, water and rocks, and may include:

- Deflation of tires before attempting to drive out
- Selecting low range/ratio and low gear
- Towing by another vehicle, including use of shackles, drag chains and snatch straps
- Winching, including use of vehicle winch (electric, PTO, hydraulic and capstan), hand-operated winch, pulley blocks, winch extension straps and tree protectors
- Using jacks, including kangaroo jack
- Using under-vehicle inflatable bags
- Using long handled shovel
- Using portable tracks and/or sand ladders
- Using front and rear recovery points.

*Optimise safety for passengers and protection of property* may include:

- Unloading items from the vehicle and removing to a safe and secure location
- Disembarking passengers
- Locating passengers at a safe distance (in a protected location) to avoid injury from flying parts that may occur during recovery.

*Perform necessary maintenance* will most commonly apply to recoveries from water immersion and may include:

- Checking no water in air intake
- Remove spark plugs, or injectors and turn engine over to remove water
- Replacing plugs, or injectors
- Applying water displacement products to dry out high and low tension electrical circuits, as appropriate

- Removing visible debris
- Re-aligning panel damage to enable free movement of wheels and steering
- Making note to have differential and transmission checked and/or serviced at nearest opportunity.

*Identify minor faults* may include:

- Talking with co-drivers to identify type and nature of fault, including symptoms and indicators, frequency/conditions under which fault occurs/presents
- Test driving vehicle to diagnose fault
- Running engine of stationary vehicle to diagnose fault.

*Determine cause of faults* may include:

- Referring to service and operator manuals
- Seeking advice from manufacturer, including over the phone assistance and radio communication
- Eliminating factors from the scenario that is causing the fault on a sequential and structured basis while continuing ongoing testing
- Referring to personal experience
- Loading vehicle onto jacks to facilitate inspections
- Use of applicable sensory appraisal, including sight, feel, smell and hearing
- Monitoring on-board gauges and instruments.

*Conduct visual inspection of and operational tests on vehicle* may include:

- Checking for leaks
- Checking condition of components, including hoses, belts, tires, filters, radiator
- Checking operation of indicators and lights
- Checking engagement point of brake pedal and clutch pedal

- Checking parking brake operation
  - Checking for noise and vehicle emissions
  - Inspecting battery.
- Necessary repairs* may include:
- Replacing, adjusting or servicing items identified as unserviceable as a result of visual inspection and operational tests
  - Topping up and/or replacing fluids
  - Repairing punctures
  - Bleeding brakes
  - Bleeding a diesel engine
  - Replacing plugs.
- Necessary preventative maintenance* will depend on the conditions in which the vehicle is being operated and may include:
- Undertaking scheduled service tasks as recommended by the manufacturer
  - Undertaking specified additional service tasks as required by the host enterprise
  - Replacing component parts
  - Draining and replacing fluids, including topping up of fluids
  - Preparing the vehicle for conditions that are anticipated, including water and sand.
- Documentation* may include:
- On-board service records and logs.
- Notify management* may include:
- Verbal notification, including face-to-face, over the telephone, or via radio communication
  - Completing maintenance requisition
  - Discussing the problem with specialists.

**Assessment Guide**

The following skills and knowledge must be assessed as part of this unit:

- The enterprise’s policies and procedures in regard to the operation and maintenance of 4-wheel drive vehicles
- Principles of safe road use including on-road and off-road applications
- Knowledge of host country legislated and other requirements in relation to the service and maintenance of commercial passenger vehicles
- Principles of diagnosing vehicle faults
- Ability to use basic repair and maintenance tools, equipment and techniques
- Ability to apply knowledge of standard and basic maintenance and repair procedures
- Knowledge of vehicle manufacturer’s instructions, specifications and recommended procedures for maintenance, trouble-shooting and repairs
- Knowledge of local road conditions
- Evidence of holding current and appropriate driver’s license for the vehicle that is being driven.

**Linkages To Other Units**

- Establish and maintain safe touring conditions
- Drive large tour buses or coaches
- Manage operational risk
- Maintain tourism vehicles in safe and clean operational condition
- Drive various types of service vehicles
- Operate tours in remote areas.

### **Critical Aspects of Assessment**

Evidence of the following is essential:

- Understanding of host enterprise policies and procedures in regard to the operation and maintenance of 4-wheel drive vehicles
- Understanding of the road rules and regulations of the host country and/or the road rules and regulations in which the 4-wheel drive vehicles are being driven
- Proof of holding a current and valid driver's license to suit the 4-wheel drive vehicle
- Demonstrated ability to perform required preventative maintenance and operational checks, as indicated on a supplied checklist, on a designated 4-wheel drive vehicle and provide written or verbal report on the condition of that vehicle
- Demonstrated ability to diagnose at least three simulated, minor and unidentified faults on a nominated 4-wheel drive vehicle
- Demonstrated ability to perform nominated and effective minor routine repairs to a designated 4-wheel drive vehicle in order to return the vehicle to a safe and effective operating condition
- Demonstrated ability to drive a nominated 4-wheel drive vehicle in prescribed conditions so as to display at least seven of the following skill sets:
  - Driving in sand
  - Driving in mud
  - Driving across rough terrain including rocky terrain
  - Driving up and down steep inclines
  - Driving through water
  - Starting the vehicle, including key start and application of choke and hand controls to govern speed/engine revolutions
  - Steering the vehicle and manoeuvring the vehicle, including uphill, downhill and on level ground
  - Using all vehicle controls, instruments and indicators, including foot and hand-operated controls

- Positioning and parking the vehicle
- Stopping the vehicle, including uphill, downhill and on level ground.

#### **Context of Assessment**

Assessment must ensure:

- Actual or simulated workplace application of vehicle maintenance and repair skills, and driving skills.

#### **Resource Implications**

Training and assessment must include the use of real vehicles, real tools and resources and a range of vehicles requiring a range of maintenance and repair provisions as well as the use of real vehicles in real or simulated driving conditions, situations and environments; and access to workplace standards, procedures, policies, guidelines, tools and equipment. Note: vehicle faults and problems may be simulated.

#### **Assessment Methods**

The following methods may be used to assess competency for this unit:

- Observation of practical candidate performance
- Portfolio of documents providing evidence of vehicle inspections, service, and repairs
- Oral and written questions
- Third party reports completed by a supervisor
- Project and assignment work.

<b>Key Competencies in this Unit</b>		
<i>Level 1 = competence to undertake tasks effectively</i>		
<i>Level 2 = competence to manage tasks</i>		
<i>Level 3 = competence to use concepts for evaluating</i>		
<b>Key Competencies</b>	<b>Level</b>	<b>Examples</b>
Collecting, organising and analysing information	2	Check vehicles for faults and damage
Communicating ideas and information	1	Convey safety information to passengers
Planning and organising activities	1	Schedule vehicle serving; plan the best route to take given conditions that apply at the time
Working with others and in teams	1	Drive safely and courteously with other road users; use passengers to assist in vehicle recovery
Using mathematical ideas and techniques	1	Calculate quantities/volumes of fluids, air and other resources needed to service and repair vehicles
Solving problems	2	Identify and diagnose faults
Using technology	2	Drive vehicles and use on-board communication equipment; use servicing tools and equipment