

Assessment

Unit standard 15163

Version 6

Level 3

Credit 5



Drive a large passenger service vehicle in a fuel efficient manner

Learner name:

MITO ID number:

Workplace supervisor:

Name of business:

Contact phone number:

Learner declaration – pre-assessment

I understand how this assessment will be carried out and what I have to do.

Learner signature: Date:

Assessment outcome

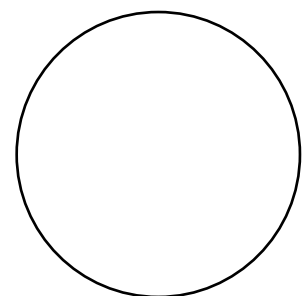
Assessment decision: ☐ Achieved ☐ Not Yet
Achieved

Assessor name:

Assessor signature:

Assessor stamp number:

Assessment date:



Assessor stamp

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Introduction

This assessment covers the following unit standard.

Unit standard	Title	Version	Level	Credit
15163	Drive a large passenger service vehicle in a fuel efficient manner	6	3	5

Assessment tasks

There are **two** tasks in this assessment. You **must** complete:

- Task 1 – Describe factors that affect the fuel efficiency of large passenger service vehicles
- Task 2 – Drive a large passenger service vehicle to optimise fuel efficiency.

You **must** make sure the Workplace verifier declaration is completed.

What you should do

Step 1 Read the assessment information and the instructions for each task.

Step 2 Answer the questions in Tasks 1.

Step 3 Sign the Learner declaration at the end of the assessment.

Step 4 Give your completed assessment to your assessor.

Step 5 Make sure your workplace verifier fills out and signs the form in Task 2.

Once you have signed the Learner declaration at the end of the assessment, give it to your assessor.

Make a copy of your work and save it. We encourage you to take photos as supporting evidence for any discussion points in the practical tasks.

Assessment conditions

This is a theory and practical assessment.

If you need more space for your answers, you can write or type your answers on extra sheets of A4 paper. Write your name and MITO ID number on **each** sheet, and clearly identify which question each answer relates to. Attach the extra sheets to the back of this assessment booklet.

Plagiarism

Your answers **must** be your own work. If you are found to have copied someone else's answers, you may not achieve credit for the unit standard.

Reassessment

If you receive a Not Yet Achieved (NYA) result, your assessor will give you feedback on your answer. The feedback will tell you what you need to do to pass your assessment. You might need to give more evidence, and/or you might need to learn more about the subject.

Appeals procedure

If you don't agree with the result of this assessment, talk to your assessor about it.

If you still disagree, you can talk to MITO's Assessment and Moderation team by calling 0800 88 21 21.

If the issue is not resolved, you can make a formal appeal to MITO. You **must** send the appeal to MITO within 20 working days from when you received the result. The email address is assessment.appeals@mito.org.nz.

Feedback

If you have feedback on the tasks or questions in this assessment or the way it is structured, email resourcecomments@mito.org.nz.

Prerequisites

Before starting this assessment, learners **must**:

- Before starting this assessment, learners are recommended to hold unit standard 15158, *Carry out pre-start vehicle checks on a heavy motor vehicle, prepare vehicle for use, and shut it down*.

Unit standard explanatory notes

- 1 Legislation relevant to this unit standard includes:
Land Transport Act 1998;
Land Transport (Driver Licensing) Rule 1999;
Land Transport (Road User) Rule 2004;
Land Transport Rule: Passenger Service Vehicles 1999;
Land Transport Rule: Work Time and Logbooks 2007.
- 2 Any new, amended or replacement Acts, regulations, Rules, standards, codes of practice, or NZ Transport Agency requirements or conditions affecting this unit standard will take precedence for assessment purposes, pending review of this unit standard.
- 3 Definitions
Driving conditions are road, traffic, vehicle, driver, weather, and light. A driver's reactions will always be to potential hazards arising from these six conditions.
Large passenger service vehicle means any passenger service vehicle that is designed or adapted to carry more than 12 persons (including the driver). For the purposes of this unit standard, it also includes any passenger service vehicle over 3500kg that carries less than 12 passengers because its configuration has been adapted to carry passengers in wheelchairs.
System of vehicle control means placing the vehicle in the correct place on the road, at the right speed and in the right gear in all driving situations, but particularly when approaching and negotiating hazards.
- 4 This unit standard does not apply to electrically powered vehicles.
- 5 People who drive passenger service vehicles on a road for hire or reward or a large passenger service vehicle (regardless of hire and reward) must hold a full driver licence appropriate to the vehicle driven and have a Passenger (P) licence endorsement as required by the Land Transport (Driver Licensing) Rule 1999.

Task 1 – Describe factors that affect the fuel efficiency of large passenger service vehicles

Question 1

In your own words, describe what the term ‘fuel efficiency’ means?

Question 2

Inertia is defined as ‘the tendency of an object to resist a change in its state of motion’. In other words, things don’t move unless something makes them. Heavy objects like buses have a lot of inertia.

Why does having lots of inertia **negatively affect** bus fuel efficiency?

Question 3

Friction between the bus tyres and the road helps control the vehicle but also slows it down. This is known as rolling resistance.

a) Explain how inflated tyres affect **rolling resistance**

b) How does rolling resistance affect a vehicles **fuel efficiency**?

Question 4

Aerodynamic resistance increases with surface area. Why is this detrimental to bus fuel efficiency?

Question 5

a) Define **grade resistance**

b) Explain how grade resistance affects bus **fuel efficiency**?

Question 6

Describe how vehicle speed affects **fuel efficiency**.

Question 7

Describe the relationship between vehicle **mass** (weight) and fuel efficiency.

Question 8

Explain the relationship between torque, power, and engine speed in terms of fuel efficiency for large passenger service vehicles.

Question 9

Different transmission types can have an effect on fuel efficiency. What are **two** advantages and disadvantages of manual and automated transmissions?

Transmission	Advantages	Disadvantages
Manual 1		
Manual 2		
Automated 1		
Automated 2		

Question 10

a) Use the following terms to help you describe how an electronic fuel management system works.

- Electronic Control Unit (ECU)
 - Ignition timing
 - Input sensors
 - Fuel injectors
-
-

b) How does this system help conserve fuel?

Question 11

Checking and maintaining the condition of your bus is one of the easiest ways of keeping it fuel efficient. Give **one** reason why each of these maintenance strategies can help save fuel.

Reporting faults

On road spot checks

Regular servicing

Pre-/post-trip inspections

Question 12

Fuel efficiency is as much about the driver as it is the vehicle. How could **each** of these driving behaviours affect fuel efficiency?

Attitude

Experience, knowledge and skills

Fatigue

Drugs and alcohol

Illness and injury

Task 2 – Drive a large passenger service vehicle to optimise fuel efficiency

Learner instructions

In this practical assessment, you need to demonstrate how you use fuel efficient driving techniques confidently and consistently during a 40-minute continuous drive. You will be tasked with driving on a combination of urban roads and a motorway or highway.

You will be assessed on your:

- use of fuel-efficient driving strategies
- engine speed and transmission use
- use of cruise control (where applicable)

Your assessor will observe you as you drive and record their observations and comments in the checklist provided.

During the assessment, your assessor may ask you to explain your actions, or additional questions to assess your knowledge of the activities you carry out. You must answer all the assessor's questions.

Note: you **must** hold a class appropriate licence for the vehicle you will be driving. You must conduct all actions safely and in accordance with the Land Transport (Road User) Rule 2004

Assessor instructions

You must complete the observation checklist overleaf, placing a tick (✓) indicating Achieved or cross (X) indicating Not yet Achieved (NYA) in each box as the learner completes the task. If an activity is not applicable, for example, use of cruise control where a vehicle does not have it, indicate this with an (N/A) in the comments field and leave the checkbox blank.

Ask the learner appropriate questions as they carry out each activity, for example 'What do you see and what are you doing about it?' and record learner responses. Give appropriate instructions such as 'Turn right at the next intersection'.

The assessment is a practical activity and ideally evidence for tasks should come from naturally occurring events where possible. If the learner doesn't encounter conditions relevant to the activity, then you should ask additional open questions designed to determine the learner's knowledge at the end of each task. Record their answers in the relevant Verifier notes section at the end of each task. Within the 'Criteria/Additional assessor comment' column, pay attention to the way the statements are worded.

Where statements similar to '**may** include' or '**may be required**' are mentioned, consider this additional guidance that expands upon the performance criteria.

Where statements similar to '**must** include' are mentioned, consider these requirements

essential to achieving the unit standard. Feedback specific to each performance criteria may also be recorded in this column while the assessment takes place and then collated in the relevant comment section at the end of each task

Assessor to complete on day of assessment.

Drive details	
Date::	Location:
Drivers licence #:	
Vehicle make, model and transmission type:	
Route details:	
Start time:	Finish time:

Assessor to complete on day of assessment

The learner has completed the US 15158 Carry out pre-start vehicle checks on a heavy motor vehicle, prepare vehicle for use, and shut it down. ☐

Activity 1 – Drive a light motor vehicle to optimise fuel efficiency		
Evidence of achievement	Achieved: (✓) NYA: (X)	Criteria/Additional assessor comment
The learner drives to conditions that are continually monitored to enable the driver to implement optimum fuel efficient driving strategies.	<input type="checkbox"/>	<ul style="list-style-type: none"> • The learner must conduct all actions safely and in accordance with the Land Transport (Road User) Rule 2004. • The learner should drive at a speed appropriate to conditions, never above what is required. • Range strategies include – <ul style="list-style-type: none"> <input type="checkbox"/> use of momentum, <input type="checkbox"/> throttle control, <input type="checkbox"/> system of vehicle control, <input type="checkbox"/> lane use, <input type="checkbox"/> not overtaking unnecessarily, <input type="checkbox"/> maintaining correct following distances, <input type="checkbox"/> avoiding excessive speed, <input type="checkbox"/> allowing the engine to pull back into the lower end of the operating or economy range, <input type="checkbox"/> cornering techniques, <input type="checkbox"/> grade techniques.

<p>The learner manages engine speed and transmission use to optimise fuel efficiency and safe vehicle operation.</p>	<input type="checkbox"/>	<p>Range may include –</p> <ul style="list-style-type: none"> <input type="checkbox"/> tachometer use, <input type="checkbox"/> throttle use, <input type="checkbox"/> avoidance of excessive idle times, <input type="checkbox"/> avoidance of unnecessary downshifting when slowing and stopping, <input type="checkbox"/> achieving highest gear possible as soon as possible, <input type="checkbox"/> maintaining the highest possible gear, <input type="checkbox"/> using auxiliary brakes or compression to minimise service brake use; <input type="checkbox"/> for manual or automated buses with stick shift may include – progressive shifting, skip/block shifting
<p>The learner uses cruise control to improve fuel efficiency.</p>	<input type="checkbox"/>	<p>Where fitted, and where driving conditions permit.</p>
<p>Activity 1 – Verifier notes (e.g. discussion points, oral questions and answers):</p>		
Empty space for verifier notes		

Learner declaration

I have completed the tasks in this assessment, and I confirm that the evidence I have presented is my own work.

Learner name: _____

MITO ID number: _____

Learner signature: _____

Date: _____

Workplace verifier declaration

Learner name _____

I have observed the learner as they completed these tasks in the workplace. I have viewed their evidence, and I can confirm the following.

[illegible]

Verifier name _____

Verifier signature _____

Verifier job title _____

Contact phone number _____ Date ____/____/____

[illegible]

Assessment summary and results

Unit standard ID/outcome or element number	Title and element/outcomes	Assessment method	Achieved / Not Yet Achieved (A/NYA)
US 15163 (version 6)	Drive a large passenger service vehicle in a fuel efficient manner		
1	Describe factors that affect the fuel efficiency of large passenger service vehicles.	Task 1, Q 1-12	
2	Drive a large passenger service vehicle to optimise fuel efficiency. Range a continuous drive of at least 40 minutes that includes driving on rural or urban roads and a motorway or highway.	Task 2 Practical	
Overall result			

Assessor: Record the learner's overall result on the front of this assessment booklet.

Learner name: _____

Date assessment completed: _____ / _____ / _____



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