VEHICLE TECHNICIAN ACCREDITATION ASSESSMENT

TRAINER GUIDE

January 2020
Issue 1

Contents

Overview Document

The purpose of this document is to provide information which will enable training providers to guarantee that they have the correct resources to successfully deliver the Vehicle Technician Accredited Assessment. In addition to this, it is a useful point of reference when answering queries from prospective candidates that wish to complete the assessment.

The SEG Awards qualification code is U0008.
The date of this specification is January 2020. The issue number is 1.

Introduction

The SEG Awards Vehicle Technician Accredited Assessment (VTAA) has been developed in collaboration with the Driver and Vehicle Standards Agency (DVSA).
Achievement of the VTAA enables Motor Vehicle Technicians who do not hold a formal qualification and who have worked in their roles for four or more years to prove their capabilities at Level 3. Achievement enables a technician to meet the entry requirements to become a Tester for class 3, 4, 5 or 7 vehicles. Gaining status as an MOT Tester will be subject to DVSA requirements. The DVSA can withdraw Tester Status if conditions are not met.
The SEG Awards VTAA is a lifetime achievement, which means that it will not expire, and holders will be considered professionally competent for the rest of their lives.
The VTAA is available to be delivered and assessed as a complete accreditation or as individual modules contributing to a full accreditation.

General Information

Aims

The SEG Awards Vehicle Technician Accredited Assessment aims to:

- show technicians have the knowledge and skills expected of someone working at Level 3
- enable technicians without a Level 3 qualification to enroll on MOT Tester qualifications in order for them to become qualified to conduct MOTs
- show that a technician meets the Motor Vehicle Level 3 National Occupational Standards.

Where a learner has not completed all of the required units as part of the VTAA course, learners/Training Providers cannot add separate unit accreditations from the VTAA Modular course in order to claim a VTAA certificate.

Target Group

The SEG Awards Vehicle Technician Accredited Assessment acts as an equivalent accreditation for Technicians who wish to gain the DVSA Certificate of Competence for MOT Testers but have no formal Level 3 Motor Vehicle qualification. All of the content within the assessments has been mapped to the Level 3 Light Vehicle National Occupational Standards.

Entry Requirements

There are no formal requirements for entry to the VTAA however as the VTAA is assessment of a motor vehicle technician's knowledge and skills it is expected that motor vehicle technicians will have worked in their roles for four or more years to demonstrate capabilities at Level 3. Evidence to demonstrate four years' experience could be provided through items such as former wage slips/ technician declaration or CV. This list is not exhaustive. SEG Awards expects centres to recruit with integrity.

Progression Opportunities

The VTAA is a requirement for technicians without a Level 3 qualification who wish gain entry on to the SEG Awards MOT Tester Qualification

- Level 2 Award in MOT Testing (Classes 4 and 7) (601/8935/6)

Reasonable Adjustments

Adjustments to assessment arrangements are made on the basis of the individual needs of candidates. Technicians must be told that if they are planning to progress to the Level 2 Awards in MOT Testing then reasonable adjustments are restricted within those qualifications. Level 2 Awards in MOT Testing (Class 1 and 2) and Level 2 Awards in MOT Testing (Class 4 and 7) do not allow readers or scribes for the assessment.

Resource Requirements

The assessment requires a Technician to complete practical tasks and online test(s). To provide the assessment, trainers and technicians will need to be able to access the following:

Online knowledge tests

- access to IT equipment with BTL secure client installed
- test environment that meets the requirements
- invigilators

- Practical tasks
  - well-lit workshop area
  - vehicles, rigs, electric circuits appropriate to the task
  - workshop tools and equipment
  - PPE

  Detail of the resource requirements for each practical task is given in Appendix 2

- SEG Awards support resources. These resources are available, from SEG Awards' secure on-line registration system (ORS), in a document entitled 'Vehicle Technician Accredited Assessment (VTAA) Practical Tasks Resources'. The resources support the following practical tasks

Module	Task ID	Task Title
Suspension, Steering Wheels and Tyres	Sus – 01	Tyre Wear
Electrical	Ele - 09	Oscilloscope Waveform ID
Emissions	Emi - 03	Emission Test Sample

Trainer/Assessor Requirements

Trainer Requirements

Training Providers must have trainers with sufficient knowledge and skills in the subject matter being delivered. Trainers must have achieved a Level 3 Motor Vehicle related qualification or any other equivalent accreditation.

Assessor Requirements

Assessors are responsible for the validity, reliability and authenticity of evidence. Assessors therefore need to have a thorough understanding of assessment and quality assurance processes, as well as having an in-depth technical competence relating to the VTAA practical skills.

Internal Quality Assurer Requirements

The primary responsibility of the IQA is to assure the quality and consistency of assessments by the assessors for whom they are responsible. IQAs therefore need to have a thorough understanding of quality assurance and assessment practices, as well as technical competence related to the VTAA that they are internally quality assuring.

IQAs will be responsible for, and accountable for consistency, quality and reliability of evidence and assessors.

It will be the responsibility of the approved centre to select and appoint IQAs.

To be an approved IQA, the person must:

- have in-depth knowledge of the VTAA requirements
- be occupationally aware of the Motor Vehicle sector
- be approved by SEG Awards to carry out internal quality assurance for the SEG Awards Vehicle Technician Accredited Assessment
- demonstrate knowledge and understanding of the quality assurance processes required by the centre and SEG Awards

Approval of IQAs can be removed. IQAs cannot verify the VTAA if they are not approved by, or have had their approval removed.

Assessment Structure and Content

Centres must use the assessments set by SEG Awards.

Structure

There are two options for completing the VTAA:

- Complete assessment (**U0008** Vehicle Technician Accredited Assessment)

Area	Complete Assessment U0008 VTAA	
	Practical Assessments	**Online Test**
Brakes	4 tasks	50 MCQs*
Suspension	4 tasks	
Steering, Wheels & Tyres		
Emissions	4 tasks	
Electrics	4 tasks	

*MCQs = Multiple Choice Questions

Assessment Overview

The emphasis of SEG Awards Vehicle Technician Accredited Assessment is to assess that a Technician has the required level of practical skills and knowledge that is needed in order to meet the pre-requisites for MOT Testing.

To complete the VTAA, technicians will need to complete practical assessments in each of the following areas:

- brakes
- suspension, Steering, Wheels and Tyres
- emissions
- electrics

In total, a technician will complete 4 practical tasks for **each** area. Each SEG Awards-devised practical task will take 10 minutes to complete. Each practical task has its own resource documents which include

- guidance and instruction for setting the task up
- a marking sheet to be completed and submitted to SEG Awards once all the practical assessments have been completed.

Technicians will also need to complete an online knowledge assessment consisting of 10 questions for **each** of the following areas:

- brakes
- suspension
- steering, Wheels and Tyres
- emissions
- electrics

The online test presents multiple choice questions for each area. There are 50 questions in total. Technicians must score 60% overall. The duration of the test is 75 minutes.

Practical Tasks

Within each module, the practical tasks have been grouped into 4 sub-groups. The technician **must** successfully complete 1 task from each sub-group. Details of the subgroups are given on the next page.

Technicians must meet all of the requirements set in each task to pass the assessment. Each task has 2 resource documents. The first document is for

the trainer and provides guidance and instructions on how to set up the task. The second document is for the technician. This document explains what they need to do for each task. The technician will use this document to record their responses to the task.

Sub-Group	**Suspension, Steering, Wheels & Tyres** Technician must complete 1 task from **each** sub-group, totally 4 tasks	**Brakes** Technician must complete 1 task from **each** sub-group, totally 4 tasks	**Emissions** Technician must complete 1 task from **each** sub-group, totally 4 tasks	**Electrical** Technician must complete 1 task from **each** sub-group, totally 4 tasks
A	Tyre Wear	Disc Measurement	Live Data – Analyse Data	Electrical wiring fault (1)
B	Inspection of vehicle front suspension (1)	Brake servo	Emission tester	Resistance check
	Inspection of vehicle front suspension (2)	ABS Fault (1)	Emission test sample	Circuit produce – relay
	Steering	ABS Fault (2)	Petrol injector fault	Circuit relay fault
C	Anti-roll bar links/bushes	Brake fluid	O2 Sensor – Data (1)	Fault code diagnosis
	Inspection of vehicle rear suspension	Brake pipe fabrication	O2 Sensor – Data (2)	CAN network fault
	Suspension component inspection	Brake pipe/hosepipe inspection	Scan tool data	Electrical wiring fault (2)
D	Steering mechanism – Vague steering	Disc caliper	Fuel system	Oscilloscope measurement
	Steering mechanism – Stiff steering	Handbrake – Not functioning	Engine non-start (1)	Oscilloscope waveform ID
	Steering mechanism check	Drum brake inefficient	Engine non-start (2)	Wiring diagram identification

External Quality Assurance

SEG Awards will carry out periodic audit inspections on centres approved to deliver the Vehicle Technician Accredited Assessment. This will be to ensure that the integrity of the assessments are upheld and that centres have the relevant processes and procedures in place.

Audit Inspection

An SEG Awards auditor will contact the Centre to arrange a date for an initial inspection. Centres will agree a date with the Auditor. The agreed date needs to be on a day when assessments are taking place.

The VTAA self-declaration form will be validated at the audit. If the audit identifies any issues with processes, procedures and/or resources then approval and certification may be withdrawn.

The audit report will be sent to SEG Awards by the auditor. If any compliance issues are identified then these will be referred to the SEG Awards Compliance team.

After the initial inspection all approved centres will be subject an annual audit. Additional or earlier audits will be carried out where centres have 150+ registrations in a year.

Please Note

- SEG Awards expects that a practical assessment and/or an online assessment are taking place on the agreed audit date.
- Failure to advise the auditor of changes before the audit date could result in certification being put on hold until SEG Awards is confident that all assessment standards are being complied with.
- If the auditor does not observe a practical assessment or an online assessment on the date agreed an additional audit will be arranged and a charge of £300 will be applicable.

Appendix 1: Practical Tasks

Practical Tasks

For each module, candidates should successfully complete one practical task from each sub-group.

Suspension, Steering, Wheels & Tyres: Sub-Group A

Sub-Group	**Suspension, Steering, Wheels & Tyres** Technician must complete 1 task from **each** sub-group
A	Tyre Wear
B	Inspection of vehicle front suspension (1)
	Inspection of vehicle front suspension (2)
	Steering
C	Anti-roll bar links/bushes
	Inspection of vehicle rear suspension
	Suspension component inspection
D	Steering mechanism – Vague steering
	Steering mechanism – Stiff steering
	Steering mechanism check

Trainer Guidance: Suspension, Steering, Wheels & Tyres 01

Module	Suspension, Steering, Wheels & Tyres
Task	Sus – 01
Task Title	Tyre Wear
Time – mins	10
NOS ref	IMILV08/13

Technician Instructions - Section 1	You are asked to inspect two physical wheel / tyre assemblies that were fitted to the front of a vehicle (O/S/F & N/S/F). Identify the following specification / condition on the tyres and any faults to their vehicle fitment according to their vehicle location.
	O/S/F tyre size ……. …….
	O/S/F wheel / tyre tread depth: Inner …….mm: centre …….mm: outer ……mm
	O/S/F wheel / tyre assembly fault(s) …… …….
	N/S/F tyre size…….. …….
	N/S/F wheel / tyre tread depth: Inner …….mm: centre …….mm: outer ……mm
	N/S/F wheel / tyre assembly fault(s)…….. …….
Section 1 Conclusion	Identify the symptom that the driver would experience with the tyre wear / fault(s) of the wheels / tyre assemblies inspected: …….

Technician Instructions- Section 2	Identify the various tyre wear characteristics by the illustrations provided. Put your answers in the boxes below:
A	
B	
C	
Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.

Set up of task	• Two physical wheel assemblies that would cause the vehicle to pull in one direction as identified by the drivers' symptom (i.e. diameter/aspect ratio/tyre construction). • Illustration of 3 different tyre wear characteristics (selected from the options indicated) to be laid out to the Technician. • Laminate the illustrations make up a document set. • Clearly identify on 'each' illustration the letter.

Vehicle/rig/other	• No vehicle or rig needed
Tools and equipment list	• Two physical wheel / tyre assemblies • Illustrations laminated and labelled • Technician marking sheet

Marking of task

Correct answers	Physical tyre with the following faults:	Incorrect tyre size between OS & NS tyre (could be written on the tyre wall)
Physical tyres	Physical tyre tread depth (+/- 1mm) to OS & NS	

Illustrations		Answers: 1. Under inflation 2. Over inflation 3. Normal tyre wear 4. Toe out – excessive negative camber 5. Toe in – excessive positive camber
A	PICTURE REQUIRED	
B	PICTURE REQUIRED	
C	PICTURE REQUIRED	

Required to pass task
100%

Module	Suspension, Steering, Wheels & Tyres
Task	Sus – 01
Task Title	Tyre Wear
Time - mins	10 Minutes

Technician Instructions - Section 1	You are asked to inspect two physical wheel / tyre assemblies that were fitted to the front of a vehicle (O/S/F & N/S/F). Identify the following specification / condition on the tyres and any faults to their vehicle fitment according to their vehicle location	**OFFICIAL USE ONLY**
	O/S/F tyre size: …….	
	O/S/F wheel / tyre tread depth: Inner …….mm: Centre …….mm: Outer ……mm	
	O/S/F wheel / tyre assembly fault(s)…… ……	
	N/S/F tyre size: …..…….	
	N/S/F wheel / tyre tread depth: Inner …….mm: Centre …….mm: Outer ……mm	
	N/S/F wheel / tyre assembly fault(s)……. ……	
Section 1 Conclusion	Identify the symptom that the driver would experience with the tyre wear / fault(s) of the wheels / tyre assemblies inspected: ……..	
Technician Instructions - Section 2	Identify the various tyre wear characteristics by the illustrations provided. Put your answers in the boxes below:	
	Image :	
	Image :	
	Image :	
Assessor signature		
Date of Completion		

Technician Name:

Date:

Suspension, Steering, Wheels & Tyres: Sub-Group B

Sub-Group	**Suspension, Steering, Wheels & Tyres** Technician must complete 1 task from **each** sub-group
A	Tyre Wear
B	Inspection of vehicle front suspension (1)
	Inspection of vehicle front suspension (2)
	Steering
C	Anti-roll bar links/bushes
	Inspection of vehicle rear suspension
	Suspension component inspection
D	Steering mechanism – Vague steering
	Steering mechanism – Stiff steering
	Steering mechanism check

Trainer Guidance: Suspension, Steering, Wheels & Tyres 02

Module	Suspension, Steering, Wheels & Tyres
Task	Sus – 02
Task Title	Inspection of Vehicle Front Suspension (1)
Time – mins	10
NOS ref	IMILV08

Technician Instructions	You have been asked to check the vehicle front suspension for wear to its components. Check the vehicle suspension to OS/NS (as indicated by your assessor) and identify suspension component(s) fitted that have excessive wear and make any suitable recommendations using the document(s) provided. The following suspension component(s) have excessive wear:
A	
B	
C	

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.

Vehicle/rig/other	• Vehicle
Tools and equipment list	• Selection of levers - suitable to achieve the outcome of the task • Selection of hand tools to suit task • Clipboard • Inspection lamp • PPE

Marking of task

Correct answers	Correct identification of suspension top mount excessive movement
	Correct use of hand tools
	Correct safe working practices
	Correct PPE used for the replacement of component

Required to pass task
100%

Set up of task	• Suspension type: Front semi strut/McPherson strut. • Vehicle - Front of vehicle not raised and situated on turn plates and capable of being raised. • Wheel securely fastened to hub assembly of suspension. • Suspension top mount excessive play (more than the recommended play), which may require the top mount to be modified to suit the task.

Module Suspension, Steering, Wheels & Tyres
Task Sus - 02
Task Title Inspection of Vehicle Front Suspension (1)
Time - mins 10 min

Technician Instructions	You have been asked to check the vehicle front suspension for wear to its components. Check the vehicle suspension to OS/NS (as indicated by your assessor) and identify suspension component(s) fitted that have excessive wear and make any suitable recommendations using the document(s) provided. The following suspension component(s) have excessive wear:	**OFFICIAL USE ONLY**
	A:	
	B:	
	C:	
	Use of hand tools – OFFICE USE ONLY	
	Safe working practices – OFFICE USE ONLY	
	PPE used – OFFICE USE ONLY	
Assessor signature		
Date of Completion		

Technician Name:

Date:

Trainer Guidance: Suspension, Steering, Wheels & Tyres 03

Module	Suspension, Steering, Wheels & Tyres
Task	Sus – 03
Task Title	Inspection of Vehicle Front Suspension (2)
Time – mins	10
NOS ref	IMILV08

Technician Instructions	You have been asked to check the vehicle front suspension for wear to its components. Raise the front of the vehicle to allow the OS & NS suspension to be checked in a manner to which would allow the various components checked correctly. The following suspension ball joint(s) indicate wear:
OS lower:	
NS lower:	
OS upper:	
NS upper:	

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.

Set up of task	• Vehicle to be situated on a four post lift. • Jacking beam capable of raising the vehicle to check the front suspension of the vehicle type chosen. • One OS or NS ball joint (upper or lower) to display excessive play.

Vehicle/rig/other	• Vehicle with front wishbone type suspension only can be used on this task.
Tools and equipment list	• Selection of levers – suitable to achieve the outcome of the task • Selection of hand tools to suit task • Clipboard • Inspection lamp • PPE

Marking of task

Correct answers	Correct raising of the vehicle to check suspension ball joint(s).
	Correct ID of ball joint with excessive play.
	Correct use of hand tools.
	Correct safe working practices.
	Correct PPE used for the task.

Required to pass task
100%

Module	Suspension, Steering, Wheels & Tyres
Task	Sus - 03
Task Title	Inspection of Vehicle Front Suspension (2)
Time - mins	10 Minutes

Technician Instructions	You have been asked to check the vehicle front suspension for wear to its components. Raise the front of the vehicle to allow the OS & NS suspension to be checked in a manner to which would allow the various components checked correctly. The following suspension ball joint(s) indicate wear:	**OFFICIAL USE ONLY**
	OS lower:	
	NS lower:	
	OS upper:	
	NS upper:	
	Correct raising of the vehicle – OFFICE USE ONLY	
	Use of hand tools – OFFICE USE ONLY	
	Safe working practices – OFFICE USE ONLY	
	PPE used for task – OFFICE USE ONLY	
Assessor signature		
Date of Completion		

Technician Name:

Date:

Trainer Guidance: Suspension, Steering, Wheels & Tyres 04

Module	Suspension, Steering, Wheels & Tyres
Task	Sus – 04
Task Title	Steering
Time – mins	10
NOS ref	IMILV08/13

Technician Instructions	You have been asked to check the steering of a vehicle, the driver has complained of an unusual noise whilst the steering wheel is being turned report the fault, and the reason that the fault occurred.
The fault with the steering mechanism was:	
The reason for the fault was:	

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.
Set up of task	• Vehicle fitted with 'hydraulic' PAS. • Drain fluid from reservoir leaving a small amount of fluid in reservoir / alternatively restrict the amount of fluid entering the pump through the filter. • Allow easy access to the reservoir. • Vehicle to be set up on a four post ramp, vehicle to be positioned on swivel plates that are fitted to the ramp and used for this assessment, ensure that these are in the unlocked position. • Loosen of PAS pipe from rack / box to create a leak

	• Ramp to be fitted / not fitted with jacking beam

Vehicle/rig/other	• Vehicle
Tools and equipment list	• Selection of hand tools to suit task • Clipboard • Inspection lamp and well-lit area of workshop • PPE

Marking of task

Correct answers	Correct identification of PAS fluid excessively low.
	Correct identification of PAS fluid leak from steering rack/box.
	Correct safe working practices.
	Correct PPE used for the task.

Required to pass task
100%

Module	Suspension, Steering, Wheels & Tyres
Task	Sus - 04
Task Title	Steering
Time - mins	10 Minutes

Technician Instructions	You have been asked to check the steering of a vehicle, the driver has complained of an unusual noise whilst the steering wheel is being turned report the fault, and the reason that the fault occurred.	**OFFICIAL USE ONLY**
	The fault with the steering mechanism was:	
	The reason for the fault was:	
	Safe working practices – OFFICE USE ONLY	
	PPE used for task – OFFICE USE ONLY	
Assessor signature		
Date of Completion		

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.	

Technician Name:

Date:

Suspension, Steering, Wheels & Tyres: Sub-Group C

Sub-Group	**Suspension, Steering, Wheels & Tyres** Technician must complete 1 task from **each** sub-group
A	Tyre Wear
B	Inspection of vehicle front suspension (1)
	Inspection of vehicle front suspension (2)
	Steering
C	Anti-roll bar links/bushes
	Inspection of vehicle rear suspension
	Suspension component inspection
D	Steering mechanism – Vague steering
	Steering mechanism – Stiff steering
	Steering mechanism check

Trainer Guidance: Suspension, Steering, Wheels & Tyres 05

Module	Suspension, Steering, Wheels & Tyres
Task	Sus – 05
Task Title	Anti-roll bar links / brushes
Time – mins	10
NOS ref	IMILV01

Technician Instructions	Please inspect the antiroll bar (as identified by your assessor) and its associated components. Identify any faults that you observe. List the fault(s) associated the components.
A	
B	
C	

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.

Set up of task	Vehicle to be set up on 2/4 post ramp or pit. One of the following faults to be set up on the vehicle: • Heat applied to the roll bar / roll bar link to suspension • D bush missing from anti roll bar clamp • Excessive play to the D bush

Vehicle/rig/other	• Vehicle only
Tools and equipment list	• Clipboard • Inspection lamp • PPE

Marking of task

Correct answers	Correct ID of anti-roll bar fault heat applied to roll bar components.
	Correct ID of anti-roll bar D bush missing from clamp.

Required to pass task
100%

Module	Suspension, Steering, Wheels & Tyres
Task	Sus - 05
Task Title	Anti-roll bar links / bushes
Time - mins	10 Minutes

Technician Instructions	Please inspect the anti-roll bar (as identified by your assessor) and its associated components. Identify any faults that you observe. List the fault(s) associated the components	OFFICIAL USE ONLY
	A:	
	B:	
	C:	
Assessor signature		
Date of Completion		

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.	

Technician Name:

Date:

Trainer Guidance: Suspension, Steering, Wheels & Tyres 06

Module	Suspension, Steering, Wheels & Tyres
Task	Sus – 06
Task Title	Inspection of Vehicle Rear Suspension
Time – mins	10
NOS ref	IMILV08

Technician Instructions	You have been asked to check the vehicle rear suspension for wear to its components. Raise the rear of the vehicle to allow the OS & NS suspension to be checked in a manner to which would allow the various components checked correctly. The following suspension components indicate wear:
OS:	
OS:	
NS:	
NS:	

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.

Set up of task	• Vehicle to be situated on a four post lift. • Jacking beam capable of raising the vehicle to check the rear suspension of the vehicle type chosen. • Wheel bearing excessive noise / notchy. • Rear suspension bush to show excessive movement.

Vehicle/rig/other	• Vehicle with rear independent suspension can only be used on this task
Tools and equipment list	• Selection of levers - suitable to achieve the outcome of the task • Selection of hand tools to suit task • Clipboard • Inspection lamp • PPE

Marking of task

Correct answers	Correct raising of the vehicle to check suspension.
	Wheel bearing fault
	Suspension bush fault
	Correct use of hand tools
	Correct safe working practices
	Correct PPE used for task

Required to pass task
100%

Module	Suspension, Steering, Wheels & Tyres
Task	Sus - 06
Task Title	Inspection of Vehicle Rear Suspension
Time - mins	10 Minutes

Technician Instructions	You have been asked to check the vehicle rear suspension for wear to its components. Raise the rear of the vehicle to allow the OS & NS suspension to be checked in a manner to which would allow the various components checked correctly. The following suspension components indicate wear:-	OFFICIAL USE ONLY
	OS:	
	OS:	
	NS:	
	NS:	
	Use of hand tools – OFFICE USE ONLY	
	Safe working practices – OFFICE USE ONLY	
	PPE used for task – OFFICE USE ONLY	
Assessor signature		
Date of Completion		

Technician Name:

Date:

Trainer Guidance: Suspension, Steering, Wheels & Tyres 07

Module	Suspension, Steering, Wheels & Tyres
Task	Sus – 07
Task Title	Suspension Component Inspection
Time – mins	10
NOS ref	IMILV08

Technician Instructions	You have been asked to check the suspension strut for wear/faults to its components. Check the suspension strut in a manner to which would allow any faults to be identified. The following suspension strut components indicate wear/faults to:
A	
B	
C	
D	

Additional information to the Technician	Note that the task may include one or more faults; only record the faults that you have identified.
	Please ask your assessor if you require assistance with the tools and equipment provided.

Set up of task	• McPherson strut to be mounted on a rig that would give access to check the various suspension components
	• Wheel to be securely mounted (wheel & tyre to be serviceable)
	• 2 faults ONLY to include at least the following:
	  ○ Wheel bearing excessive movement
	  ○ Broken coil spring
	  ○ Coil spring rubber mount to be incorrectly located

Vehicle/rig/other	• Rig only
Tools and equipment list	• Selection of levers - suitable to achieve the outcome of the task • Selection of hand tools to suit task • Clipboard • Inspection lamp • PPE

Marking of task

Correct answers	Broken coil spring
	Wheel bearing fault
	Coil spring rubber mount incorrectly located
	Correct use of hand tools
	Correct safe working practices
	Correct PPE used for task

Required to pass task
100%

Module	Suspension, Steering, Wheels & Tyres
Task	Sus - 07
Task Title	Suspension Component Inspection
Time - mins	10 Minutes

Technician Instructions	You have been asked to check the suspension strut for wear/faults to its components. Check the suspension strut in a manner to which would allow any faults to be identified. The following suspension strut components indicate wear/faults to:	OFFICIAL USE ONLY
	A:	
	B:	
	C:	
	D:	
	Use of hand tools – OFFICE USE ONLY	
	Safe working practices – OFFICE USE ONLY	
	PPE used for task – OFFICE USE ONLY	
Assessor signature		
Date of Completion		

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.	

Technician Name:

Date:

Suspension, Steering, Wheels & Tyres: Sub-Group D

Sub-Group	**Suspension, Steering, Wheels & Tyres** Technician must complete 1 task from **each** sub-group
A	Tyre Wear
B	Inspection of vehicle front suspension (1)
	Inspection of vehicle front suspension (2)
	Steering
C	Anti-roll bar links/bushes
	Inspection of vehicle rear suspension
	Suspension component inspection
D	Steering mechanism – Vague steering
	Steering mechanism – Stiff steering
	Steering mechanism check

Trainer Guidance: Suspension, Steering, Wheels & Tyres 08

Module	Suspension, Steering, Wheels & Tyres
Task	Sus – 08
Task Title	Steering Mechanism – Vague Steering
Time – mins	10
NOS ref	IMILV08/13

Technician Instructions	You have been asked to check the steering of a vehicle, the driver has complained of vagueness to the steering of the vehicle. Using the tools and equipment available to you, check the vehicles steering mechanism and report any findings. The fault with the steering mechanism was:

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.

Set up of task	• Set up excessive play to one side of the (OS or NS) 'inner track rod' on the steering rack. Ensure that both of the steering rack boots are identical in appearance as to not pre-empt the fault on the steering rack. • Vehicle to be set up on a four post ramp, if swivel plates are fitted to the ramp, ensure that these are in the locked position. • Ramp to be fitted / not fitted with jacking beam.

Vehicle/rig/other	• Vehicle with steering rack without or with PAS
Tools and equipment list	• Selection of lever bars • Selection of hand tools to suit the task • Clipboard • Inspection lamp • PPE

Marking of task

Correct answers	Correct identification of inner track road end to either OS or NS.
	Correct safe working practices
	Correct PPE used for the task

Required to pass task
100%

Module	Suspension, Steering, Wheels & Tyres
Task	Sus - 08
Task Title	Steering Mechanism - Vague Steering
Time - mins	10 Minutes

Technician Instructions	You have been asked to check the steering of a vehicle, the driver has complained of vagueness to the steering of the vehicle. Using the tools and equipment available to you, check the vehicles steering mechanism and report any findings. The fault with the steering mechanism was:	**OFFICIAL USE ONLY**
	Safe working practices – OFFICE USE ONLY	
	PPE used for task – OFFICE USE ONLY	
Assessor signature		
Date of Completion		

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.	

Technician Name:

Date:

Trainer Guidance: Suspension, Steering, Wheels & Tyres 09

Module	Suspension, Steering, Wheels & Tyres
Task	Sus – 09
Task Title	Steering Mechanism – Stiff Steering
Time – mins	10
NOS ref	IMILV08/13

Technician Instructions	You have been asked to check the steering of a vehicle, the driver has complained of an unusual stiffness to the steering of the vehicle. Using the tools and equipment available to you, check the vehicles steering mechanism and report any findings. The fault with the steering mechanism was:

Additional information to the Technician	Note that the task may include one or more faults, only record the faults you have identified.
	Please ask your assessor if you require assistance with the tools and equipment provided.

Set up of task	• Set up a seized UJ to the steering column to give the feeling of stiff steering or a notchy action to the steering every 1/4 turn. • Allow easy access to remove the steering shaft from the steering rack/box. • Vehicle to be set up on a four post ramp, vehicle to be positioned on swivel plates that are fitted to the ramp and used for this assessment, ensure that these are in the unlocked position. • Ramp to be fitted / not fitted with jacking beam.

Vehicle/rig/other	• Vehicle or rig with steering rack/box (without or with PAS)
Tools and equipment list	• Selection of levers bars • Selection of hand tools to suit the task • Clipboard • Inspection lamp and a well-lit area of workshop • PPE

Marking of task

Correct answers	Correct identification of steering column UJ seizure
	Correct safe working practices
	Correct PPE used for the task

Required to pass task
100%

Module	Suspension, Steering, Wheels & Tyres
Task	Sus - 09
Task Title	Steering Mechanism - Stiff Steering
Time - mins	10 Minutes

Technician Instructions	You have been asked to check the steering of a vehicle, the driver has complained of an unusual stiffness to the steering of the vehicle. Using the tools and equipment available to you, check the vehicles steering mechanism and report any findings.	OFFICIAL USE ONLY
	The fault with the steering mechanism was:	
	Safe working practices – OFFICE USE ONLY	
	PPE used for task – OFFICE USE ONLY	
Assessor signature		
Date of Completion		

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.	

Technician Name:

Date:

Trainer Guidance: Suspension, Steering, Wheels & Tyres 10

Module	Suspension, Steering, Wheels & Tyres
Task	Sus – 10
Task Title	Steering Mechanism Check
Time – mins	10
NOS ref	IMILV08/13

Technician Instructions	You have been asked to check the free play in the steering mechanism, the driver has complained of vagueness to the steering of the vehicle. Using the tools and equipment available to you, check vehicles steering mechanism for 'free play' and note any components that are excessively worn. Steering component(s) worn are as follows:
A	
B	
C	

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.

Set up of task	• Set up a steering mechanism with 'one' component that gives excessive free play to the steering (noticed at the steering wheel). • Vehicle set up on a four post ramp, vehicle to be positioned off swivel plates or ensure that the swivel plates are in the locked position. • Ramp to be fitted / not fitted with jacking beam.

Vehicle/rig/other	• Vehicle without PAS
Tools and equipment list	• Selection of hand tools to suit the task • Clipboard • Inspection lamp and well-lit area of workshop • PPE

Marking of task

Correct answers	Correct identification of steering component that gives excessive free play
	Correct safe working practices
	Correct PPE used for the task

Required to pass task
100%

Module	Suspension, Steering, Wheels & Tyres
Task	Sus - 10
Task Title	Steering Mechanism Check
Time - mins	10 Minutes

Technician Instructions	You have been asked to check the free play in the steering mechanism, the driver has complained of vagueness to the steering of the vehicle. Using the tools and equipment available to you, check vehicles steering mechanism for 'free play' and note any components that are excessively worn. Steering component(s) worn are as follows:	**OFFICIAL USE ONLY**
	A:	
	B:	
	C:	
	Safe working practices – OFFICE USE ONLY	
	PPE used for task – OFFICE USE ONLY	
Assessor signature		
Date of Completion		

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.	

Technician Name:

Date:

Brakes: Sub-Group A

Sub-Group	**Brakes** Technician must complete 1 task from **each** sub-group
A	Disc Measurement
B	Brake servo
	ABS Fault (1)
	ABS Fault (2)
C	Brake fluid
	Brake pipe fabrication
	Brake pipe/hosepipe inspection
D	Disc caliper
	Handbrake – Not functioning
	Drum brake inefficient

Trainer Guidance: Brakes 01

Module	Brakes
Task	Bra - 01
Task Title	Disc - Measurement
Time – mins	10
NOS ref	IMILV13

Technician Instructions	The driver of the vehicle has identified that there is a judder/shudder when the brakes are applied. You have been asked to check one of the brake disc's for the following measurements; identify the correct dimensions as listed below using the equipment provided. Add the measurements to the items.
	Disc run out …….
	Disc thickness …….
	Variation in disc thickness …….

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.

Set up of task	• One brake disc to be mounted on a rig (mounted to the hub assembly) to allow the measurements to be taken. • Rig to be securely mounted in a vice on a work bench. • The disc needs to rotate on a bearing.

Vehicle/rig/other	• Rig
Tools and equipment list	• Work bench • Selection of hand tools to suit task • Clipboard • Inspection lamp/well-lit workshop area • Micrometer to measure the thickness of the disc • Dial Test Indicator gauge and mounts to check the run out

Marking of task

Correct answers	Correct measurement of disc run out (tolerance of +/- 0.02mm)
	Correct measurement of thickness (tolerance of +/- 0.10mm)
	Correct measurement of variation of thickness (tolerance of +/- 0.05mm)
	Correct safe working practices
	Correct PPE used for the task

Required to pass task
100%

Module	Brakes
Task	Bra - 01
Task Title	Disc - Measurement
Time - mins	10 Minutes

Technician Instructions	The driver of the vehicle has identified that there is a judder/shudder when the brakes are applied. You have been asked to check one of the brake disc's for the following measurements; identify the correct dimensions as listed below using the equipment provided. Add the measurements to the items.	**OFFICIAL USE ONLY**
	Disc run out:- ……	
	Minimum disc thickness:- ……..	
	Variation in disc thickness:- ……..	
	Safe working practices – OFFICE USE ONLY	
	PPE used for task – OFFICE USE ONLY	
Assessor signature		
Date of Completion		

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.	

Technician Name:

Date:

Brakes: Sub-Group B

Sub-Group	Brakes Technician must complete 1 task from **each** sub-group
A	Disc Measurement
B	Brake servo
	ABS Fault (1)
	ABS Fault (2)
C	Brake fluid
	Brake pipe fabrication
	Brake pipe/hosepipe inspection
D	Disc caliper
	Handbrake – Not functioning
	Drum brake inefficient

Trainer Guidance: Brakes 02

Module	Brakes
Task	Bra - 02
Task Title	Brake Servo
Time – mins	10
NOS ref	IMILV13

Technician Instructions	The driver of the vehicle has indicated that the brakes are not working effectively. They are experiencing having to push the brake pedal harder than they once did in order to stop the vehicle especially under continuous heavy braking. Identify cause of the driver experience from the driver's seat.
Fault with the brake efficiency.	

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.

Set up of task	• Brake Servo pipe restricted from inlet manifold (or vacuum pump) that prevents the servo from operating giving no brake action.

Vehicle/rig/other	• Vehicle/Rig
Tools and equipment list	• Petrol or diesel engine vehicle • Clipboard • Inspection lamp

Marking of task

Correct answers	Correctly diagnose the brake servo not working from within the driver's seat.
	Correct safe working practices.
	Correct PPE used for the task

Required to pass task
100%

Module Brakes
Task Bra - 02
Task Title Brake Servo
Time - mins 10 Minutes

Technician Instructions	The driver of the vehicle has indicated that the brakes are not working effectively. They are experiencing having to push the brake pedal harder than they once did in order to stop the vehicle especially under continuous heavy braking. Identify cause of the driver experience from the driver's seat.	**OFFICIAL USE ONLY**
	Fault(s) with the brake efficiency	
	Correct safe working practices – OFFICE USE ONLY	
	Correct PPE used for task – OFFICE USE ONLY	
Assessor signature		
Date of Completion		

Technician Name:

Date:

Trainer Guidance: Brakes 03

Module	Brakes
Task	Bra - 03
Task Title	ABS fault (1)
Time – mins	10
NOS ref	IMILV13

Technician Instructions	The driver of the vehicle has identified that the ABS Warning lamp is ON. The ABS has indicated a fault code with the NSF Wheel Speed Sensor. Diagnose the fault with the sensor/circuit. List the fault below.

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.

Set up of task	• Vehicle fitted with ABS and with inductive type sensors. • NSF Wheel Speed Sensor harness between the ABS ECU and the ABS NSF wheel speed sensor open circuit. • Extract the ABS fault code with a fault code reader and print out / laminate the print out sheet. • Allow easy access to the ABS harness between the ECU connector and the wheel speed sensor harness connector. • Remove all necessary trims.

Vehicle/rig/other	• Vehicle/Rig
Tools and equipment list	• Work bench • Selection of hand tools to suit task • Clipboard • Inspection lamp • Multimeter • Additional wiring/harness to create a temporary harness to check continuity of the wiring

Marking of task

Correct answers	Correct diagnosis of 'Open Circuit' between ABS ECU harness plug terminals and NSF wheel speed sensor
	Correct safe working practices.
	Correct PPE used for the task

Required to pass task
100%

Module	Brakes
Task	Bra - 03
Task Title	ABS fault (1)
Time - mins	10 Minutes

Technician Instructions	The driver of the vehicle has identified that the ABS Warning lamp is ON. The ABS has indicated a fault code with the NSF Wheel Speed Sensor. Diagnose the fault with the sensor/circuit. List the fault below.	**OFFICIAL USE ONLY**
	Fault with circuit:	
	Correct diagnosis of wheel speed sensor/circuit – OFFICE USE ONLY	
	Safe working practices – OFFICE USE ONLY	
	PPE used for task – OFFICE USE ONLY	
Assessor signature		
Date of Completion		

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.	

Technician Name:

Date:

Trainer Guidance: Brakes 04

Module	Brakes
Task	Bra - 04
Task Title	ABS Fault (2)
Time – mins	10
NOS ref	IMILV13/IMIAEME106

Technician Instructions	The driver of the vehicle has identified that the ABS warning lamp is **ON.** The ABS has indicated a fault code with the NSF wheel speed sensor. The ABS Wheel Speed Sensor and its circuit to the ECU have been checked and are all ok. Diagnose the ABS fault. List the fault below.
Diagnosis of NSF wheel speed sensor fault code.	

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.

Set up of task	• Vehicle fitted with ABS and with inductive type sensors. • NSF Wheel Speed Sensor rotor two adjacent rotor teeth effectively missing. Either damage the rotor or fill the gaps with metallic objects to create the effect of a damaged rotor. • Extract the ABS fault code with a fault code reader and print out/laminate the print out sheet. • Remove the NSF road wheel from the vehicle • The vehicle can be raised on a vehicle lift (two of four posts) or alternatively raised on the

	floor, with the NSF wheel removed, supported correctly. • Remove all necessary trims

Vehicle/rig/other	• Vehicle/Rig
Tools and equipment list	• Work bench • Selection of hand tools to suit task • Clipboard • Inspection lamp • Multimeter • Oscilloscope with the correct set up according to the waveform/signal voltage

Marking of task

Correct answers	Correct diagnosis of NSF wheel speed sensor rotor damaged (teeth missing).
	Correct safe working practices.
	Correct PPE used for the task.

Required to pass task
100%

Module	Brakes
Task	Bra - 04
Task Title	ABS fault (2)
Time - mins	10 Minutes

Technician Instructions	The driver of the vehicle has identified that the ABS Warning lamp is ON. The ABS has indicated a fault code with the NSF Wheel Speed Sensor. The ABS Wheel Speed Sensor and its circuit to the ECU have been checked are all OK. Diagnose the ABS fault. List the fault below:	**OFFICIAL USE ONLY**
	Diagnosis of NSF wheel speed sensor fault code:	
	Correct safe working practices – OFFICE USE ONLY	
	Correct PPE used for task – OFFICE USE ONLY	
Assessor signature		
Date of Completion		

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.	

Technician Name:

Date:

Brakes: Sub-Group C

Sub-Group	Brakes Technician must complete 1 task from **each** sub-group
A	Disc Measurement
B	Brake servo
	ABS Fault (1)
	ABS Fault (2)
C	Brake fluid
	Brake pipe fabrication
	Brake pipe/hosepipe inspection
D	Disc caliper
	Handbrake – Not functioning
	Drum brake inefficient

Trainer Guidance: Brakes 05

Module	Brakes
Task	Bra - 05
Task Title	Brake Fluid
Time – mins	10
NOS ref	IMILV12

Technician Instructions	Check the brake fluid in the containers (as identified) for its boiling point and serviceability. List (in the table below) the fluid in each of the containers in regard its serviceability. Also identify the symptom(s) that the driver of the vehicle would experience if the brake fluid were to be in a vehicles braking hydraulic system:
A: Fluid Serviceable	YES / NO
A: Driver symptom	
B: Fluid Serviceable	YES / NO
B: Driver symptom	
C: Fluid Serviceable	YES / NO
C: Driver symptom	

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.

Set up of task	• Set out 3 containers of brake fluid, one container may be of the master cylinder reservoir on a vehicle. • Label each container A to E. • Each container must contain a brake fluid with a different boiling point value, serviceable

	(300 - 220 deg c), border line (220 - 180 deg c), not serviceable (below 180 deg c). • Each assessment day AM/PM always use new fluid in one of the containers. • Fluid in one of the containers should be heavily contaminated with dirty / water content high brake fluid. • The centre must use a brake boiling point tester to measure the boiling point within 4 hours of the assessment, ideally AM and PM if the fluid is used throughout the assessment day.

Vehicle/rig/other	• N/A
Tools and equipment list	• Brake fluid tester. This can be either equipment that registers the exact boiling point or a red/amber/green brake fluid tester • Cleaning cloth and absorbent materials • Clipboard • Inspection lamp • PPE

Marking of task

Correct answers	Accurate boiling point to within 10 degrees centigrade
	Indicate which brake fluid **IS** serviceable and which is **NOT**
	Correct use of equipment
	Correct safe working practices
	Correct PPE used for the task

Required to pass task
100%

Module	Brakes
Task	Bra - 05
Task Title	Brake Fluid
Time - mins	10 Minutes

Technician Instructions	Check the brake fluid in the containers (as identified) for its boiling point and serviceability. List (in the table below) the fluid in each of the containers in regard its serviceability. Also identify the symptom(s) that the driver of the vehicle would experience if the brake fluid were to be in a vehicles braking hydraulic system:-	**OFFICIAL USE ONLY**
	A:- Fluid Serviceable = YES / NO	
	A:- Driver symptom =	
	B:- Fluid Serviceable = YES / NO	
	B:- Driver symptom =	
	C:- Fluid Serviceable = YES / NO	
	C:- Driver symptom =	
	Use of equipment – OFFICE USE ONLY	
	Safe working practices – OFFICE USE ONLY	
	PPE used for task – OFFICE USE ONLY	
Assessor signature		
Date of Completion		

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.	

Technician Name:

Date:

Trainer Guidance: Brakes 06

Module	Brakes
Task	Bra - 06
Task Title	Brake Pipe Fabrication
Time – mins	10
NOS ref	IMILV12

Technician Instructions	You have been asked to make two brake pipes to the specification below: • Brake pipe should have an internal flare at both ends and have female fittings at both ends. The brake pipe should be 10 cm in length. • Brake pipe should have an external flare at both ends and have male fittings at both ends. The brake pipe should be 10 cm in length. The finished brake pipe should be left on the bench at the end of the task.

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.

Set up of task	• On the work bench lay out all of the tools and equipment required to carry out the brake pipe fabrication. • Vice securely mounted on a workbench. • Roll of copper brake pipe available (NOT cut into lengths). • Brake pipe flaring kit to be in the packaging/toolbox that it was supplied in.

Vehicle/rig/other	• N/A
Tools and equipment list	• Work bench • Vice fitted securely to the workbench • Selection of hand tools to suit task • Tape measure • Clipboard • Well-lit area of the workshop • Roll of copper brake pipe 3/8 • Brake pipe flaring kit in packaging (opened and fully stocked) • Supply of brake pipe unions to suit brake pipe (internal/external) • Torque wrench – selection of (if applicable to brake pipe flaring kit) • Grease/oil • Manufacturer of equipment instructions/specs

Marking of task

Correct answers	Brake pipe to 10cm (+/- 0.5 cm)
	External flare
	Internal flare
	Correct unions fitted to brake pipe
	Correct safe working practices.
	Correct PPE used for the task

Required to pass task
100%

Module Brakes
Task Bra - 06
Task Title Brake Pipe Fabrication
Time - mins 10 Minutes

Technician Instructions	You have been asked to make two brake pipes to the specification below:-	**OFFICIAL USE ONLY**
	Brake pipe should have an internal flare at both ends and have female fittings at both ends. The brake pipe should be 10 cm in length.	
	Brake pipe should have an external flare at both ends and have male fittings at both ends. The brake pipe should be 10 cm in length.	
	Correct unions fitted to brake pipe – OFFICE USE ONLY	
	Safe working practices – OFFICE USE ONLY	
	PPE used for task – OFFICE USE ONLY	
Assessor signature		
Date of Completion		

The finished brake pipe should be left on the bench at the end of the task.

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.	

Technician Name:

Date:

Trainer Guidance: Brakes 07

Module	Brakes
Task	Bra - 07
Task Title	Brake Pipe/Brake Hose Inspection
Time – mins	10
NOS ref	IMILV12

Technician Instructions	You have been asked to check the vehicles brake pipes / brake hoses for their condition and their serviceability. Check the brake pipes in a manner to which would allow any faults to be identified. Visual inspect only, DO NOT scrape or physically remove any surface contamination from the brake pipes hoses presented. The following brake pipes / brake hose condition and serviceability: A: O/S/F Condition = Serviceable = B: N/S/F Condition = Serviceable = C: Rear Condition = Serviceable = List two faults that could be seen with a 'flexible brake hose'. D: E:

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.

Set up of task	Vehicle / rig with brake pipes / brake hoses with three faults from the list below: • Kinked • Stretched or twisted • Excessively chafed, damaged or deteriorated • Brake hose ferrule(s)excessively corroded • Exposed to excessive heat

Vehicle/rig/other	• Vehicle/rig
Tools and equipment list	• Brake pipe corrosion tool • Selection of hand tools to suit task • Clipboard • Inspection lamp • Well-lit workshop area • PPE

Marking of task

Correct answers	Correct ID of each brake pipe / brake hose condition
	Correct ID of each brake pipe / brake hose serviceability
	Correct safe working practices.
	Correct PPE used for the task.

Required to pass task
100%

Module Brakes
Task Bra - 7
Task Title Brake Pipe/Brake Hose Inspection
Time - mins 10 Minutes

Technician Instructions	You have been asked to check the vehicles brake pipes / brake hoses for their condition and their serviceability. Check the brake pipes in a manner to which would allow any faults to be identified. Visual inspect only, DO NOT scrape or physically remove any surface contamination from the brake pipes hoses presented. The following brake pipes / brake hose condition and serviceability:-	**OFFICIAL USE ONLY**
	A:- O/S/F Condition = Serviceable =	
	B:- N/S/F Condition = Serviceable =	
	C:- Rear Condition = Serviceable =	
	List two faults that could be seen with a 'flexible brake hose'.	
	D: ……	
	E: ……	
	Safe working practices – OFFICE USE ONLY	
	PPE used for task – OFFICE USE ONLY	
Assessor signature		
Date of Completion		

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.	

Technician Name:

Date:

Brakes: Sub-Group D

Sub-Group	**Brakes** Technician must complete 1 task from **each** sub-group
A	Disc Measurement
B	Brake servo
	ABS Fault (1)
	ABS Fault (2)
C	Brake fluid
	Brake pipe fabrication
	Brake pipe/hosepipe inspection
D	Disc caliper
	Handbrake – Not functioning
	Drum brake inefficient

Trainer Guidance: Brakes 08

Module	Brakes
Task	Bra - 08
Task Title	Disc Caliper
Time – mins	10
NOS ref	IMILV12

Technician Instructions	The front brake lining is worn unevenly; inspect the front caliper (as indicated by your assessor) for the worn / seized components that would cause the brake linings to wear unevenly. Identify from the fault(s) the customer concern. Brake lining component fault…….. Brake caliper/hydraulic component fault…… Identify the driver concern……

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.

Set up of task	• Brake pad fault (incorrectly set/worn brake pad one side (below 75% of original spec) or seized caliper / damaged or removed dust cover to sliding mechanism. • Vehicle / Rig to be can be used securely mounted on workbench. • Wheels removed from the vehicle.

Vehicle/rig/other	• Vehicle/Rig
Tools and equipment list	• Work bench • If applicable - vice fitted to workbench that allows caliper / disc assembly to be held securely • Selection of hand tools to suit task • Clipboard • Inspection lamp • Torque wrench - selection of • Manufacturer instructions / specs

Marking of task

Correct answers	Correctly identify the brake pads worn
	Correctly identify the disc / caliper worn component
	Correct use of torque wrench (if used) and at specified setting (less 50%)
	Correct safe working practices.
	Correct PPE used for the task.

Required to pass task
100%

Module Brakes
Task Bra - 08
Task Title Disc Caliper
Time - mins 10 Minutes

Technician Instructions	The front brake lining is worn unevenly; inspect the front caliper (as indicated by your assessor) for the worn / seized components that would cause the brake linings to wear unevenly. Identify from the fault(s) the customer concern.	**OFFICIAL USE**
	Brake lining component fault: ……	
	Brake caliper / hydraulic component fault: ……	
	Identify the driver concern: ……	
	Safe working practices – OFFICE USE ONLY	
	PPE used for task – OFFICE USE ONLY	
Assessor signature		
Date of Completion		

Technician Name:

Date:

Trainer Guidance: Brakes 09

Module	Brakes
Task	Bra - 09
Task Title	Handbrake – Not Functioning
Time – mins	10
NOS ref	IMILV13

Technician Instructions	The brakes on the vehicle have been inspected and the handbrake to the OS/NS, refer to assessor re the side Not Working (NW). Inspect the brake mechanism to the rear shoe set up and adjust the rear brake to suit. Ensure that the handbrake is correctly set at the end of the task.

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.

Set up of task	• Vehicle or rig with drum brakes to rear, automatic adjusters incorporated within the drum. • Allow easy access to the handbrake adjustment; ensure that the adjustment mechanism is free and easily adjustable. • Slacken off the automatic brake shoe adjuster to the OS/NS (dependent on the requirement), readjust to the minimum requirement. • Rear wheels to be removed from vehicle/rig. • Once the brake shoes have been adjusted correctly then the handbrake should come within spec. • Ensure that the drum(s) are not lipped/worn **Note that this task will not automatically reset**

Vehicle/rig/other	• Vehicle/Rig
Tools and equipment list	• Work bench • Selection of hand tools to suit task • Clipboard • Inspection lamp

Marking of task

Correct answers	Correct adjustment of rear brake shoes.
	Correct adjustment of handbrake to the minimum requirement.
	Correct safe working practices.
	Correct PPE used for the task.

Required to pass task
100%

Module Brakes
Task Bra - 09
Task Title Handbrake - Not Functioning
Time - mins 10 Minutes

Technician Instructions	The brakes on the vehicle have been inspected and the handbrake to the OS/NS, refer to assessor re the side Not Working (NW). Inspect the brake mechanism to the rear shoe set up and adjust the rear brake to suit. Ensure that the handbrake is correctly set at the end of the task.	**OFFICIAL USE ONLY**
	Adjustment of rear brake shoes - – OFFICE USE ONLY	
	Adjustment of handbrake to the minimum requirement – OFFICE USE ONLY	
	Safe working practices – OFFICE USE ONLY	
	PPE used for task – OFFICE USE ONLY	
Assessor signature		
Date of Completion		

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.	

Technician Name:

Date:

Trainer Guidance: Brakes 10

Module	Brakes
Task	Bra - 10
Task Title	Brake Drum Inefficient
Time – mins	10
NOS ref	IMILV13

Technician Instructions	The brake (as indicated by the assessor) has been deemed inefficient. Inspect the brake assembly (as indicated) and note your findings on the document provided. Make any recommendations that you think will resolve the inefficiencies.
A	
B	
C	

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.

Set up of task	• Vehicle or rig with drum brakes to rear. • Soak the lining of the 'leading brake shoe' in brake fluid. The brake shoe should be immersed for a minimum of 24 hours in brake fluid. Once soaked, refit the brake shoe to the brake assembly correctly and adjust the brake shoes correctly. • Peel back the wheel cylinder dust covers and fill the dust cover with brake fluid to indicate that the wheel cylinder is leaking which results in contaminating the brake shoe. • Rear wheels to be removed from vehicle/rig • Adjust the drum brakes so they are within specification.

	• Ensure that the drums are not lipped/worn.

Vehicle/rig/other	• Vehicle/rig
Tools and equipment list	• Work bench • Selection of hand tools to suit task • Clipboard • Inspection lamp

Marking of task

Correct answers	Correct identification of rear brake shoe contaminated.
	Correct identification of rear brake wheel cylinder leaking.
	Correct safe working practices.
	Correct PPE used for the task.

Required to pass task
100%

Module Brakes
Task Bra - 10
Task Title Drum Brake Inefficient
Time - mins 10 Minutes

Technician Instructions	The brake (as indicated by the assessor) has been deemed inefficient. Inspect the brake assembly (as indicated) and note your findings on the document provided. Make any recommendations that you think will resolve the inefficiencies. Identification of rear brake components requiring replacement are:	**OFFICIAL USE ONLY**
	A:	
	B:	
	C:	
	Safe working practices – OFFICE USE ONLY	
	PPE used for task – OFFICE USE ONLY	
Assessor signature		
Date of Completion		

Technician Name:

Date:

Emission: Sub-Group A

Sub-Group	Emissions Technician must complete 1 task from **each** sub-group
A	Live Data – Analyse Data
B	Emission tester
	Emission test sample
	Petrol injector fault
C	O2 Sensor – Data (1)
	O2 Sensor – Data (2)
	Scan tool data
D	Fuel system
	Engine non-start (1)
	Engine non-start (2)

Trainer Guidance: Emission 01

Module	Emission
Task	Emi - 01
Task Title	Live Data – Analyse Data
Time – mins	10
NOS ref	IMIAEME106

Technician Instructions	To identify various "Live Data" from the scan tool data list and indicate whether the data is correct or incorrect, mark the correct / incorrect **(* = delete as applicable)** below. A: Engine Speed - **correct / incorrect*** B: Engine Coolant Temperature - **correct / incorrect *** C: Fuel Pump Relay - **correct / incorrect *** D: Throttle Position - **correct / incorrect *** E: Oxygen sensor (1) - **correct / incorrect **

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.

Set up of task	• Petrol engine vehicle / petrol rig with scan tool connected and the data list which is displayed on the tool / equipment. • One of the data list parameters to be out specification (through sensor/actuator signal manipulation). • Ensure that the engine temperature is at the correct operating temperature prior to ALL tests assessed. • Ensure that the scan tool is in correct working order and communicates with the Engine Management system.

	• This task is NOT about the navigation of the test equipment; if the Technician needs assistance the Technician **must** be assisted.

Vehicle/rig/other	• Vehicle/Rig – petrol engine
Tools and equipment list	• Scan tool • Work bench • Well-lit workshop area • Technician marking sheet

Marking of task

Correct answers	**Delete as applicable to show correct / incorrect**
	A: Engine Speed - **correct / incorrect***
	B: Engine Coolant Temperature - **correct / incorrect ***
	C: Fuel Pump Relay - **correct / incorrect ***
	D: Throttle Position - **correct / incorrect ***
	E:-Oxygen sensor (1) - **correct / incorrect ***

Required to pass task
100%

Module Emission
Task Emi- 01
Task Title Live Data - Analyse Data
Time - mins 10 Minutes

Technician Instructions	To identify various "Live Data" from the scan tool data list and indicate whether the data is correct or incorrect, mark the correct / incorrect **(* = delete as applicable)** below.	**OFFICIAL USE ONLY**
	A: Engine Speed - **correct / incorrect***	
	B: Engine Coolant Temperature - **correct / incorrect ***	
	C: Fuel Pump Relay - **correct / incorrect ***	
	D: Throttle Position - **correct / incorrect ***	
	E: Oxygen sensor (1) - **correct / incorrect ***	
Assessor signature		
Date of Completion		

Technician Name:

Date:

Emission: Sub-Group B

Sub-Group	Emissions Technician must complete 1 task from **each** sub-group
A	Live Data – Analyse Data
B	Emission tester
	Emission test sample
	Petrol injector fault
C	O2 Sensor – Data (1)
	O2 Sensor – Data (2)
	Scan tool data
D	Fuel system
	Engine non-start (1)
	Engine non-start (2)

Trainer Guidance: Emission 02

Module	Emission
Task	Emi - 02
Task Title	Emission Tester
Time – mins	10
NOS ref	IMILV07

Technician Instructions	You have been asked to check the emissions from a petrol engine vehicle using an industry emission tester. Check the emission output from the tester and make a diagnosis as to the possible fault(s) from the list of faults below **(* = delete as appropriate)**: Petrol injection fault * Ignition system / engine mechanical fault * No fault indicated by results * Exhaust system fault * Induction system fault *

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.

Set up of task	• Ignition misfire fault - suggest close a spark plug gap to produce an ignition misfire and increase the HC emitted in the exhaust gas. • Increase in HC content in the exhaust emission. • Ensure that the engine temperature is at the correct operating temperature with ALL tests. • Ensure that the exhaust emission tester is of the correct working order. • The emission tester to measure 4 exhaust gasses, CO, HC, O2, and CO2.

Vehicle/rig/other	• Vehicle/Rig – petrol engine
Tools and equipment list	• Exhaust Gas analyser with print out facility • Exhaust extraction system securely fitted to exhaust tailpipe • Selection of hand tools to suit task • Clipboard • Well-lit workshop area • PPE

Marking of task

Correct answers	Correct identification of possible fault exhaust gas analyser results against given faults.
	Petrol injection fault.
	Correct safe working practices.
	Correct PPE used for the task.

Required to pass task
100%

Module Emission
Task Emi - 02
Task Title Emission Tester
Time - mins 10 Minutes

Technician Instructions	You have been asked to check the emissions from a petrol engine vehicle using an industry emission tester. Check the emission output from the tester and make a diagnosis as to the possible fault(s) from the list of faults below (* = delete as appropriate):-	**OFFICIAL USE ONLY**
	Petrol injection fault *	
	Ignition system / engine mechanical fault *	
	No fault indicated by results *	
	Exhaust system fault *	
	Induction system fault *	
	Safe working practices – OFFICE USE ONLY	
	PPE used for task – OFFICE USE ONLY	
Assessor signature		
Date of Completion		

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.	

Technician Name:

Date:

Trainer Guidance: Emission 03

Module	Emission
Task	Emi - 03
Task Title	Emission Test Sample
Time – mins	10
NOS ref	IMILV07

Technician Instructions	You are given a selection of emission test results from a petrol engine vehicle. From the five results provided, identify which fault relates to the engine fault(s) provided. Mark the letter aligned to the fault on the document provided. A. Fuel misfire B. Ignition misfire C. Exhaust leak D. Inlet manifold leak E. No emission fault(s)

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.

Set up of task	• Illustration of five different sets of emission related data which is to be laid out to the Technician. • Laminate the data on A4 paper and make up a document set either in a folder or bound/linked. • Clearly identify on 'each' illustration the letter of the data set. • Allow the letter to be transferred between the sheets for flexibility.

Vehicle/rig/other	• No vehicle or rig needed.
Tools and equipment list	• 5 pictures laminated and labelled A to E • Technician marking sheet

Marking of task

Correct answers	A.	Data required
	B.	Data required
	C.	Data required
	D.	Data required
	E.	Data required

Required to pass task
100%

Module	Emission
Task	Emi - 03
Task Title	Emission Test Sample
Time - mins	10 Minutes

Technician Instructions	You are given a selection of emission test results from a petrol engine vehicle. From the five results provided, identify which fault relates to the engine fault(s) provided. Mark the letter aligned to the fault on the document provided.	**OFFICIAL USE ONLY**
	Fuel misfire	
	Ignition misfire	
	Exhaust leak	
	Inlet manifold leak	
	No emission fault(s)	
Assessor signature		
Date of Completion		
Assessor signature		
Date of Completion		

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.	

Technician Name:

Date:

Trainer Guidance: Emission 04

Module	Emission
Task	Emi - 04
Task Title	Petrol Injector Fault
Time – mins	10
NOS ref	IMILV07

Technician Instructions	You have been asked to check the injectors for their control signal. Using the tools and equipment available to you, determine which injector is not being controlled correctly? • Identification of live data. • Cylinder: ……. (1 thru 4 to 6)

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.

Set up of task	• Ensure that the engine temperature is at the correct operating temperature with ALL tests. • Ensure that the scan tool is in correct working order and communicates with the Engine Management system. • Limit the voltage to the injector of one cylinder by open circuit between the injector and the ECU.

Vehicle/rig/other	• Vehicle/Rig – petrol/diesel engine.
Tools and equipment list	• Scan tool with correct software to vehicle Engine Management system restricted to live data only • Oscilloscope • Multimeter (with duty cycle/injector duration) • Exhaust extraction system securely fitted to exhaust tailpipe • Selection of hand tools to suit task • Clipboard • Well-lit workshop area • PPE

Marking of task

Correct answers	Correct cylinder injector identified as not working correctly
	Correct identification of incorrect sensor/actuator signal data
	Correct safe working practices.
	Correct PPE used for task.

Required to pass task
100%

Module	Emission
Task	Emi - 04
Task Title	Petrol Injector Fault
Time - mins	10 Minutes

Technician Instructions	You have been asked to check the injectors for their control signal. Using the tools and equipment available to you, determine which injector is not being controlled correctly?	**OFFICIAL USE ONLY**
	Identification of correct live data	
	Cylinder: ……. (1 thru 4 to 6)	
	Safe working practices – OFFICE USE ONLY	
	PPE used for task – OFFICE USE ONLY	
Assessor signature		
Date of Completion		

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.	

Technician Name:

Date:

Emission: Sub-Group C

Sub-Group	Emissions Technician must complete 1 task from **each** sub-group
A	Live Data – Analyse Data
B	Emission tester
	Emission test sample
	Petrol injector fault
C	O2 Sensor – Data (1)
	O2 Sensor – Data (2)
	Scan tool data
D	Fuel system
	Engine non-start (1)
	Engine non-start (2)

Trainer Guidance: Emission 05

Module	Emission
Task	Emi - 05
Task Title	O2 Sensor – Data (1)
Time – mins	10
NOS ref	IMILV07

Technician Instructions	You have been asked to check the oxygen sensor reading via the 'live data' from a scan tool. Check the live data from the scan tool and make a diagnosis as to the possible fault(s) from the list of faults below **(* = delete as appropriate):** A. Engine running rich* B. Engine running weak* C. No fault indicated* D. Exhaust system fault* E. Incorrect fuel to engine type*

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.

Set up of task	• Engine running rich which is sensed by the oxygen sensor signal live voltage data reading, could be achieved by decreasing the engine coolant temperature signal (high signal voltage) or by allowing the MAP sensor to sense atmospheric pressure (blank off MAP inlet manifold). • Petrol engine fitted with Zirconia type oxygen sensor. • Ensure that the engine temperature is at the correct operating temperature with ALL tests.

	• Ensure that the scan tool is in correct working order and communicates with the Engine Management System.

Vehicle/rig/other	• Vehicle/Rig – petrol engine.
Tools and equipment list	• Scan tool with correct software to system • Exhaust extraction system securely fitted to exhaust tailpipe • Selection of hand tools to suit task • Clipboard • Well-lit workshop area • PPE

Marking of task

Correct answers	Correct identification of possible fault (engine running rich) by oxygen sensor results against given faults.
	Correct safe working practices.
	Correct PPE used for task.

Required to pass task
100%

Module Emission
Task Emi - 05
Task Title O2 Sensor - Data (1)
Time - mins 10 Minutes

Technician Instructions	You have been asked to check the oxygen sensor reading via the 'live data' from a scan tool. Check the live data from the scan tool and make a diagnosis as to the possible fault(s) from the list of faults below **(* = delete as appropriate)** :	**OFFICIAL USE ONLY**
	A: Engine running rich *	
	B: Engine running weak *	
	C: No fault indicated *	
	D: Exhaust system fault *	
	E: Incorrect fuel to engine type *	
	Safe working practices – OFFICE USE ONLY	
	PPE used for task – OFFICE USE ONLY	
Assessor signature		
Date of Completion		

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.	

Technician Name:

Date:

Trainer Guidance: Emission 06

Module	Emission
Task	Emi - 06
Task Title	O2 Sensor – Data (2)
Time – mins	10
NOS ref	IMILV07

Technician Instructions	You have been asked to check the oxygen sensor reading via the 'live data' from a scan tool. Check the live data from the scan tool and make a diagnosis as to the possible fault(s) from the list of faults below **(* = delete as appropriate)**:

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.

Set up of task	• Engine running weak which is sensed by the oxygen sensor signal live data voltage reading, this could be achieved by introducing an 'air leak' to the inlet manifold. • Petrol engine fitted with Zirconia type oxygen sensor. • Ensure that the engine temperature is at the correct operating temperature with ALL tests. • Ensure that the scan tool is in correct working order and communicates with the Engine Management system.

Vehicle/rig/other	• Vehicle/rig – petrol engine.
Tools and equipment list	• Scan tool with correct software to system • Exhaust extraction system securely fitted to exhaust tailpipe • Selection of hand tools to suit task • Clipboard • Well-lit workshop area • PPE

Marking of task

Correct answers	Correct identification of possible fault (engine running weak) by oxygen sensor results against given faults.
	Correct safe working practices.
	Correct PPE used for task.

Required to pass task
100%

Module Emission
Task Emi - 06
Task Title O2 Sensor - Data (2)
Time - mins 10 Minutes

Technician Instructions	You have been asked to check the oxygen sensor reading via the 'live data' from a scan tool. Check the live data from the scan tool and make a diagnosis as to the possible fault(s) from the list of faults below **(* = delete as appropriate)**:	**OFFICIAL USE ONLY**
	A: Engine running rich *	
	B: Engine running weak *	
	C: No fault indicated *	
	D: Exhaust system fault *	
	E: Incorrect fuel to engine type *	
	Safe working practices – OFFICE USE ONLY	
	PPE used for task – OFFICE USE ONLY	
Assessor signature		
Date of Completion		

Technician Name:

Date:

Trainer Guidance: Emission 07

Module	Emission
Task	Emi - 07
Task Title	Scan Tool Data
Time – mins	10
NOS ref	IMILV07

Technician Instructions	You have been asked to check the following sensor/actuator readings via the 'live data' from a scan tool. Check the live data from the scan tool and identify the following sensor reading at the specified engine RPM (speed):- A: Mass Air Flow/Map sensor @ 2,000rpm = B. Oxygen sensor (1) @ engine idle speed = C. Throttle Position Sensor @ 1,500rpm = D. Injection duration/data @ 2,000rpm E. Engine Coolant Temperature @ idle speed = Which of these data readings do you identify as being incorrect with the engine at the various speed settings?

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.

Set up of task	• Ensure that the engine temperature is at the correct operating temperature with ALL tests. • Ensure that the scan tool is in the correct working order and communicates with the Engine Management system. • Insert a resistor into the engine coolant temperature sensor signal circuit to produce a significant voltage high (suggest approx. constant 4, 5 volts) without producing a 'fault code' applicable to the sensor.

Vehicle/rig/other	• Vehicle/Rig – petrol/diesel engine.
Tools and equipment list	• Scan tool with correct software to system • Exhaust extraction system securely fitted to exhaust tailpipe • Selection of hand tools to suit task • Clipboard • Well-lit workshop area • PPE

Marking of task

Correct answers	Correct identification of scan tool live data @ the correct RPM (within 100 +/- RPM)
	Correct identification of incorrect sensor/actuator signal data.
	Correct safe working practices.
	Correct PPE used for task.

Required to pass task
100%

Module	Emission
Task	Emi - 07
Task Title	Scan Tool Data
Time - mins	10 Minutes

Technician Instructions	You have been asked to check the following sensor/actuator readings via the 'live data' from a scan tool. Check the live data from the scan tool and identify the following sensor reading at the specified engine RPM (speed):-	**OFFICIAL USE ONLY**
	A: Mass Air Flow / Map sensor @ 2,000rpm =	
	B: Oxygen sensor (1) @ engine idle speed =	
	C: Throttle Position Sensor @ 1,500 rpm =	
	D: Injection duration/data @ 2,000rpm =	
	E: Engine Coolant Temperature @ idle speed =	
	Which of these data readings do you identify as being incorrect with the engine at the various speed settings? ……	
	Safe working practices – OFFICE USE ONLY	
	PPE used for task – OFFICE USE ONLY	
Assessor signature		
Date of Completion		

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.	

Technician Name:

Date:

Emission: Sub-Group D

Sub-Group	Emissions Technician must complete 1 task from **each** sub-group
A	Live Data – Analyse Data
B	Emission tester
	Emission test sample
	Petrol injector fault
C	O2 Sensor – Data (1)
	O2 Sensor – Data (2)
	Scan tool data
D	Fuel system
	Engine non-start (1)
	Engine non-start (2)

Trainer Guidance: Emission 08

Module	Emission
Task	Emi - 08
Task Title	Fuel System
Time – mins	10
NOS ref	IMILV07

Technician Instructions	You have been asked to check the engine running fault with a diesel system running fault from the faults indicated below **(* = delete as appropriate)**: A: Diesel injection fault * B: Fuel ignition fault * C: No fault * D: Exhaust system fault * E: Turbo system fault *

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.

Set up of task	• Diesel injector misfire fault - suggest block/restrict the injector fuel supply at the fuel inlet to the injector. • Misfire to the engine • Ensure that the engine temperature is at the correct operating temperature with ALL tests.

Vehicle/rig/other	• Vehicle/Rig – naturally aspirated diesel engine.
Tools and equipment list	• Scan tool connected to engine with data list selected • Exhaust extraction system securely fitted to exhaust tailpipe • Selection of hand tools to suit task • Clipboard • Well-lit workshop area • PPE

Marking of task

Correct Answers	Correct identification of possible fault from selection of given faults.
	Correct safe working practices.
	Correct PPE used for task.

Required to pass task
100%

Module Emission
Task Emi - 08
Task Title Fuel System
Time - mins 10 Minutes

Technician Instructions	You have been asked to check the engine running fault with a diesel system running fault from the faults indicated below **(* = delete as appropriate)**:	**OFFICIAL USE ONLY**
	Diesel injection fault *	
	Fuel ignition fault *	
	No fault *	
	Exhaust system fault *	
	Turbo system fault *	
	Correct safe working practices – OFFICE USE ONLY	
	Correct PPE used for task – OFFICE USE ONLY	
Assessor signature		
Date of Completion		

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.	

Technician Name:

Date:

Trainer Guidance: Emission 09

Module	Emission
Task	Emi - 09
Task Title	Engine Non-Start (1)
Time – mins	10
NOS ref	IMILV07

Technician Instructions	You have been asked to diagnose the engine non-start which has been initially diagnosed to a fuel related fault. Diagnose the fault and list below. Fault with the engine system……..

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.

Set up of task	• Block the fuel supply from the fuel tank so the engine will not start. • Easy access to fuel filter/fuel line. • Easy access to ignition system components. • Ensure that the scan tool is in correct working order and communicates with the Engine Management system.

Vehicle/rig/other	• Vehicle/Rig – petrol/diesel (common rail) engine.
Tools and equipment list	• Container to accept fuel • Ignition/spark neon/LED light tester to measure HT voltage • Scan tool with correct software to vehicle Engine Management system to allow access to live data • Multimeter • Selection of hand tools to suit task • Clipboard • Well-lit workshop area • PPE

Marking of task

Correct answers	Correctly identify fuel not being supplied from fuel pump to engine F1
	Correct safe working practices.
	Correct PPE used for task.

Required to pass task
100%

Module	Emission
Task	Emi - 09
Task Title	Engine Non-Start (1)
Time - mins	10 Minutes

Technician Instructions	You have been asked to diagnose the engine non start which has been initially diagnosed to a fuel related fault. Diagnose the fault & list below?	**OFFICIAL USE ONLY**
	Fault with engine system:	
	Safe working practices – OFFICE USE ONLY	
	PPE used for task – OFFICE USE ONLY	
Assessor signature		
Date of Completion		

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.	

Technician Name:

Date:

Trainer Guidance: Emission 10

Module	Emission
Task	Emi - 10
Task Title	Engine Non-Start (2)
Time – mins	10
NOS ref	IMILV07

Technician Instructions	You have been asked to diagnose the engine non-start which has been initially diagnosed correctly to an ignition related fault. Diagnose the fault.

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.

Set up of task	• Fuse to ignition coil(s) blown (spare fuse available) to prevent engine from starting. • Easy access to fuel filter/fuel line. • Easy access to ignition system components. • Ensure that the scan tool is in correct working order and communicates with the Engine Management system.

Vehicle/rig/other	• Vehicle/Rig – petrol engine.
Tools and equipment list	• Vehicle workshop manual (electrical wiring diagram + fuse location) • Ignition, spark neon or LED light tester to measure HT voltage • Scan tool with correct software to vehicle Engine Management system to allow access to live data • Multimeter • Selection of hand tools to suit task

	• Clipboard • Well-lit workshop area • PPE

Marking of task

Correct answers	Correct fuse blown to ignition coil(s)
	Correct safe working practices.
	Correct PPE used for task.

Required to pass task
100%

Module Emission
Task Emi - 10
Task Title Engine Non-Start (2)
Time - mins 10 Minutes

Technician Instructions	You have been asked to diagnose the engine non start which has been initially diagnosed correctly to an ignition related fault.	**OFFICIAL USE ONLY**
	Diagnose the fault to:	
	Safe working practices – OFFICE USE ONLY	
	PPE used for task – OFFICE USE ONLY	
Assessor signature		
Date of Completion		

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.	

Technician Name:

Date:

Electrical: Sub-Group A

Sub-Group	Electrical Technician must complete 1 task from **each** sub-group
A	Electrical wiring fault (1)
B	Resistance check
	Circuit produce – relay
	Circuit relay fault
C	Fault code diagnosis
	CAN network fault
	Electrical wiring fault (2)
D	Oscilloscope measurement
	Oscilloscope waveform ID
	Wiring diagram identification

Trainer Guidance: Electrical 01

Module	Electrical
Task	Ele - 01
Task Title	Electrical Wiring Fault (1)
Time – mins	10
NOS ref	IMIAEME106

Technician Instructions	A side light is dimly lit (as identified by your assessor). Diagnose the fault with the circuit using the tools and equipment provided and indicate the fault with the circuit from the list below **(* = delete as applicable)**. Measure the voltage at the earth side of the side lamp bulb holder:
	Wiring harness fault - high resistance to the supply to the bulb holder *
	Wiring harness fault - short circuit to the bulb holder *
	Wiring harness fault - high resistance to the earth circuit to the bulb holder *
	Fuse blown to the side lamp circuit *
	Short circuit to the OS side lamp circuit *
	Voltage measured at earth side of side lamp bulb holder = ……. Volts

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.

Set up of task	• OS side lamp dimly lit. • High resistance in the side light bulb holder supply circuit, sufficient to illuminate an LED test lamp if used for diagnosis.

Vehicle/rig/other	• Vehicle or electrical rig.
Tools and equipment list	• Multimeter • LED test lamp/circuit tester • Vehicle Information – Electrical wiring diagram • Vehicle Information – Component location(s) • Various electrical connector/test leads • Well-lit area of workshop/inspection lamp • Technician marking sheet • PPE

Marking of task

Correct answers	Correct - Wiring harness fault - high resistance to the supply to the bulb holder *
	Correct safe working practices
	Correct PPE used for task

Required to pass task
100%

Module	Electrical
Task	Ele - 01
Task Title	Electrical Wiring Fault (1)
Time - mins	10 Minutes

Technician Instructions	A side light is dimly lit (as identified by your assessor). Diagnose the fault with the circuit using the tools and equipment provided and indicate the fault with the circuit from the list below **(* = delete as applicable)**. Measure the voltage at the earth side of the side lamp bulb holder:	**OFFICIAL USE ONLY**
	Wiring harness fault - high resistance to the supply to the bulb holder *	
	Wiring harness fault - short circuit to the bulb holder *	
	Wiring harness fault - high resistance to the earth circuit to the bulb holder *	
	Fuse blown to the side lamp circuit *	
	Short circuit to the OS side lamp circuit *	
	Voltage measured at earth of side lamp bulb holder = …… Volts	
	Safe working practices – OFFICE USE ONLY	
	PPE used for task – OFFICE USE ONLY	
Assessor signature		
Date of Completion		

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.	

Technician Name:

Date:

Electrical: Sub-Group B

Sub-Group	Electrical Technician must complete 1 task from **each** sub-group
A	Electrical wiring fault (1)
B	Resistance check
	Circuit produce – relay
	Circuit relay fault
C	Fault code diagnosis
	CAN network fault
	Electrical wiring fault (2)
D	Oscilloscope measurement
	Oscilloscope waveform ID
	Wiring diagram identification

Trainer Guidance: Electrical 02

Module	Electrical
Task	Ele - 02
Task Title	Resistance Check
Time – mins	10
NOS ref	IMILV03

Technician Instructions	Identify various electrical resistances from the 5 wires presented to you. Identify the resistance of each wire, mark the resistance value aligned to the wire (A to E) on the document provided below. A: B: C: D: E:

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.

Set up of task	• Build 5 lengths of wire 15 - 20cm in length. • Each wire to have a different resistance value. • Clearly identify on 'each' wire the letter associated with the resistance value. Develop so these can be changed mid assessment to prevent Technicians from overlooking others.

Vehicle/rig/other	• No vehicle or rig needed
Tools and equipment list	• 5 wires ,labelled A-E, laid out on workbench • Workbench • Well-lit area • Technician marking sheet

Marking of task

Correct answers	**Resistance to be measured +/- 50 Ohms of specification.**
	Zero (0) Ohms
	50 - 100 Ohms
	400 - 600 Ohms
	1000 - 1500 Ohms
	Open circuit

Required to pass task
100%

Module Electrical
Task Ele - 02
Task Title Resistance Check
Time - mins 10 Minutes

Technician Instructions	To identify various electrical resistances from the 5 wires presented to you. Identify the resistance of each wire, mark the resistance value aligned to the wire (A to E) on the document provided below.	**OFFICIAL USE ONLY**
	A:	
	B:	
	C:	
	D:	
	E:	
Assessor signature		
Date of Completion		

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.	

Technician Name:

Date:

Trainer Guidance: Electrical 03

Module	Electrical
Task	Ele - 03
Task Title	Circuit Produce - Relay
Time – mins	10
NOS ref	IMILV03

Technician Instructions	You are asked to produce an electrical circuit using the various components and circuit board given to you so that a switch operates an open four pin relay which in turn operates a lamp; the circuit diagram has been given to you. Measure the voltage at the bulb holder earth connection when the circuit is working (i.e. bulb illuminated). Measure the voltage at the bulb earth connection with the circuit / bulb illuminated = …….:…… Volts

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.

Set up of task	• Circuit board without components fitted (example Locktronics or similar) • 1 relay (open 4 pin relay) • 10 solid wires • 1 bulb and holder • 1 circuit diagram

Vehicle/rig/other	• No vehicle or rig needed – electrical circuit board.
Tools and equipment list	• Multimeter with DC volts • Workbench • Well-lit area • Technician marking sheet

Marking of task

Correct answers	Built circuit that functions – when switch is operated, the relay bulb illuminates.
	Correct measurement of voltage at point 'A' (+/- 0.2 volts).

Required to pass task
100%

Module	Electrical
Task	Ele - 03
Task Title	Circuit Produce - Relay
Time - mins	10 Minutes

Technician Instructions	You are asked to produce an electrical circuit using the various components and circuit board given to you so that a switch operates an open four pin relay which in turn operates a lamp; the circuit diagram has been given to you. Measure the voltage at the bulb holder earth connection when the circuit is working (i.e. bulb illuminated).	**OFFICIAL USE ONLY**
	Measure the voltage at the bulb earth connection with the circuit / bulb illuminated = ……. : …… Volts	
	Circuit function – OFFICE USE ONLY	
Assessor signature		
Date of Completion		

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.	

Technician Name:

Date:

Trainer Guidance: Electrical 04

Module	Electrical
Task	Ele - 04
Task Title	Circuit Relay Fault
Time – mins	10
NOS ref	IMIAEME106

Technician Instructions	You are asked to diagnose an electrical circuit fault (as identified by your assessor) to a circuit that does not function correctly. The fuse to the circuit has been checked correctly, the fuse is OK and supplying the circuit with voltage. The component (consumer) has already been checked and also OK. It is suspected that the relay to the circuit is not operating correctly. Fault with circuit wiring / relay: ……

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.

Set up of task	• Vehicle / rig with easy accessible relay / wiring. • Relay to have internal contacts disabled but still clicks when circuit operated. NO substitute relay available to the Technician. • Circuit diagram for the vehicle / circuit.

Vehicle/rig/other	• Vehicle or rig (electrical circuit board)
Tools and equipment list	• Multimeter with DC volts • Circuit diagram for the vehicle/circuit • Work bench • Well-lit area • Technician marking sheet

Marking of task

Correct answers	Identify the correct wiring / component fault.

Required to pass task
100%

Module	Electrical
Task	Ele - 04
Task Title	Circuit Relay Fault
Time - mins	10 Minutes

Technician Instructions	You are asked to diagnose an electrical circuit fault (as identified by your assessor) to a circuit that does not function correctly. The fuse to the circuit has been checked correctly, the fuse is OK and supplying the circuit with voltage. The component (consumer) has already been checked and also OK. It is suspected that the relay to the circuit is not operating correctly.	**OFFICIAL USE ONLY**
	Fault with circuit wiring / relay: …… ……..	
	Correct circuit function faulty component / circuit – OFFICE USE ONLY	
Assessor signature		
Date of Completion		

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.	

Technician Name:

Date:

Electrical: Sub-Group C

Sub-Group	**Electrical** Technician must complete 1 task from **each** sub-group
A	Electrical wiring fault (1)
B	Resistance check
	Circuit produce – relay
	Circuit relay fault
C	Fault code diagnosis
	CAN network fault
	Electrical wiring fault (2)
D	Oscilloscope measurement
	Oscilloscope waveform ID
	Wiring diagram identification

Trainer Guidance: Electrical 05

Module	Electrical
Task	Ele - 05
Task Title	Fault Code Diagnosis
Time – mins	10
NOS ref	IMIAEME106

Technician Instructions	A technician has retrieved the fault code P0118 for an 'Engine Coolant Temperature' sensor indicating 'high voltage'. Diagnose the circuit indicating whether the component or the wiring harness is faulty **(*= delete as applicable)** A: Wiring harness fault – open circuit* B: Wiring harness fault – short circuit* C: Component fault – ECU* D: Component fault – Engine Coolant Temperature sensor*

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.

Set up of task	• Petrol engine vehicle. • Access to the engine coolant temperature sensor and harness plug. • Access to the Engine Control ECU and harness plug. • Open circuit to the engine coolant temperature sensor signal wire.

Vehicle/rig/other	• Petrol engine vehicle
Tools and equipment list	• Multimeter • Fault code reader with correct software to communicate • Various electrical connector/test leads • Well-lit area/inspection lamp • Technician marking sheet

Marking of task

Correct answers	Wiring harness fault – open circuit*
	Correct safe working practices
	Correct PPE used for task

Required to pass task
100%

Module	Electrical
Task	Ele - 05
Task Title	Fault Code Diagnosis
Time - mins	10 Minutes

Technician Instructions	A technician has retrieved the fault code P0118 for an "Engine Coolant Temperature" sensor indicating 'voltage high'. Diagnose the circuit indicating whether the component or the wiring harness is faulty **(* = delete as applicable)**	**OFFICIAL USE ONLY**
	Wiring harness fault - open circuit *	
	Wiring harness fault - short circuit *	
	Component fault - ECU *	
	Component fault - Engine Coolant Temperature sensor *	
	Safe working practices – OFFICE USE ONLY	
	PPE used for task – OFFICE USE ONLY	
Assessor signature		
Date of Completion		

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.	

Technician Name:

Date:

Trainer Guidance: Electrical 06

Module	Electrical
Task	Ele - 06
Task Title	CAN Network Fault
Time – mins	10
NOS ref	IMIAEME106

Technician Instructions	You have been asked to diagnose a vehicle network fault. Check the fault code/live data from the scan tool and/or use other forms of diagnostic technique(s) to make a diagnosis as to the possible fault(s) from the list of faults below **(* = delete as appropriate)**: Short to ground (both CAN wires) * Short to positive * No communication from Body Control Module * Erratic CAN signal * Short to ground (one CAN wire) *

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.

Set up of task	• Ground 'both' CAN wires • Vehicle fitted with CAN that generates fault code to suit fault. • Ensure that the scan tool is in correct working order and communicates with the CAN system - fault codes & live data presented to Technician. • Removal of trims where appropriate. • Allow access of the CAN wiring easily accessible.

Vehicle/rig/other	• Vehicle/rig – with CAN
Tools and equipment list	• Scan tool with correct software to system to enable the following live data to be read; communication with various control units. • Multimeter (digital) • Selection of hand tools to suit task • Clipboard • Well-lit workshop area • PPE

Marking of task

Correct answers	Correct identification of CAN wiring connected to earth
	Correct safe working practices
	Correct PPE used for task

Required to pass task
100%

Module	Electrical
Task	Ele - 06
Task Title	CAN network fault
Time - mins	10 Minutes

Technician Instructions	You have been asked to diagnose a vehicle network fault. Check the fault code/live data from the scan tool and/or use other forms of diagnostic technique(s) to make a diagnosis as to the possible fault(s) from the list of faults below **(* = delete as appropriate)**:	**OFFICIAL USE ONLY**
	Short to ground (both CAN wires) *	
	Short to positive *	
	No communication from Body Control Module *	
	Erratic CAN signal *	
	Short to ground (one CAN wire) *	
	Safe working practices – OFFICE USE ONLY	
	PPE used for task – OFFICE USE ONLY	
Assessor signature		
Date of Completion		

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.	

Technician Name:

Date:

Trainer Guidance: Electrical 07

Module	Electrical
Task	Ele - 07
Task Title	Electrical Wiring Fault (2)
Time – mins	10
NOS ref	IMIAEME106

Technician Instructions	The brake & side light has stopped working. All the bulbs have been checked and the fault has been traced to the wiring between the light clusters. Diagnose the fault with the circuit using the tools and equipment provided and indicate the fault with the circuit from the list below **(* = delete as applicable, note there may be more than one different circuit fault)**: A: Wiring harness fault - high resistance between the NS & OS rear light clusters. * B: Wiring harness fault - short circuit before the bulb holder * C: Wiring harness fault - open circuit between the NS & OS rear light clusters. * D: High level brake light short circuit * E: Short circuit to the OS stop lamp bulb holder *

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.

Set up of task	• Brake lamp fuse is blown. • Open circuit within the wiring between the NS & OS lamp clusters. • High resistance to the circuit within the wiring between the NS & OS lamp clusters (to the point that the bulb does not illuminate.

	• Removal of boot/luggage/tailgate/boot lid trim(s) to allow easy access to wiring harness. • High resistance in the circuit sufficient to illuminate an LED test lamp at the bulb holder. • Vehicle information to be located on workbench. • Electrical test equipment to be located on workbench.

Vehicle/rig/other	• Vehicle or electrical rig.
Tools and equipment list	• Multimeter including amps clamp • LED test lamp / circuit tester • Vehicle Information - Electrical wiring diagram • Vehicle Information - Component location(s) • Various electrical connector / test leads • Well-lit area / inspection lamp • Technician marking sheet • PPE

Marking of task

Correct answers	Correct - Open circuit to side light / stop lamp circuit.
	Correct - High resistance to side light / stop lamp circuit.
	Correct safe working practices
	Correct PPE used for task

Required to pass task
100%

Module	Electrical
Task	Ele - 07
Task Title	Electrical Wiring Fault (2)
Time - mins	10 Minutes

Technician Instructions	The brake & side light has stopped working. All the bulbs have been checked and the fault has been traced to the wiring between the light clusters. Diagnose the fault with the circuit using the tools and equipment provided and indicate the fault with the circuit from the list below **(* = delete as applicable, note there may be more than one different circuit fault)**:	**OFFICIAL USE ONLY**
	Wiring harness fault - high resistance between the NS & OS rear light clusters *	
	Wiring harness fault - short circuit before the bulb holder *	
	Wiring harness fault - open circuit between the NS & OS rear light clusters *	
	High level brake light short circuit *	
	Short circuit to the OS stop lamp bulb holder *	
	Safe working practices – OFFICE USE ONLY	
	PPE used for task – OFFICE USE ONLY	
Assessor signature		
Date of Completion		

Technician Name:

Date:

Electrical: Sub-Group D

Sub-Group	**Electrical** Technician must complete 1 task from **each** sub-group
A	Electrical wiring fault (1)
B	Resistance check
	Circuit produce – relay
	Circuit relay fault
C	Fault code diagnosis
	CAN network fault
	Electrical wiring fault (2)
D	Oscilloscope measurement
	Oscilloscope waveform ID
	Wiring diagram identification

Trainer Guidance: Electrical 08

Module	Electrical
Task	Ele - 08
Task Title	Oscilloscope Measurement
Time – mins	10
NOS ref	IMIAEME106

Technician Instructions	To identify various electrical signals to actuators it is necessary to check the opening period or various voltages within that control signal. You are asked to check an injector waveform for the following: A. Injector opening period in milliseconds = B. The peak voltage of the injector control signal =

Additional information to the Technician	Use the oscilloscope and its measuring function to determine the components of the waveform (ask assessor if not used test equipment prior to assessment).

Set up of task	• Petrol engine vehicle. • Oscilloscope connected to an injector lead control signal terminal. • Oscilloscope configured to the correct settings. • Ensure that the engine temperature is at the correct operating temperature with ALL tests.

Vehicle/rig/other	• Petrol engine vehicle.
Tools and equipment list	• Oscilloscope • Various electrical connector/test leads • Well-lit area – inspection lamp • Technician marking sheet

Marking of task

Correct answers	Correct injection duration +/- 10ms
	Correct injection control signal peak voltage +/- 10 volts

Required to pass task
100%

Module Electrical
Task Ele - 08
Task Title Oscilloscope Measurement
Time - mins 10 Minutes

Technician Instructions	To identify various electrical signals to actuators it is necessary to check the opening period or various voltages within that control signal. You are asked to check an injector waveform for the following:	**OFFICIAL USE ONLY**
	Injector opening period in milliseconds =	
	The peak voltage of the injector control signal =	
Assessor signature		
Date of Completion		

Additional information to the Technician	Use the oscilloscope and its measuring function to determine the components of the waveform (ask assessor if not used test equipment prior to assessment)	

Technician Name:

Date:

Trainer Guidance: Electrical 09

Module	Electrical
Task	Ele - 09
Task Title	Oscilloscope Waveform ID
Time – mins	10
NOS ref	IMIAEME106

Technician Instructions	To identify the "component" sensor or actuator signal from the oscilloscope waveform illustrations provided. From the five illustrations, identify which of the common oscilloscope waveforms / patterns relate to the letters (A, B, C, D and E). Mark the component signal aligned to the illustration letter below. A. B. C. D. E.

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.

Set up of task	• Illustration of different oscilloscope waveform types to be laid out to the Technician. • Centre to choose the waveforms from the waveform list provided opposite. • Laminate the illustrations on A4 paper and make up a document set either in a folder or bound/linked. • Clearly identify on 'each' illustration the letter.

Vehicle/rig/other	• No vehicle or rig needed.
Tools and equipment list	• 5 pictures laminated and labelled • Technician marking sheet

Marking of task

Correct answers	5 correctly labelled pictures from the list below.
Image A	Injector (petrol)
Image B	Crankshaft Position/Engine Speed Sensor (inductive)
Image C	Oxygen Sensor (Zirconia)
Image D	Camshaft Position Sensor (inductive)
Image E	Mass Air Flow Sensor - Hot wire
Image F	Ignition Secondary circuit
Image G	Knock Sensor
Image H	CAN network
Image I	Accelerator Pedal Position Sensor
Image J	MAP Sensor
Image K	Wheel Speed Sensor (analogue)
Image L	Wheel Speed Sensor (digital)

Required to pass task
100%

Module	Electrical
Task	Ele - 09
Task Title	Oscilloscope Waveform ID
Time - mins	10 Minutes

Technician Instructions	To identify the "component" sensor or actuator signal from the oscilloscope waveform illustrations provided. From the five illustrations, identify which of the common oscilloscope waveforms / patterns relate to the letters. Mark the component signal aligned to the illustration letter below.	**OFFICIAL USE ONLY**
	Letter: Component:	
	Letter: Component:	
	Letter: Component:	
	Letter: Component:	
	Letter: Component:	
Assessor signature		
Date of Completion		

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.	

Technician Name:

Date:

Trainer Guidance: Electrical 10

Module	Electrical
Task	Ele - 10
Task Title	Wiring Diagram Identification
Time – mins	10
NOS ref	IMIAEME106

Technician Instructions	Using the multi-circuit wiring diagram illustration provided, list the circuit components in the illustration "that relate" to the circuit identified by your assessor. Identify the "power supply circuit" and the "earth circuit" (identified by your assessor) by using highlighters on the illustration. Identify the colour of the wires on the diagram using the legend provided.

Additional information to the Technician	Please ask your assessor if you require assistance with the tools and equipment provided.

Set up of task	• Multi circuit wiring diagram (min of three circuits on one wiring diagram). • Selection of coloured highlighters (3 min). • Wiring diagram key / legend. • Vehicle information / diagrams etc. to be located on workbench.

Vehicle/rig/other	• Wiring diagram
Tools and equipment list	• Colour highlighters • Well-lit area • Technician marking sheet

Marking of task

Correct answers	Correct components identified
	Power/earth circuits identified

Required to pass task
100%

Module Electrical
Task Ele - 10
Task Title Wiring Diagram Identification
Time - mins 10 Minutes

Technician Instructions	Using the 'multi-circuit' wiring diagram illustration provided: A: List the circuit components in the illustration "*that relate*" to the circuit identified by your assessor. B: Identify the "power supply circuit" and the "earth circuit" (identified by your assessor) by using highlighters on the illustration. C: Identify the colour of the wires on the diagram using the legend provided.	**OFFICIAL USE ONLY**
	All components listed – OFFICE USE ONLY	
	Live side of circuit correctly identified – OFFICE USE ONLY	
	Earth side of circuit correctly identified – OFFICE USE ONLY	
	Wiring colours identified correctly – OFFICE USE ONLY	
Assessor signature		
Date of Completion		

Technician Name:

Date:

Appendix 2: Resource Requirements

Suspension, Steering, Wheels & Tyres

Task	Task Title	Vehicle/rig/other	Tools and equipment list
Sus – 01	Tyre Wear	No vehicle or rig needed	• Two physical wheel / tyre assemblies • Illustrations laminated and labelled A to E* • Technician marking sheet
Sus – 02	Inspection of Vehicle Front Suspension (1)	Vehicle	• Selection of levers - suitable to achieve the outcome of the task • Selection of hand tools to suit task • Clipboard • Inspection lamp • PPE
Sus – 03	Inspection of Vehicle Front Suspension (2)	Vehicle with front wishbone type suspension only can be used on this task.	• Selection of levers – suitable to achieve the outcome of the task • Selection of hand tools to suit task • Clipboard • Inspection lamp • PPE
Sus – 04	Steering	Vehicle	• Selection of hand tools to suit task • Clipboard • Inspection lamp and well-lit area of workshop • PPE
Sus – 05	Anti-roll bar links / brushes	Vehicle only	• Clipboard • Inspection lamp • PPE

Task	Task Title	Vehicle/rig/other	Tools and equipment list
Sus – 06	Inspection of Vehicle Rear Suspension	Vehicle with rear independent suspension can only be used on this task	• Selection of levers - suitable to achieve the outcome of the task • Selection of hand tools to suit task • Clipboard • Inspection lamp • PPE
Sus – 07	Suspension Component Inspection	Rig only	• Selection of levers - suitable to achieve the outcome of the task • Selection of hand tools to suit task • Clipboard • Inspection lamp • PPE
Sus – 08	Steering Mechanism – Vague Steering	Vehicle with steering rack without or with PAS	• Selection of lever bars • Selection of hand tools to suit the task • Clipboard • Inspection lamp • PPE
Sus – 09	Steering Mechanism – Stiff Steering	Vehicle or rig with steering rack/box (without or with PAS)	• Selection of levers bars • Selection of hand tools to suit the task • Clipboard • Inspection lamp and a well-lit area of workshop • PPE
Sus – 10	Steering Mechanism Check	Vehicle without PAS	• Selection of hand tools to suit the task • Clipboard • Inspection lamp and well-lit area of workshop

Task	Task Title	Vehicle/rig/other	Tools and equipment list
			• PPE

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Brakes

Task	Task Title	Vehicle/rig/other	Tools and equipment list
Bra - 01	Disc - Measurement	Rig	• Work bench • Selection of hand tools to suit task • Clipboard • Inspection lamp/well-lit workshop area • Micrometer to measure the thickness of the disc • Dial Test Indicator gauge and mounts to check the run out
Bra - 02	Brake Servo	Vehicle/Rig	• Petrol or diesel engine vehicle • Clipboard • Inspection lamp
Bra - 03	ABS fault (1)	Vehicle/Rig	• Work bench • Selection of hand tools to suit task • Clipboard • Inspection lamp • Multimeter • Additional wiring/harness to create a temporary harness to check continuity of the wiring

Task	Task Title	Vehicle/rig/other	Tools and equipment list
Bra - 04	ABS Fault (2)	Vehicle/Rig	• Work bench • Selection of hand tools to suit task • Clipboard • Inspection lamp • Multimeter • Oscilloscope with the correct set up according to the waveform/signal voltage
Bra - 05	Brake Fluid	n/a	• Brake fluid tester. This can be either equipment that registers the exact boiling point or a red/amber/green brake fluid tester • Cleaning cloth and absorbent materials • Clipboard • Inspection lamp • PPE
Bra - 06	Brake Pipe Fabrication	n/a	• Work bench • Vice fitted securely to the workbench • Selection of hand tools to suit task • Tape measure • Clipboard • Well-lit area of the workshop • Roll of copper brake pipe 3/8 • Brake pipe flaring kit in packaging (opened and fully stocked) • Supply of brake pipe unions to suit brake pipe (internal/external)

Task	Task Title	Vehicle/rig/other	Tools and equipment list
			• Torque wrench – selection of (if applicable to brake pipe flaring kit) • Grease/oil • Manufacturer of equipment instructions/specs
Bra - 07	Brake Pipe/Brake Hose Inspection	Vehicle/rig	• Brake pipe corrosion tool • Selection of hand tools to suit task • Clipboard • Inspection lamp • Well-lit workshop area • PPE
Bra - 08	Disc Caliper	Vehicle/Rig	• Work bench • If applicable - vice fitted to workbench that allows caliper / disc assembly to be held securely • Selection of hand tools to suit task • Clipboard • Inspection lamp • Torque wrench - selection of • Manufacturer instructions / specs
Bra - 09	Handbrake – Not Functioning	Vehicle/Rig	• Work bench • Selection of hand tools to suit task • Clipboard • Inspection lamp
Bra - 10	Brake Drum Inefficient	Vehicle/Rig	• Work bench • Selection of hand tools to suit task • Clipboard

Task	Task Title	Vehicle/rig/other	Tools and equipment list
			• Inspection lamp

Emissions

Task	Task Title	Vehicle/rig/other	Tools and equipment list
Emi - 01	Live Data – Analyse Data	Vehicle/Rig – petrol engine	• Scan tool • Work bench • Well-lit workshop area • Technician marking sheet
Emi – 02	Emission Tester	Vehicle/Rig – petrol engine	• Exhaust Gas analyser with print out facility • Exhaust extraction system securely fitted to exhaust tailpipe • Selection of hand tools to suit task • Clipboard • Well-lit workshop area • PPE
Emi – 03	Emission Test Sample	No vehicle or rig needed.	• 5 pictures laminated and labelled A to E • Technician marking sheet
Emi – 04	Petrol Injector Fault	Vehicle/Rig – petrol/diesel engine.	• Scan tool with correct software to vehicle Engine Management system restricted to live data only • Oscilloscope • Multimeter (with duty cycle/injector duration)

Task	Task Title	Vehicle/rig/other	Tools and equipment list
			• Exhaust extraction system securely fitted to exhaust tailpipe • Selection of hand tools to suit task • Clipboard • Well-lit workshop area • PPE
Emi – 05	O2 Sensor – Data (1)	Vehicle/Rig – petrol engine.	• Scan tool with correct software to system • Exhaust extraction system securely fitted to exhaust tailpipe • Selection of hand tools to suit task • Clipboard • Well-lit workshop area • PPE
Emi – 06	O2 Sensor – Data (2)	Vehicle/rig – petrol engine.	• Scan tool with correct software to system • Exhaust extraction system securely fitted to exhaust tailpipe • Selection of hand tools to suit task • Clipboard • Well-lit workshop area • PPE
Emi – 07	Scan Tool Data	Vehicle/Rig – petrol/diesel engine.	• Scan tool with correct software to system • Exhaust extraction system securely fitted to exhaust tailpipe • Selection of hand tools to suit task • Clipboard

Task	Task Title	Vehicle/rig/other	Tools and equipment list
			• Well-lit workshop area • PPE
Emi – 08	Fuel System	Vehicle/Rig – naturally aspirated diesel engine.	• Scan tool connected to engine with data list selected • Exhaust extraction system securely fitted to exhaust tailpipe • Selection of hand tools to suit task • Clipboard • Well-lit workshop area • PPE
Emi – 09	Engine Non-Start (1)	Vehicle/Rig – petrol/diesel (common rail) engine	• Container to accept fuel • Ignition/spark neon/LED light tester to measure HT voltage • Scan tool with correct software to vehicle Engine Management system to allow access to live data • Multimeter • Selection of hand tools to suit task • Clipboard • Well-lit workshop area • PPE
Emi - 10	Engine Non-Start (2)	Vehicle/Rig – petrol engine	• Vehicle workshop manual (electrical wiring diagram + fuse location) • Ignition, spark neon or LED light tester to measure HT voltage

Task	Task Title	Vehicle/rig/other	Tools and equipment list
			• Scan tool with correct software to vehicle Engine Management system to allow access to live data • Multimeter • Selection of hand tools to suit task • Clipboard

Electrical

Task	Task Title	Vehicle/rig/other	Tools and equipment list
Ele - 01	Electrical Wiring Fault (1)	Vehicle or electrical rig	• Multimeter • LED test lamp/circuit tester • Vehicle Information – Electrical wiring diagram • Vehicle Information – Component location(s) • Various electrical connector/test leads • Well-lit area of workshop/inspection lamp • Technician marking sheet • PPE
Ele – 02	Resistance Check	No vehicle or rig needed	• 5 wires, labelled A-E, laid out on workbench • Workbench • Well-lit area • Technician marking sheet
Ele – 03	Circuit Produce - Relay	No vehicle or rig needed – electrical circuit board	• Multimeter with DC volts • Workbench

Task	Task Title	Vehicle/rig/other	Tools and equipment list
			• Well-lit area • Technician marking sheet
Ele – 04	Circuit Relay Fault	Vehicle or rig (electrical circuit board)	• Multimeter with DC volts • Circuit diagram for the vehicle/circuit • Work bench • Well-lit area • Technician marking sheet
Ele – 05	Fault Code Diagnosis	Petrol engine vehicle	• Multimeter • Fault code reader with correct software to communicate • Various electrical connector/test leads • Well-lit area/inspection lamp • Technician marking sheet
Ele – 06	CAN Network Fault	Vehicle/rig – with CAN	• Scan tool with correct software to system to enable the following live data to be read; communication with various control units. • Multimeter (digital) • Selection of hand tools to suit task • Clipboard • Well-lit workshop area • PPE
Ele – 07	Electrical Wiring Fault (2)	Vehicle or electrical rig	• Multimeter including amps clamp • LED test lamp / circuit tester • Vehicle Information - Electrical wiring diagram • Vehicle Information - Component location(s)

Task	Task Title	Vehicle/rig/other	Tools and equipment list
			• Various electrical connector / test leads • Well-lit area / inspection lamp • Technician marking sheet • PPE
Ele – 08	Oscilloscope Measurement	Petrol engine vehicle	• Oscilloscope • Various electrical connector/test leads • Well-lit area – inspection lamp • Technician marking sheet
Ele – 09	Oscilloscope Waveform ID	No vehicle or rig needed	• 5 pictures laminated and labelled A – E* • Technician marking sheet
Ele - 10	Wiring Diagram Identification	Wiring diagram	• Colour highlighters • Well-lit area • Technician marking sheet

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