

Jersey Progression Qualification in Automotive Studies

ncfe. h Highlands
College

The Jersey Progression Qualification is a partnership initiative between:

States of Jersey

Department of Education

PO Box 142

Highlands Campus

Jersey

JE4 8QJ

Tel: 01534 445504

Email: esc@gov.je

Highlands College

Highlands Lane

St Saviour

Jersey

Channel Islands

JE1 1HL

Tel: 01534 608608

Email: info@highlands.ac.uk

Website: www.highlands.ac.uk

NCFE

Q6

Quorum Business Park

Benton Lane

Newcastle upon Tyne

NE12 8BT

Tel: 0191 239 8000

Fax: 0191 239 8001

Email: service@ncfe.org.uk

Website: www.ncfe.org.uk

All the material in this publication is copyright

© 2017

States of Jersey and Highlands College

Contents

Section A Qualification: Context and Regulations	4
Introduction	6
About this qualification	8
Qualification purpose.....	8
Entry guidance	9
Qualification structure.....	9
Grading	10
Unit grading.....	11
Overall unit grade.....	12
Pass only criteria	13
Qualification grading.....	13
Overall grading descriptors	16
How the qualification is assessed	17
Course-based assessment.....	17
Standardisation	19
External verification	19
Awarding	19
Assessment regulations	21
Extenuating circumstances	22
Compensation	22
Student academic appeal procedure.....	24
Academic malpractice policy	24
Access arrangements and reasonable adjustments.....	25
Section B Unit Content and assessment guidance	26
Structure of the Jersey Progression Qualification in Automotive Studies.....	28
Unit 1 – Routine Engine Maintenance and Servicing	29
Unit 2 – Health and Safety in the Automotive Environment.....	33
Unit 3 – Routine Vehicle Maintenance and Servicing.....	37
Unit 4 – Working in the Industry	41
Unit 5 – Four-stroke Engine Technology.....	46
Unit 6– Use of Workshop Tools and Equipment.....	50
Unit 7– Low Carbon Technologies	54

Unit 9– Steering Systems and Tyre Technology for Light Vehicles	63
Unit 10– Light Vehicle Braking Systems.....	68
Appendices	74
Appendix I - Extenuating Circumstances Form	76
Appendix II - Candidate Appeal Form	78
Appendix III – Assessment Brief Template.....	80
Appendix IV – Assessment Brief Internal Verification Template.....	82
Appendix V– Internal Verification Template for Assessment Decisions	84

Section A

Qualification:

Context and

Regulations

Introduction

The Jersey Progression Qualification (JPQ) was introduced at Highlands College in September 2016 as a pilot project. The development of this qualification at level 2 has significantly improved the life chances of young people by ensuring that a greater proportion of school leavers progress from level 1 achievement at school to level 2 courses in the college. In 2014, 20.4% of full-time students were enrolled on level 1 or entry level qualifications. In 2017, since the introduction of the Jersey Progression Qualification, this has reduced significantly to 5.9% of full-time students on level 1/entry courses.

The Jersey Progression Qualification provides a coherent framework for teaching, learning and assessment that will inspire and motivate young people, post 16, who have not met the minimum school leaving attainment level of GCSE grade C or grade 4 or above in five subjects (or an equivalent pass or higher in a comparable level 2 vocational qualification). For the majority of jobs in occupations which require a technical qualification, the minimum requirement is a level 2 technical qualification. For higher education and those occupations requiring a general qualification, the minimum requirement is a level 3 general qualification.

The primary purpose of the **Jersey Progression Qualification** is to enable young people aged 16-18 to develop the knowledge and skills, commensurate with the school leaving threshold of level 2, that will enable them to progress to the industry standard qualifications in a technical, professional or academic subject area. Students that have yet to achieve a result at level 2 continue with English and maths at GCSE level alongside the Jersey Progression Qualification.

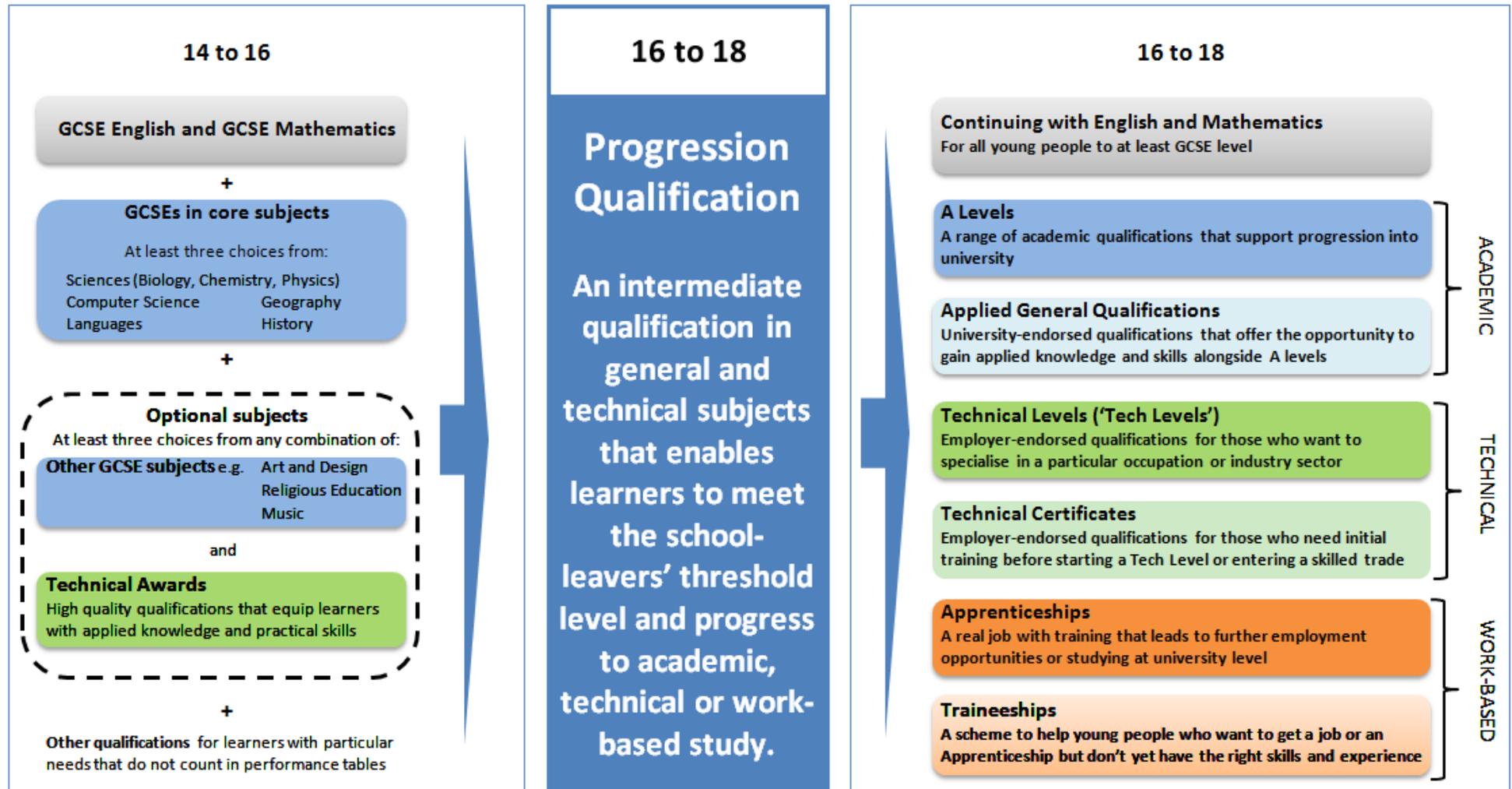
The Jersey Progression Qualification is designed as a 'bridging course', between school leaving qualifications and recognised post-16 qualifications, that have transportability, both on and off the island, to further training, employment or higher education. The development and implementation of the **Jersey Progression Qualification** pre-empted the recommendation of the Sainsbury Report into Technical Education ¹ to introduce a *transition year* that will serve a very similar purpose in England from 2020. At Key Stage 4, the Jersey Curriculum has adopted and adapted the English National Curriculum and this approach has followed through into Key Stage 5.

The Jersey Progression Qualification has been developed with the support of the States of Jersey Department of Education and in partnership with the awarding body NCFE. It is intended to develop transferable skills and knowledge through an applied subject and with reference to a realistic working environment. The qualification will provide the means by which young people can develop the level of knowledge, skills and understanding necessary in order to progress to one of the recognised further education routes outlined in the diagram on the following page.

1

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/536046/Report_of_the_Independent_Panel_on_Technical_Education.pdf

New Routes to University, an Apprenticeship or Employment



About this qualification

The Level 2 Jersey Progression Certificate and Jersey Progression Diploma is regulated by the States of Jersey Education Department and accredited by the NCFE awarding body.

- The Progression Certificate is equivalent to **two** GCSEs at grades A* to C (or grades 4 to 9) in terms of standard, level of content and period of study (240 guided learning hours).
- The Progression Diploma is equivalent to **four** GCSEs at grades A* to C (or grades 4 to 9) in terms of standard, level of content and period of study (480 guided learning hours).

The Jersey Progression Qualification has fourteen subject lines which are in:

- 1) Automotive Studies
- 2) Art and Design
- 3) Building Services
- 4) Building Trades
- 5) Business
- 6) Childcare and Education
- 7) Computing
- 8) Culinary Skills and Restaurant Service
- 9) Hair and Beauty
- 10) Health and Social Care
- 11) Mechanical Engineering and Welding Studies
- 12) Media
- 13) Performing Arts
- 14) Sport.

Qualification purpose

The Jersey Progression Qualification enables learners to develop skills, knowledge and understanding in a technical or general vocational subject area. It is for learners who are motivated and challenged by learning through hands-on experiences. The qualification will allow learners to gain practical skills in one of 14 subject areas as well as gain and interpret knowledge of that subject area. It is aimed at school leavers, with an interest in the subject, as a way of extending their general level of education and motivating them to succeed as independent learners.

The Jersey Progression Qualification provides an introduction to an industry-related sector and enables learners to acquire, develop and apply the skills and knowledge required for further academic and/or technical study. Transferable skills that prepare young people for satisfying working and social lives are a core component in the way that the qualification is delivered. Throughout the course learners will be:

- reviewing their own and others' work
- developing and honing their communication skills
- gaining valuable work experience
- developing their personal and social skills
- planning and experimenting with ideas
- working collaboratively with others
- fully aware of health and safety requirements.

The Jersey Progression Qualification is designed so that learners can improve their level of general qualification through a work-related subject. It will enhance their cognitive skills and develop their practical skills so that they are more likely to be successful in achieving level 2/3 technical qualifications or level 3 general qualifications when they progress. Learners without at least a grade C or grade 4 in maths and English at GCSE will take these subjects alongside the Progression Qualification.

Entry guidance

There are no specific recommended prior learning requirements for this qualification. It should be accessible for post-16 learners who are able to demonstrate an aptitude for and an interest in the particular technical and professional area. An indicator for learners likely to achieve the Diploma within one year is prior achievement in at least 5 GCSEs at grades E to C (or 2 to 4) and/or level 1 (120 guided learning hours) vocational equivalent qualifications. Learners with a mixture of GCSE grades from D to G are more likely to achieve the Certificate in one year.

Qualification structure

The Jersey Progression Certificate and **Jersey Progression Diploma** reflect the range and depth of subject matter and skills that need to be taught at pre-technical level or pre-advanced general level.

The Jersey Progression Qualification is structured so that the smaller **Jersey Progression Certificate** is 'nested' within the larger **Jersey Progression Diploma**.

The Jersey Progression Certificate requires learners to achieve **five units**, **two** of which must be **core** units and **the Jersey Progression Diploma** requires learners to achieve a further **five units**, **two** of which must be **core** units.

The Jersey Progression Certificate is a standalone five-unit qualification. **The Jersey Progression Diploma** is a ten-unit qualification which has the Jersey Progression Certificate 'nested' within it.

The sequencing of units is at the discretion of the course team, but the synoptic units (units 1 and 3) should normally be taught and assessed subsequent to the teaching and assessment of the other units.

The content and assessment of a unit is designed to be covered in 48 guided hours. **The Jersey Progression Certificate**, structured around five units, requires **240 guided hours** of teaching and assessment. There is an assumption that a further **160 hours of learning** will take place in addition to the 240 hours of teaching and assessment in the form of research, private study, workshop practice, rehearsals and assignment or project preparation and writing. The 240 guided hours gives equivalency to two GCSEs in terms of the time required to acquire knowledge, understanding and skills at level 2.

The Jersey Progression Diploma builds on the five-unit structure of the Jersey Progression Certificate and requires a further **240 guided hours** of teaching and assessment. There is an assumption that a further **160 hours of learning** will take place in addition to the 240 hours of teaching and assessment in the form of research, private study, workshop practice, rehearsals and assignment or project preparation and writing. The 240 guided hours from the Jersey Progression Certificate plus the additional 240 guided hours that make up the Jersey Progression Diploma (total 480 guided hours) gives equivalency to four GCSEs in terms of the time required to acquire knowledge, understanding and skills at level 2.

JERSEY PROGRESSION QUALIFICATION STRUCTURE							
1 or 3	CORE UNIT	48 hours	P L U S	1 or 3	CORE UNIT	48 hours	
2 or 4	CORE UNIT	48 hours		2 or 4	CORE UNIT	48 hours	
5	Any THREE option units	48 hours		8	Any THREE option units	48 hours	
6		48 hours		9		48 hours	
7		48 hours		10		48 hours	
Total Guided Hours		240			Total Guided Hours		240
JERSEY PROGRESSION CERTIFICATE					JERSEY PROGRESSION DIPLOMA		

The assessment opportunities in the **Jersey Progression Certificate** and **Jersey Progression Diploma** are designed to enable learners to demonstrate that they:

- a) have acquired the taught skills to an expected minimum level
- b) have gained sufficient practical and theoretical knowledge of the technical and professional area
- c) can demonstrate their understanding of the subject content
- d) are aware of what is required by the sector in which they are interested
- e) can behave appropriately when working within the specific technical and professional area.

To be awarded **the Level 2 Jersey Progression Certificate**, learners are required to successfully complete **two core units** and **three option units**. Learners must successfully demonstrate their achievement of all learning outcomes in the required units as detailed in this qualification specification. Unit certificates can be awarded to learners who have not achieved the full qualification, but who have achieved at least one unit.

To be awarded **the Level 2 Jersey Progression Diploma**, learners are required to successfully complete a further **two core units** and a further **three option units**. Learners must successfully demonstrate their achievement of all learning outcomes in the required units as detailed in this qualification specification.

Grading

The Jersey Progression Certificate and Diploma are graded qualifications. The grades for individual units are recorded on the final certificate, but there is **one** overall grade of Pass, Merit, Distinction, or Distinction* awarded for the Certificate and a **second** overall grade of Pass, Merit, Distinction, or Distinction* awarded for the Diploma. The grade of Distinction* is awarded if all the units are achieved at Distinction level.

Grading descriptors for each learning outcome and each unit have been included in this qualification specification. Assessors must be confident that all the learning outcomes have been evidenced and met by the learner in order to pass the unit. Assessors will judge the evidence produced by the learner to determine the grade for the unit.

Pass, Merit and Distinction Grades are awarded for the **Jersey Progression Certificate** at unit level and these are converted to **one** overall grade for the five units (2 core and 3 option) that contribute to the award of this qualification.

Similarly, Pass, Merit and Distinction Grades are awarded for the remaining five units that make up the **Jersey Progression Diploma** at unit level and these are converted to a **second** overall grade for the qualification for the remaining five units (2 core and 3 option) that contribute to the award of this qualification.

The Jersey Progression Certificate is awarded with **one** overall grade of Pass, Merit, Distinction or Distinction*.

The Jersey Progression Diploma is awarded with the **one** overall grade of Pass, Merit, Distinction or Distinction* achieved through the units that make up the Certificate and a **second** overall grade of Pass, Merit, Distinction or Distinction* achieved through the remaining units that make up the Diploma.

Distinction* is only awarded where all units are achieved at Distinction level.

Unit grading

The grading descriptors for each unit are included in the qualification specification. Grading descriptors are written for each assessment criterion in a unit. Assessors must be confident that, as a minimum, all assessment criteria have been evidenced and met by the learner. Assessors must make a judgement on the evidence produced by the learner to determine the grading decision for the unit. Grading is initially carried out at the learning outcome level.

Assessors must firstly be confident that all the Pass descriptors have been met for a learning outcome.

For example:

Pass:	LO1: Describes some characteristics and benefits of good customer service and some elements of legal requirements
--------------	---

Assessors can then move on to decide if the Merit descriptors have been met for the learning outcome.

For example:

Merit:	LO1: Describes a range of good customer service characteristics and benefits citing some examples and a range of legal requirements
---------------	---

If the Assessor is confident that all the Merit descriptors have been met, they can decide if the Distinction descriptors have been met for the learning outcome.

For example:

Distinction:	LO1: Describes a wide range of good customer service characteristics, benefits and legal requirements citing examples for each one
---------------------	--

Each unit has three grades which are equally weighted. If the learner has insufficient evidence to meet the Pass criteria, a grade of Not Yet Achieved (NYA) must be awarded for the unit.

Overall unit grade

The overall unit grade is determined by the highest average grade across the three learning outcomes. The overall unit grade will be determined from the following table:

LO1	LO2	LO3	Overall
P	P	P	P
P	P	M	P
P	P	D	M
P	M	P	P
P	M	M	M
P	M	D	M
P	D	P	M
P	D	M	M
P	D	D	M
M	P	P	P
M	M	M	M
M	M	P	M
M	M	D	M
M	D	D	D
M	P	M	M
M	P	D	M
M	D	D	D
D	P	P	M
D	M	M	M
D	M	P	M
D	M	D	D
D	D	M	D
D	D	D	D
D	P	M	M
D	P	D	M

Pass is a minimum requirement for all learning outcomes

Pass only criteria

When a learning outcome is **PASS** only, for example LO1, the criterion for LO1 applies to MERIT and DISTINCTION and the grade for LO1 defaults to the highest grade achieved for LO2 or LO3 in order to determine the overall unit grade.

For example:

	PASS	MERIT	DISTINCTION	Grade awarded
LO1	PASS ONLY	PASS ONLY	PASS ONLY	Defaults to DISTINCTION
LO2			Meets Distinction Criterion	DISTINCTION
LO3		Meets Merit Criterion		MERIT
LO1 = D; LO2 = D; LO3 = M (DDM = D)				DISTINCTION

A further example, where LO3 is pass only:

	PASS	MERIT	DISTINCTION	Grade awarded
LO1		Meets Merit Criterion		MERIT
LO2		Meets Merit Criterion		MERIT
LO3	PASS ONLY	PASS ONLY	PASS ONLY	Defaults to MERIT
LO1 = M; LO2 = M; LO3 = M (MMM = M)				MERIT

Qualification grading

The final grade for the qualification is based on the unit grades - Pass, Merit, and Distinction. It is arrived at according to the table below which shows how the combination of unit grades is aggregated to form the overall qualification grade for the Certificate and the Diploma.

An awarding panel will meet before the final grades are submitted to NCFE to consider special considerations and extenuating circumstances.

The **highest** possible grade is determined first. Units 1, 2, 3 and 4 are the **core** units of the qualification. Units 1 and 3 contain synoptic elements, unit 2 contains essential knowledge and skills and unit 4 is the **Working in the Industry** unit which is common to all subject strands. Units 5 and above are all option units. The **highest** overall grade is determined by:

1. Selecting the highest grade achieved for unit 1 or 3
2. Selecting the highest grade achieved for unit 2 or 4
3. Selecting the **three** highest grades achieved from the option units.

For example:

This is a candidate grade profile for all 10 units:

1	2	3	4	5	6	7	8	9	10
P	M	M	D	P	M	P	D	D	M

1. Between units 1 and 3, the highest grade achieved is for Unit 3: **MERIT**
2. Between units 2 and 4, the highest grade achieved is for Unit 4: **DISTINCTION**
3. The **three** highest grades achieved from the option units are for Units 8, 9 and 6 or 10: **DISTINCTION; DISTINCTION; MERIT**.

The five **highest** grades achieved in this example (arranged in the order with lowest grades first) are:

A	B	C	D	E
M	M	D	D	D

The final **highest** overall grade is aggregated according to the table below:

Unit A	Unit B	Unit C	Unit D	Unit E	Final overall grade
P	P	P	P	P	P
M	M	M	M	M	M
D	D	D	D	D	D*
P	P	P	P	M	P
P	P	P	P	D	P
P	M	M	M	M	M
M	M	M	M	D	M
P	D	D	D	D	D
M	D	D	D	D	D
P	P	P	M	M	P
P	P	P	D	D	M
P	P	M	M	M	M
M	M	M	D	D	M
P	P	D	D	D	M
M	M	D	D	D	D
P	P	P	M	D	M
P	M	M	M	D	M
P	M	D	D	D	M
P	P	M	M	D	M
P	P	M	D	D	M
P	M	M	D	D	M

These two grade profiles are only one grade different from the higher grade and should be reviewed at awarding.

From the table above, the example of a grade profile of **MMDDD** works out as an overall grade of **Distinction**.

A	B	C	D	E	OVERALL GRADE
M	M	D	D	D	D

Where **five** appropriate units have been achieved but less than 10 units have been fully achieved, just the Jersey Progression Certificate is awarded and the highest grade (Distinction, in this example) will be recorded on the certificate. A unit certificate for any additional units above the five used to grade the Certificate but fewer than five to contribute towards a Diploma will be issued. Where fewer than five units overall have been achieved, just a unit certificate will be awarded for the units achieved.

Once the **highest** overall grade has been determined, the remaining five units can be used to determine the **second overall grade** for the **Jersey Progression Diploma**. Using the example from above, the remaining unit grades that can be used to calculate the second overall grade are:

1	2	5	7	10
P	M	P	P	M

Rearranged in grade order, with the lowest first, gives a grade profile of **PPPM**. Using the final overall grade table from above, the **second overall grade** is a **Pass**.

Unit A	Unit B	Unit C	Unit D	Unit E	Final overall grade
P	P	P	M	M	P
These two grade profiles are only one grade different from the higher grade and should be reviewed at awarding.					

From the overall grade table, it will be noted that this particular profile is highlighted in red because it is a borderline grade. At the awarding stage there is an opportunity to review the grades for the units with a pass to ensure that the assessment is secure.

Where the learner has achieved ten units, as in the example above, they will receive **one overall grade** for the **Jersey Progression Certificate** and a **second overall grade** for the **Jersey Progression Diploma**. In the example above, the overall grades are Pass and Distinction. Where one grade is higher than the other, the lower grade should be assigned to the Jersey Progression Certificate (Pass) and the higher grade to the Jersey Progression Diploma (Distinction).

Distinction* (star) is awarded where all of the grades for the Certificate are Distinction. Double Distinction*(star) is awarded where all 10 units are graded Distinction.

Overall grading descriptors

Not Yet Achieved

The learner will not meet all the learning outcomes and will not have enough work or evidence of progress available to allow a valid judgement to be made.

Pass

To achieve a Pass grade the learner will meet all the requirements as set out in the assessment criteria for each unit. They will make some effort to apply knowledge, and have some understanding of key concepts, but may not be able to make links between them. The learner will have a general understanding of processes, resources, techniques and materials, but this may be uneven in application. Their evidence will show some degree of planning, organisational and investigatory skills, but may be lacking in structure.

The learner will have completed the tasks to the minimum standard for a level 2 qualification.

Merit

To achieve a Merit grade the learner will meet all the requirements as set out in the assessment criteria for each unit to the required standard. They will demonstrate a confident level of ability in their application of knowledge and skills and will have a clear understanding of key concepts, making some links between them and giving reasons for their choices. The learner will have a clear understanding of processes, resources, techniques and materials with few errors in application. Their evidence will show planning, organisation and investigatory skills in a clear and logical way.

The learner will have completed the tasks in a manner exceeding the minimum standard for a level 2 qualification.

Distinction

To achieve a Distinction grade the learner will meet all the requirements as set out in the assessment criteria for each unit to a high standard. They will demonstrate mastery of appropriate processes, resources, techniques and materials. The learner will demonstrate an ability to undertake relevant and wide-ranging research, analysing and evaluating information to make informed judgements. They will have a detailed understanding of processes, resources, techniques and materials showing independent ideas expressed with confidence and originality. Their evidence will be appropriately contextualised showing planning, organisation and investigatory skills in a well-structured and thorough way.

The learner will have shown a high degree of motivation, ability and commitment and will have completed the tasks effectively in a manner far exceeding the minimum standard for a level 2 qualification.

Distinction* (Star)

The learner will have achieved a Distinction grade for all units of the qualification demonstrating consistent work for a level 2 qualification.

How the qualification is assessed

Assessment is the process of measuring a learner's skill, knowledge and understanding against the standards set in a qualification. The assessment for the **Jersey Progression Qualification** is unit based. Each unit requires the learner to demonstrate that they have met the learning outcomes. Learning outcomes are assessed through a portfolio of evidence which can take a number of different forms. The assessment methods used are appropriate to the type of learning activity and tasks prescribed in the unit.

Assessment methods include:

- Assignments
- Project based work
- Written tests or examinations
- Practical tests or examinations
- Lecturer/assessor observation
- Audio/video recorded activities
- Interviews or a viva
- On-line assessment
- Portfolio of documentation
- Sketchbooks
- Video/audio diaries
- Workbooks
- Use of blogs or discussion forums
- Employer or customer/client feedback.

Course-based assessment

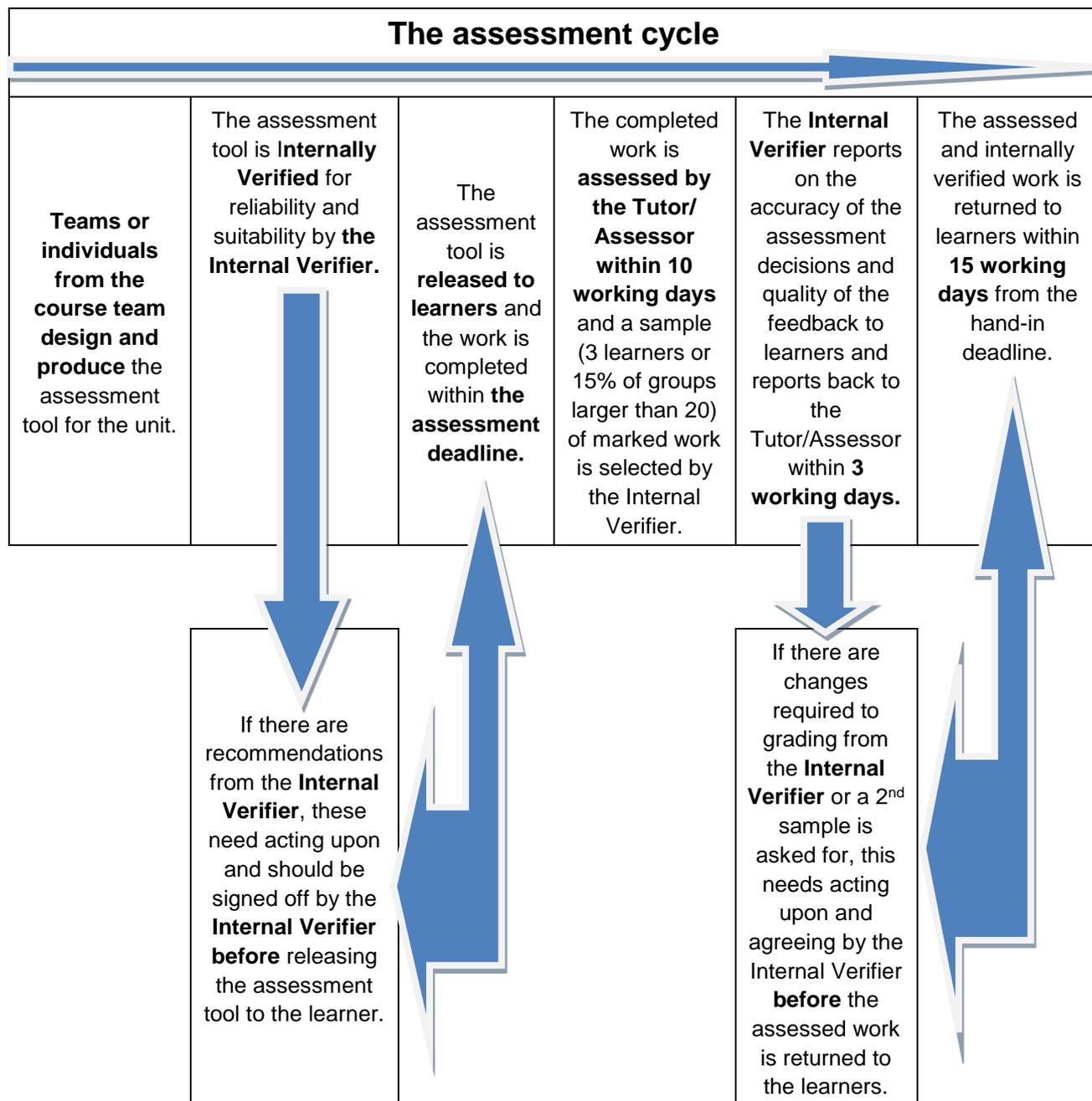
The assessment tool or activity for each unit is designed and set by each course team or an individual member of the team. A unit may have more than one assessment type to cover all of the learning outcomes but this will not *normally* exceed more than one per learning outcome. Where possible, a single assessment activity per unit is advised. Whilst **all** of the content of a unit must be taught, course teams can be **selective** about which aspects of the content may be assessed, particularly where assessment tests or assignments are unseen prior to the learner taking them.

Once the assessment tool is designed and written it is given to an **Internal Verifier** to verify prior to being released to learners. The **Internal Verifier** must be independent from the design and production process of the assessment tool. The role of the **Internal Verifier** is to check the reliability and appropriateness of the assessment tool. The Internal Verifier will complete a pro-forma and feedback to the assessment tool writer/designer who will act upon any recommendations or required changes before issuing the assessment tool to learners.

Each learner will complete the appropriate assessment task or tasks for each unit to a given deadline. On completion of each unit learners will declare that the work produced is their own unaided work (except in the case of examinations or tests taken under timed and supervised conditions). The tutor/assessor will countersign this declaration to confirm that the work carried out is the learner's own and unaided work. Learners may carry out research activities outside of the supervised sessions, but any work submitted for assessment must be authenticated and attributable to the learner. Learners should ensure that any work by others or research material used in their assessed work is properly referenced and the source acknowledged.

Learner work will be assessed by the tutor/assessor using the grading criteria from each unit. The **Internal Verifier** will sample the assessed work and feedback to

the tutor/assessor on the accuracy of their assessment decisions using an Internal Verification pro-forma. The Tutor/Assessor must act on the feedback from the Internal Verifier and amend their assessment decisions accordingly. A further sample may be asked for where there are inaccuracies in the marking. A minimum of **three** different learners' work or **15%** of the cohort (whichever is the greater) should be sampled by the Internal Verifier for each assessment task. Across all units, all learners should be sampled where possible.



Standardisation

To ensure that standards are maintained across the whole Jersey Progression Qualification and within each subject strand, a **Lead Internal Verifier** will sample at least **three** different internally verified Assessment Tools within each subject strand. The **Lead Internal Verifier** will provide each Course Team and their Internal Verifiers with a brief report that highlights areas of good practice and identifies any areas for improvement. The **Lead Internal Verifier** will also report to an annual **Jersey Progression Qualification Review Board** on the standard, quality and consistency of the assessment tools being used across the qualification and make recommendations for improvements year on year.

The **Lead Internal Verifier** will also sample at least **three** internally verified assessment decisions from each subject strand. They will compare standards across and between each subject strand. This will ensure that assessment and grading decisions are being arrived at consistently in terms of the types and quality of evidence being presented for assessment purposes and the application of grading descriptors. The **Lead Internal Verifier** will also carry out standardisation exercises within subject strands and between different subject strands. The **Lead Internal Verifier** will produce a brief report for each course team that highlights good practice and provides recommendations that will ensure consistency and fairness of marking. The **Lead Internal Verifier** will also report to an annual **Jersey Progression Qualification Review Board** on the reliability and consistency of assessment decisions within each programme and across the Jersey Progression Qualification as a whole.

External verification

To further assure the quality and consistency of assessment across all subjects of the Jersey Progression Qualification, there is an external verification process that mirrors that of the Lead Internal Verification process. External verification is carried out by an external verifier who is appointed, trained and monitored by NCFE. The external verifier is responsible for monitoring and sampling learners' evidence to ensure that assessment decisions are valid, reliable, fair and consistent. The issuing of certificates by NCFE is subject to the External Verifier reporting that all of the conditions of accreditation have been met.

Awarding

An annual **Award Board** is held in late June/early July once all of the assessments are completed across all subject areas and the grades for each student are verified and recorded. The College Registrar is responsible for running these meetings and ensuring that the correct grades are recorded and reported to NCFE. **The Award Board** is made up of the Chair (normally the College Registrar), a member of the College Leadership Team, the Lead Internal Verifier and a Minutes Secretary.

Attendance at the Award Board

- The Head of Department or Director for the named qualification
- The Subject Co-ordinator for the named qualification
- The internal verifier(s) of all units for the named qualification
- Attendance of **unit assessors** at the awarding meeting is **optional**

Required documentation for the Award Board

- Copies of all completed Extenuating Circumstances forms (if any)
- Copies of all completed Candidate Appeals forms (if any)
- Copies of documentation related to compensation for missing marks (if any)
- Completed grading sheets for all candidates showing all unit grades and the proposed final overall grade for the Jersey Progression Certificate and for the Jersey Progression Diploma.

Agenda for the awarding meeting²

1. Welcome by the Chair and record of attendees made
2. Consideration of any Extenuating Circumstances
3. Decisions regarding individual candidates and extenuating circumstances documented and implemented **prior** to awarding³
4. Consideration of any Appeals
5. Decisions regarding individual appeals documented and implemented **prior** to awarding
6. Review of any candidates who have failed to complete the Certificate or the Diploma (or Unit 4: Working in the Industry) where there are no extenuating circumstances and/or an appeal has not been upheld
7. Chair records decisions related to non-completers which will be **one** of the following:
 - a. The candidate is allowed to resubmit work by a set date
 - b. The candidate is unable to resubmit work and achievement at unit only level will be recorded
8. Review of grade boundaries (at unit level for unit 4; at whole qualification level for named qualifications awarding).⁴
 - a. For unit 4: The Unit Leader will talk the panel through the Minimum Mark Setting Process for the unit and verify how the grade boundary decisions for the unit were reached. Comparison with the previous year's grade boundaries also to be taken into consideration.
 - b. All candidates with grades **PPMM** (which equates to an overall **Pass** grade) to be reviewed. This is to ensure that the team is satisfied that all of the units graded Pass are securely assessed. If any of the units graded at Pass are close to the Pass/Merit boundary, this work may be recommended for re-assessment. If one of the pass units is re-assessed at Merit, the overall grade to be awarded at **Merit**.

² Unit 4: Working in the Industry is common to all named qualifications. There will be a separate awarding meeting for this unit which will happen before the subject panels. The agenda for this meeting will relate solely to the unit and the decisions for this unit will be carried forward to each subject awarding meeting.

³ Where decisions related to Extenuating Circumstances and/or appeals cannot be resolved at this stage, the panel will reconvene to determine the outcomes for the individual candidates concerned. Decisions related to candidates where there are no appeals or extenuating circumstances will be made as part of items 6 and 7.

⁴ Where the Unit 4 result is the reason for a candidate's overall grade being on the Pass/Merit or Merit/Distinction grade boundaries and that candidate's unit 4 grade is within 1 mark of the learning outcome grades for the unit, their work will be reviewed.

- c. All candidates with grades **MMMDD** (which equates to an overall **Merit** grade) to be reviewed. This is to ensure that the team is satisfied that all of the units graded Merit are securely assessed. If any of the units graded at Merit are close to the Merit/Distinction boundary, this work may be recommended for re- assessment. If one of the Merit units is re-assessed at Distinction, the overall grade to be awarded at **Distinction**.
9. Confirmation of the award of the Jersey Progression Certificate and the Jersey Progression Diploma for each candidate in the named qualification pathway.
10. Summary of Actions from the meeting.
11. AOB.

The Chair will make it clear at the outset of each Awarding Meeting that the results remain confidential until the External Verifier has submitted their final report for the year.

Assessment regulations

To achieve the **Jersey Progression Qualification** learners will successfully pass the units associated with the qualification. The assessment schedule for each unit will be identified at the start of the course and may include a range of different tasks such as practical activities, skill tests, in-class tests, course work, written reports and formal examinations, amongst others. A submissions calendar for all assessed work will be made available at the beginning of the academic year.

Deadlines for assessment are an important part of the **Jersey Progression Qualification** as by meeting these, learners develop the important employability skill of good time management. It is also important not to advantage learners by accepting late work. This allows individuals extra time to complete assignments, which is unfair. If there are extenuating circumstances for late submission the learning needs to complete the appropriate form and submit it for consideration at the Award Board. Assessments which are not submitted by the original specified assessment deadline but are received within five working days afterwards will be marked but will only be able to receive a maximum grade of **Pass**. Late work will have limited written feedback.

Normally only one opportunity will be given to provide final formative assessment feedback on assessed work. Feedback will focus on enhancing the learners' understanding and knowledge to allow them to further develop their answers. It is not intended that tutors write or provide information that can be directly incorporated into an assessment.

Following formative assessment and feedback, learners are able to:

- Revisit work to add to the original evidence produced to consolidate a Pass grade or to enhance their work to achieve a higher grade
- Submit evidence for summative assessment and the final unit grade.

Summative assessment is a final assessment decision on an assessment task in relation to the assessment criteria of each unit. It is the definitive assessment and it is recorded on the learner's profile. Should the learner not achieve at least a Pass grade, the submitted work will be recorded as 'Not Yet Achieved'.

Reassessment

The decision on whether to offer the learner the opportunity for reassessment will be made by the Course Team, in consultation with the Lead Internal Verifier, prior to the Award Board. Reassessment can either be through:

- Resubmission – revision of the work originally submitted; or
- Retake – submission of a new piece of work.

Extenuating circumstances

The purpose of this policy is to outline the support available for learners who, during their studies, experience exceptional unforeseen circumstances beyond their control which severely affect their ability to successfully complete an assessment, meet an assignment deadline or sit an examination. The table below gives an indication of what might be considered valid extenuating circumstances and circumstances which would not be considered valid.

This list is not exhaustive and learners should not make assumptions regarding extenuating circumstances but should ask for advice from their tutor or staff from Student Life to confirm what might be an appropriate claim.

Each claim for extenuating circumstances must be accompanied by a completed Extenuating Circumstances Form (see Appendix I) and independent supportive evidence which is signed and dated by the appropriate individual, e.g. the doctor. Examples of corroborating evidence likely to be acceptable include an original copy of a medical certificate, the doctor's or counsellor's letter on headed paper, or a hospital appointment letter. Every claim for extenuating circumstances will be considered by the Course Team, in consultation with the Lead Internal Verifier, on a case by case basis.

Applications for extenuating circumstances should always be made as soon as possible **before** the assessment deadline. Claims made after the assignment is due will not normally be considered unless there are exceptional reasons for not doing so. Evidence and a completed claim form must be provided within five working days of the assessment deadline to support any such claims. If a claim is considered valid, an extension of a maximum of **ten working days** will normally be granted and the assessment must be submitted before this revised deadline. Any late submission of work for which there is no valid claim for extenuating circumstances but which is submitted within five working days of the initial deadline will receive a maximum grade of Pass.

Compensation

To be awarded the Jersey Progression Certificate it is expected that the learner achieves two core units and three option units and for the Jersey Progression Diploma a further two core units and three option units. However, it may be possible to award **compensation** for one incomplete unit in the Certificate and one incomplete unit in the Diploma if there are valid extenuating circumstances. This equates to a maximum of 20% compensation for each qualification. The decision to award compensation rests with the Award Board. Where a unit is compensated, this will be shown on the learner transcript.

Valid extenuating circumstances

Medical illness or serious injury which has a severe impact on work and can be evidenced by a GP/Doctor

Extreme personal problems

Bereavement of a close family member or close friend

Not valid

Coughs, colds, sore throats or other minor illnesses

Illness affecting relatives or friends would not be considered a valid reason unless it is serious or you are the main carer

Making personal arrangements such as holiday arrangements, medical appointments, etc., which conflict with the examination and assessment timetable

Transport problems

Computer problems including submission of the wrong file, computer malfunction, etc.

Alarm clock not going off

Misreading the timetable and/or failing to attend at the right time and in the right place

Non-submission of work

Lateness or absence from assessment sessions

Moving house

Sanctions imposed for being in breach of college regulations.

Student academic appeal procedure

If a learner disagrees with an assessment decision the procedure outlined below will be followed. Please note an appeal can only be based on the achievement/non-achievement of the specific criteria related to that assessment.

Stage One: Informal

If a learner disagrees with the assessment decision of an assessor, the learner must discuss this with the assessor within a period of five working days following the assessment decision. If the matter is unresolved then the issues should be documented on a Candidate Appeal Form (see Appendix II) before moving to Stage Two.

Stage Two: Formal

The internal verifier should review the assessment decision within five working days and notify the learner in writing. The learner agrees or disagrees with the outcome, in writing, within a period of five working days and if the matter is unresolved Stage Three takes effect.

Stage Three: Appeal Hearing

The College Registrar or their nominee will hear the appeal within a period of ten working days. The panel at the Appeal Hearing will also include the Head of Department, the original assessor and the internal verifier. The learner can choose to be accompanied by a friend, parent or guardian. The panel will inform the learner of the outcome of the hearing, both orally and in writing, within five working days.

Academic malpractice policy

Academic malpractice can be defined as any attempt to gain unfair advantage in the assessment process of a qualification and therefore manipulate the grades which might be achieved. Malpractice may be intentional or unintentional, however, the college policy on malpractice does not consider whether there is intention to deceive or not.

Examples of malpractice include:

- allowing someone else to complete the assignment;
- copying another learner's work (with or without their permission);
- copying anything from the internet or from an article or book without acknowledging the author; or
- failure to reference sources correctly.

All assessed work must be solely the own work of the learner and learners must sign an assessment cover sheet before submission to confirm this.

The College supports learners in the avoidance of malpractice by helping them to develop appropriate academic skills through the initial part of their studies. This includes tuition on how to carry out and record research, writing skills and referencing.

The College takes academic malpractice very seriously and has produced a full policy which outlines what is deemed as malpractice, the process the college will use to investigate its occurrence and the sanctions which may be imposed if malpractice is proven. The policy and guidelines relating to academic malpractice can be found on the College Intranet.

Access arrangements and reasonable adjustments

The College takes its commitments under the Discrimination (Jersey) Law 2013 very seriously and works to create equal access for learners through the provision of information, advice, guidance and, where appropriate, additional support to meet individual needs and situations.

If you have a recognised learning need, medical condition or disability which affects your ability to study, complete assessments or sit examinations, you must bring this to the attention of your tutor. They will advise you on the best course of action in accordance with the Highlands College Special Educational Needs and Equality, Diversity and Inclusiveness policies. These College policies have been developed to take account of the published policies and regulations of the Joint Council for Qualifications. Under these policies you may qualify for access arrangements, reasonable adjustments or additional support when studying or undertaking assessed work. Any such claims must be made in a timely manner and supported by appropriate evidence and documentation.

Section B

Unit Content

and

assessment

guidance

Structure of the Jersey Progression Qualification in Automotive Studies

Unit No.	Unit Title	Core/Option
1	Routine Engine Maintenance and Servicing	Core
2	Health and Safety in the Automotive Environment	Core
3	Vehicle Maintenance and Servicing	Core
4	Working in the Industry	Core
<p>The Jersey Progression Certificate requires learners to achieve unit 1 or 3 and unit 2 or 4.</p> <p>The Jersey Progression Diploma requires learners to achieve the remaining two core units.</p>		
5	Four-stroke Engine Technology	Option
6	Use of Workshop Tools and Equipment	Option
7	Low Carbon Technologies	Option
8	Vehicle Electrical Principles	Option
9	Steering Systems and Tyre Technology for Light Vehicles	Option
10	Light Vehicle Braking Systems	Option
<p>The Jersey Progression Certificate requires learners to achieve unit 1 or 3 and unit 2 or 4 and a further three option units.</p> <p>The Jersey Progression Diploma requires learners to achieve the remaining two core units and a further three different option units from those achieved for the Certificate.</p>		

Unit 1 – Routine Engine Maintenance and Servicing

Unit summary

This unit will form a synoptic test using your knowledge from other units. It will introduce you to the principles of routine engine maintenance for four-stroke S.I. (Spark Ignition) engines. You will need to know the tools and equipment used during routine engine maintenance as well as the procedures to ensure this is carried out safely and effectively.

Guided learning hours

48 hours

Level

2

Learning outcome 1

The learner will: Understand the reasons for servicing four-stroke SI engines.

The learner must know about:

- Systems and components that require maintenance
- Reasons that these systems require maintenance
- Service checklists.

Learning outcome 2

The learner will: Conduct a routine engine service on a four-stroke SI engine.

The learner must demonstrate:

- Correct procedures when inspecting components during routine engine maintenance.
- Correct use of tools, equipment and measurement instruments.
- Engine servicing/maintenance
- Conducting an emissions test.

Learning outcome 3

The learner will: Review the method used to carry out the service and suggest ways in which this could be modified in the future.

The learner must consider:

- Areas for improvement and alternative methods that could be used.
- Recommendations for improvement.
- The justification of any changes in terms of cost or time.

Grading descriptors

Pass:	<p>LO1: Understand the reasons for servicing four-stroke SI engines</p> <ul style="list-style-type: none"> • Identify the systems and key components that require maintenance in four-stroke SI engines. • Identify reasons why these systems require maintenance. • Create a basic service checklist. <p>LO2: Conduct a routine engine service on a four-stroke SI engine.</p> <ul style="list-style-type: none"> • Use correct procedures competently when inspecting components during the routine engine service. • Use correct tools, equipment and measurement instruments competently. • Conduct an emissions test competently. <p>LO3: Review the method used to carry out the service and suggest ways in which this could be modified in the future.</p> <ul style="list-style-type: none"> • Identify an area for improvement. • Identify an alternative method that could be used. • Justify the alternative method in terms of cost or time.
Merit:	<p>LO1: Understand the reasons for servicing four-stroke SI engines</p> <ul style="list-style-type: none"> • Outline the systems and key components that require maintenance in four-stroke SI engines. • Outline reasons why these systems require maintenance. • Create a comprehensive service checklist. <p>LO2: Conduct a routine engine service on a four-stroke SI engine.</p> <ul style="list-style-type: none"> • Use correct procedures confidently when inspecting components during the routine engine service. • Use correct tools, equipment and measurement instruments confidently. • Conduct an emissions test confidently. <p>LO3: Review the method used to carry out the service and suggest ways in which this could be modified in the future.</p> <ul style="list-style-type: none"> • Outline some areas for improvement. • Outline some alternative method that could be used. • Justify the alternative methods in terms of cost or time.

LO1: Understand the reasons for servicing four-stroke SI engines

- Outline the systems and key components that require maintenance in four-stroke SI engines.
- Give detailed reasons why these systems require maintenance.
- Create a comprehensive service checklist with a logical order.

LO2: Conduct a routine engine service on a four-stroke SI engine.

- Use correct procedures skilfully when inspecting components during the routine engine service.
- Use correct tools, equipment and measurement instruments skilfully.
- Conduct an emissions test skilfully.

LO3: Review the method used to carry out the service and suggest ways in which this could be modified in the future.

- Describe several areas for improvement.
- Describe some alternative methods that could be used.
- Justify in detail the alternative methods in terms of cost or time.

Assessment

This unit is externally assessed. The external assessment for this outcome consists of:

- Completion of a service plan/checklist for a four-stroke spark ignition engine
- Completion of a routine engine service on a 4-Stroke SI engine as fitted to a running vehicle with faults
- Completion of an exhaust emissions test to a running vehicle after a service
- Completion of the service plan/checklist
- Completion of a review of the service.

Types of evidence

- A printed service plan/checklist.
- Witness testimony from the external verifier to confirm the routine engine service on a four-stroke SI engine has been carried out to a satisfactory standard.
- Short written or oral report covering a review of the service.

Delivery guidance

This unit covers the main components that require servicing, the reasons for servicing them and the potential problems if they are not serviced. Tutors will use focused practical tasks to prepare the learners for the assessment and a wide range of teaching methods to deliver the theory element of this unit e.g. formal lectures, videos, internet research, written materials, class discussions and presentations. Site visits to main dealership workshops and the Driver and Vehicles Standards Department would be an excellent way to see how maintenance and testing is conducted in a real world environment.

Systems and components that require maintenance could include the cooling system, the lubrication system, induction system, ignition system, crankcase ventilation system. **Reasons that these systems require maintenance** could include warranty, legal requirements performance and reliability. The potential for increasing cost of repair if maintenance is not carried out could include (to the cooling system) overheating and head gasket failure, (to the lubrication system) risk of bearing damage or seizure, (to the ignition system) misfires, poor fuel economy and increased emissions and (to the crankcase ventilation system) oil leaks or poor running. **The correct procedures** could include; a systematic visual inspection of the main components for signs of wear, an aural assessment during engine operation, comparison of measurements with specifications, recording possible problems, the correct procedures when replacing engine. **The correct use of tools, equipment and measurement instruments** could include, basic hand tools, equipment (2 and 4 post lifts, trolley jacks, exhaust gas analyser, feeler blades. **The engine servicing/maintenance** could include; (for the cooling system) checking specific gravity, topping up, pressure testing radiator and cap, an engine oil and filter change, an air filter change, a visual inspection of the positive crankcase ventilation system, removal and replacement and gapping spark plugs, inspection for leaks form the engine. **Conducting an emissions test** could include; warming engine, use of exhaust extraction, preparing equipment, RPM measurement and gas measurement.

Unit 2 – Health and Safety in the Automotive Environment

Unit summary	This unit will introduce you to health and safety requirements when carrying out non-complex fitting tasks in automotive environments. The unit covers the general requirements of health and safety in automotive environments, including personal responsibilities, common risks and hazards, and health and safety information.
---------------------	--

Guided learning hours	48 hours
------------------------------	-----------------

Level	2
--------------	----------

Learning outcome 1

The learner will: Understand health and safety requirements and information in automotive environments.

The learner must know about:

- Personal responsibilities for health and safety
- Common risks and hazards in automotive environments
- Health and safety information and notices provided in an automotive environment.

Learning outcome 2

The learner will: Use Personal Protective Equipment (PPE) and identify hazards in an automotive environment.

The learner must demonstrate:

- Use of the correct PPE in a given scenario
- The identification of hazards in an automotive environment
- A safe, efficient way to turn hazards into a safe condition

Learning outcome 3

The learner will: Review the risks associated with particular hazards.

The learner must consider:

- Health and Safety legislation
- Risk assessments

Grading descriptors

Pass:

LO1: Understand health and safety requirements and information in automotive environments.

- Identify common risks and hazards in an automotive environment.
- Identify personal responsibility for health and safety.
- Recognise health and safety information and notices provided in an automotive environment.

LO2: Use Personal Protective Equipment (PPE) and identify hazards in an automotive environment.

- Use some correct PPE in a given automotive environment scenario
- Identify some hazards in an automotive environment with some degree of accuracy.
- Identify safe ways to turn some hazards into a safe condition.

LO3: Review the risks associated with particular hazards

- Outline the risks associated with the scenario and consequent actions.
- Identify some strengths and weaknesses in the actions.
- Make some recommendations for improvement.

Merit:	<p>LO1: Understand health and safety requirements and information in automotive environments.</p> <ul style="list-style-type: none"> • Outline common risks and hazards in an automotive environment. • Outline personal responsibility for health and safety. • Outline health and safety information and notices provided in an automotive environment. <p>LO2: Use Personal Protective Equipment (PPE) and identify hazards in an automotive environment.</p> <ul style="list-style-type: none"> • Use the correct PPE in a given automotive environment scenario. • Identify all hazards in an automotive environment with some accuracy. • Identify safe and efficient ways to turn hazards into a safe condition. <p>LO3: Review the risks associated with particular hazards</p> <ul style="list-style-type: none"> • Describe the risks associated with the scenario and consequent actions. • Identify some strengths and weaknesses in the actions and give alternatives. • Make several recommendations for improvement.
Distinction:	<p>LO1: Understand health and safety requirements and information in automotive environments.</p> <ul style="list-style-type: none"> • Describe in detail common risks and hazards in an automotive environment. • Describe in detail personal responsibility for health and safety. • Describe in detail health and safety information and notices provided in an automotive environment. <p>LO2: Use Personal Protective Equipment (PPE) and identify hazards in an automotive environment.</p> <ul style="list-style-type: none"> • Use the correct PPE in a given automotive environment scenario. • Identify all hazards in an automotive environment with consistent accuracy. • Identify safe and efficient ways to turn all hazards into a safe condition. <p>LO3: Review the risks associated with particular hazards</p> <ul style="list-style-type: none"> • Give a comprehensive description of the risks associated with the scenario and consequent actions. • Identify some strengths and weaknesses in the actions and defend them against alternatives. • Make detailed recommendations for improvement.

Assessment

This unit is externally assessed. The external assessment for this unit consists of:

- Completion of an examination under controlled conditions where learners answer questions based on a case study describing common hazards within a motor vehicle workshop.
- Completion of a practical test where a bay within the motor vehicle workshop will be set up with five common hazards. Each learner will be assessed on: (a) their ability to identify these hazards and (b) their ability to assess the situation and make it safe without endangering themselves
- Completion of a five-minute viva voce (oral examination) where learners will respond to questions about their actions in the practical test put to them by the external verifier.

Types of evidence

- A written examination under controlled conditions. Learners will have 1 hour and 30 minutes in which to answer all the questions.
- A bay within the motor vehicle workshop will be set up with five common hazards. The session will be observed 1on1 by an external verifier. Each learner will be assessed on: (a) their ability to identify these hazards and (b) their ability to assess the situation and make it safe without endangering themselves
- Within one working week, each learner will have a five-minute viva voce responding to questions about their actions in the scenario put to them by the external verifier. Learners may take *aide memoire* notes into the examination with them. The viva will be recorded for the purpose of standardisation.

Delivery guidance

The purpose of this unit is to introduce the learner to the health and safety requirements of the automotive industry. The learner will see how health and safety is an integral part of working life in a modern garage. Tutors will be encouraged to use a wide range of teaching methods to deliver this unit. Some of the likely methods may include: formal lectures, videos, internet research, class discussions and presentations. Site visits would be an excellent method of demonstrating basic health and safety precautions in an active workshop environment

- **Personal responsibilities** for health and safety could include; following health and safety notices and instructions, using correct Personal Protective Equipment (PPE) and behaving responsibly and safely and being aware of others
- **Common risks and hazards** in automotive environments could include; electrical equipment and trailing leads, airlines and air powered tools, hazardous substances, waste materials, lifting heavy equipment and fire
- **Health and safety information** and notices provided in an automotive environment could include; fire and emergency exits, health and safety instructions, the use of health and safety equipment and different groups of safety signs

Unit 3 – Routine Vehicle Maintenance and Servicing

Unit summary

This unit will form a synoptic test using your knowledge from other units. It will introduce you to the principles of routine light vehicle servicing. You will need to know the tools and equipment that would be used during routine vehicle maintenance as well as the procedures that must be used to ensure this is carried out safely and effectively.

Guided learning hours

48

Level

2

Learning outcome 1

The learner will: Understand the reasons for servicing light vehicles.

The learner must know about:

- The systems and components that require maintenance
- The reasons these systems require maintenance.
- Service checklists.

Learning outcome 2

The learner will: Conduct a routine engine service on light vehicle.

The learner must demonstrate:

- Correct procedures when inspecting components during routine vehicle maintenance.
- Correct use of tools, equipment and measurement instruments.
- Vehicle servicing and maintenance techniques.

Learning outcome 3

The learner will: Review the method used to carry out the service and suggest ways in which this could be modified in the future.

The learner must consider:

- Areas for improvement and alternative methods that could be used.
- Recommendations for improvement.
- The justification of any changes in terms of cost or time.

Grading descriptors

Pass:

LO1: Understand the reasons for servicing light vehicles.

- Identify the systems and components that require maintenance in light vehicles.
- Identify reasons why these systems require maintenance.
- Create a basic service checklist.

LO2: Conduct a routine engine service on a light vehicle.

- Use correct procedures competently when inspecting components during the routine engine service.
- Use correct tools, equipment and measurement instruments competently.
- Conduct an emissions test competently.

LO3: Review the method used to carry out the service and suggest ways in which this could be modified in the future.

- Identify an area for improvement.
- Identify an alternative method that could be used.
- Justify the alternative method in terms of cost or time.

Merit:	<p>LO1: Understand the reasons for servicing light vehicles.</p> <ul style="list-style-type: none"> • Outline the systems and components that require maintenance in light vehicles. • Outline reasons why these systems require maintenance. • Create a comprehensive service checklist. <p>LO2: Conduct a routine engine service on a light vehicle.</p> <ul style="list-style-type: none"> • Use correct procedures confidently when inspecting components during the routine engine service. • Use correct tools, equipment and measurement instruments confidently. • Conduct an emissions test confidently. <p>LO3: Review the method used to carry out the service and suggest ways in which this could be modified in the future.</p> <ul style="list-style-type: none"> • Outline some areas for improvement. • Outline some alternative methods that could be used. • Justify the alternative method in terms of cost or time.
Distinction:	<p>LO1: Understand the reasons for servicing light vehicles.</p> <ul style="list-style-type: none"> • Outline the systems and components that require maintenance in light vehicles. • Give detailed reasons why these systems require maintenance. • Create a comprehensive service checklist with a logical order. <p>LO2: Conduct a routine engine service on a light vehicle.</p> <ul style="list-style-type: none"> • Use correct procedures skilfully when inspecting components during the routine engine service. • Use correct tools, equipment and measurement instruments skilfully. • Conduct an emissions test skilfully. <p>LO3: Review the method used to carry out the service and suggest ways in which this could be modified in the future.</p> <ul style="list-style-type: none"> • Describe several areas for improvement. • Describe some alternative methods that could be used. • Justify the alternative method in terms of cost or time.

Assessment

This unit is externally assessed. The external assessment for this unit consists of:

- Completion of a service plan/checklist for light vehicle systems (electrical, steering, brakes and tyres)
- Completion of a routine service to a light vehicle with faults
- Completion of the service plan/checklist
- Completion of a review of the service

Types of evidence

- A printed service plan/checklist
- Witness testimony from the external verifier to confirm the work has been carried out to a satisfactory standard.
- Short written or oral report covering review of the service.

Delivery guidance

This unit covers the main components that require servicing, the reasons for servicing them and the potential problems if they are not serviced to the recommended schedule. Tutors will use focused practical tasks to prepare the learners for the assessment in LO2 and a wide range of teaching methods to deliver the theory element e.g. formal lectures, videos, internet research, class discussions and presentations. Site visits to main dealership workshops and the Driver and Vehicles Standards Department would be a way to see how maintenance and testing is conducted in a real world environment.

Systems and components that require maintenance could include; the electrical system, the steering system, braking system and tyres. **Reasons these systems require maintenance** could include; warranty, legal requirements (Motor Vehicles (Construction and Use) (Jersey) Order 1998 Subsection K68), safety, performance and reliability. **Potential for decreasing safety and reliability if maintenance is not carried out** could include; non-starting due to flat battery, poor visibility, poor vehicle control, wear on tyres, poor vehicle control, leaks affecting other parts and poor vehicle control, increased stress on suspension components. **Correct procedures when inspecting components during routine vehicle maintenance** could include; a systematic visual inspection of the main components for signs of wear, comparison of measurements with specifications, recording possible problems, the correct procedures when checking the headlamp and front wheel alignment. **Correct use of tools, equipment and measurement instruments** could include; basic hand tools and equipment. **Vehicle servicing/maintenance** could include; the electrical system, steering system, braking system and tyres.

Unit 4 – Working in the Industry

Unit summary	This unit will develop your readiness for the world of work. Through research activities you will develop an awareness of your industry sector and the opportunities that may be open to you. You will assess your current employability skills, plan for a placement and subsequently embark on work experience. This unit concludes with an opportunity to re-assess your skill set and the progress made.
---------------------	--

Guided hours	48 hours
---------------------	-----------------

Level	2
--------------	----------

Learning outcome 1

The learner will: Identify current employability skills and plan for an industry relevant work placement.

The learner must know about:

- Employability skills and employment opportunities in their industry.
- Curriculum vitae (CV) and covering letters.
- Interview skills.

Learning outcome 2

The learner will: Carry out an industry relevant work placement.

The learner must demonstrate:

- Planning skills
- Communication skills
- Self-management skills
- Team work skills
- Problem solving skills
- Decision making skills

Learning outcome 3

The learner will: Review the progress made in developing employability skills during the placement period and how this has influenced their plans for the future.

The learner must consider:

- Their current employability skills
- The progress made from their work experience
- The impact of their work experience on improving their employability skills
- How their work experience placement has influenced their plans for the future

Grading descriptors

Pass:

LO1: Identify current employability skills and plan for an industry relevant work placement.

- Identify current employability skills, their strengths and areas for development.
- Identify three employment options in the sector
- Complete preparation for an appropriate work placement including a basic C.V., covering letter and demonstration of adequate interview skills.

LO2: Carry out an industry relevant work placement.

- Complete an appropriate work placement with a satisfactory outcome.
- Complete a daily work placement portfolio demonstrating some degree of accuracy against the brief.

LO3: Review the progress made in developing employability skills during the placement period.

- Identify a range of strengths and areas for development in employability skills and provide evidence to support this.
- Outline basic ways to improve the employability skills.
- Outline how their placement has influenced their plans for the future

Merit:

LO1: Identify current employability skills and plan for an industry relevant work placement.

- Identify current employability skills, strengths and areas for improvement with explanations of these.
- Identify and describe the job roles of at least 3 employment options in the sector
- Complete tailored preparation for an appropriate work placement including a tailored C.V., appropriate covering letter and demonstration of good interview skills.

LO2: Carry out an industry relevant work placement.

- Complete an appropriate work placement with a satisfactory outcome.
- Complete a daily work placement portfolio demonstrating mostly accurate information against the brief.

LO3: Review the progress made in developing employability skills during the placement period.

- Identify a range of strengths and areas for development in employability skills and provide evidence to support this.
- Outline advanced ways to improve the employability skills.
- Describe how their placement has influenced their plans for the future

Grading descriptors

Distinction:

LO1: Identify current employability skills and the appropriate employability options in the industry.

- Identify current employability skills, outline strengths and areas for improvement with detailed explanations of each.
- Identify and evaluate several employment options in the sector.
- Complete thorough and appropriate preparation for a work placement including a detailed C.V., covering letter and demonstration of excellent interview skills.

LO2: Carry out an industry relevant work placement.

- Complete an appropriate work placement with a satisfactory outcome.
- Complete a daily work placement portfolio with accurate information against the brief.

LO3: Review the progress made in developing employability skills during the placement period.

- Identify a range of strengths and areas for development in employability skills, recognise their relative importance and provide evidence to support this.
- Describe advanced ways and develop ideas to improve the employability skills.
- Give detailed account of how their placement has influenced their plans for the future

Assessment

The assessment for this unit requires the completion of:

1. an online employability skills assessment via “Navigate” under controlled conditions. This will be completed during the first week of course.
2. pre-placement planning and preparation including a C.V., covering letter.
3. allocated days of work placement at a time appropriate for industry, the course and the learner.
4. a daily work placement journal.
5. a second online employability skills assessment (following placement) via “Navigate” under controlled conditions demonstrating the progress made since the first employability skills assessment.
6. A review task in the form of an interview under controlled conditions.

Timing of assessment tasks:

- Employability skills assessment
- Completion of pre-placement paperwork
- Completion of work placement (minimum 5 days)
- Maintenance of work placement journal
- Reassessment of employability skills post placement under controlled conditions
- Controlled assessment in the form of interview to reflect on unit, work experience and plans for the future.

Types of evidence

The evidence for this unit consists of:

1. The results of an online employability skills assessment.
2. Pre-placement planning and preparation including a C.V., covering letter, and evidence of interview skills.
3. Completion of allocated days of work placement.
4. A daily work placement journal.
5. The results of a second online employability skills assessment (following placement).
6. An observed interview carried out by an external examiner.

Delivery guidance

The focus of this unit is the professional approach required by learners when applying for any form of employment, work experience or voluntary position. Learners will be given the opportunity to complete sufficient time in a placement to ensure that they have been able to develop their employability skills and knowledge of the industry/work place. This unit will be delivered by a combination of e-learning through the online platform Navigate, tutor input, visiting speakers from the industry and work placement supervisors.

Learners will need to know about their current employability skills. They will complete an online skills questionnaire and set targets on Navigate. These will be discussed with their tutor. Learners will research into employment opportunities, both on and off the island, through tutor taught sessions, visiting speakers from the industry and research on line. Research should include knowledge of specific recruitment methods for industry and the part social media plays in job searching. Learners will identify appropriate opportunities linked to personal analysis through a career planning computer package e.g. Adult Directions accessed through Navigate and e-learning sessions.

Learners will prepare for their placement through taught sessions and Navigate. They will identify appropriate placement organisations, matching job description and person specification to skills, abilities and qualities. They will learn how to develop a relevant CV, complete an application form and produce an effective covering letter. They will demonstrate effective interview techniques and develop a knowledge of expectations and appropriate behaviours for placement.

Learners will complete a relevant and appropriate work placement and produce a daily placement journal through Navigate which will be verified by the placement supervisor and personal tutor. After the placement, learners will complete: an online placement review; a review of skills; and an updated C.V. They will identify their strengths and areas for development appropriate to employment in the industry.

Unit 5 – Four-stroke Engine Technology

Unit summary	This unit will introduce you to the principles of Spark Ignition (SI) engines, components and operation and includes the requirements for carrying out routine engine maintenance
---------------------	---

Guided learning hours	48 hours
------------------------------	-----------------

Level	2
--------------	----------

Learning outcome 1

The learner will: Identify the main components of SI engines and describe the operating cycle of the four-stroke engine.

The learner must know about:

- The main components used in SI engines.
- The operating cycle of the Otto cycle as used in SI engines.

Learning outcome 2

The learner will: Demonstrate the removal and refitting of SI engine components.

The learner must demonstrate:

- The selection of correct technical data for SI engine maintenance
- The correct procedures when removing and refitting SI engine components from a non-running stand engine.

Personal Protective Equipment (PPE).

Learning outcome 3

The learner will: Review the advantages of different common four-stroke SI engine layouts.

The learner must consider:

- Common four-stroke engine layouts.
- Advantages of common engine layouts.

Grading descriptors

Pass:

LO1: Identify the main components of SI engines and describe the operating cycle of the four-stroke engine.

- Identify some of the components used in SI engines.
- Identify the characteristics of operating cycle used in SI engines.

LO2: Demonstrate the removal and refitting of SI engine components.

- Safely remove and refit a cylinder head from a stand engine competently.
- Use the correct replacement, torque settings and valve timing procedures competently.

LO3: Review the advantages of different common four-stroke SI engine layouts.

- Outline some common four-stroke engine layouts.
- Identify some advantages of each common engine layout.

Merit:

LO1: Identify the main components of SI engines and describe the operating cycle of the four-stroke engine.

- Outline some of components used in SI engines.
- Describe the characteristics of the operating cycle used in SI engines.

LO2: Demonstrate the removal and refitting of SI engine components.

- Safely remove and refit a cylinder head from a stand engine confidently.
- Use the correct replacement, torque settings and valve timing procedures confidently.

LO3: Review the advantages of different common four-stroke SI engine layouts.

- Describe some common four-stroke engine layouts.
- Describe some advantages of each common engine layout.

LO1: Identify the main components of SI engines and describe the operating cycle of the four-stroke engine.

- Outline most of the components used in SI engines.
- Describe in detail the characteristics of the operating cycle used in SI engines.

LO2: Demonstrate the removal and refitting of SI engine components.

- Safely remove and refit a cylinder head from a stand engine skilfully.
- Use the correct replacement, torque settings and valve timing procedures skilfully.

LO3: Review the advantages of different common four-stroke SI engine layouts.

- Describe in detail some common four-stroke engine layouts.
- Describe in detail some advantages of each common engine layout.

Assessment

The assessment for this unit consists of:

- Completion of a question paper taken under controlled conditions.
- The demonstration of the removal and refitting a cylinder head to a 'stand' engine.
- Completion of a short report (500 word report or a five minute video presentation) including a diagram of each engine layout and a list of advantages of each type.

Types of evidence

- A question paper taken under controlled conditions.
- Tutor observation notes and sample video evidence of each learner removing and refitting a cylinder head to a 'stand' engine.
- A 500 word report or five minute video presentation with diagrams.

Delivery guidance

This unit introduces learners to four-stroke engines, the main components and the cycle of operation. It also covers the different layouts of engine and the advantages of these layouts. Tutors will be encouraged to use a wide range of teaching methods to deliver this unit e.g. formal lectures, videos, internet research, class discussions and presentations alongside practical investigations. Site visits to dealerships would also be an acceptable method of allowing learners to see the impact of different engine layouts on vehicle construction.

Main components used in SI engines could include; the cylinder block and head, the sump, the crankshaft, connecting rods and pistons, the camshaft and valves and the flywheel.

The operating cycle of the Otto cycle as used in SI engines could include; the piston position and movement through this cycle, the piston position when the valves are opening and closing, the piston position for timing of spark, the firing order(s) for a four-cylinder engine as well as engine terminology including bore, stroke, capacity, TDC, BDC and compression ratio

Selecting correct technical data for SI engine maintenance could include; vehicle manufacturer's repair instructions, vehicle manufacturer's engine specifications and torque settings

Demonstrate the correct procedures when removing and refitting SI engine components from a non-running stand engine could include; the use of PPE, the safe storage and protection of components whilst removed, a logical working sequence, the correct selection and use of tools and equipment, the correct setting and adjustment of the engine components and an awareness of others

SI engine components could include; the cylinder head, the camshaft(s), manifolds (inlet and exhaust

Common four-stroke engine layouts could include; in-line engines (3, 4 and 6 cylinder), v engines (V6, V8, V10 V12) and horizontally opposed 'boxer' engines (4 and 6 cylinder)

Advantages of common engine layouts could include; the centre of gravity, the length, cost, width and balance.

Unit 6– Use of Workshop Tools and Equipment

Unit summary	This unit will introduce you to the tools and equipment that are used in an automotive environment and show you how to work safely when using these items. The unit covers common hand tools and equipment used during routine vehicle maintenance.
---------------------	---

Guided learning hours	48 hours
------------------------------	-----------------

Level	2
--------------	----------

Learning outcome 1

The learner will: Identify hand tools and equipment used for vehicle maintenance.

The learner must know about:

- Hand tools used for vehicle maintenance
- Equipment used for vehicle maintenance

Learning outcome 2

The learner will: Use and maintain hand tools and equipment used for vehicle maintenance

The learner must demonstrate:

- Safe methods of work with hand tools and equipment
- Correct use of hand tools and equipment
- Basic maintenance of hand tools and equipment

Learning outcome 3

The learner will: Review defects in hand tools and equipment used for vehicle maintenance.

The learner must consider:

- What constitutes a defect.
- Whether maintenance or replacement is appropriate.

Grading descriptors

Pass:

LO1: Identify hand tools and equipment used for vehicle maintenance.

- Identify some of the hand-tools used for vehicle maintenance.
- Identify some of the items of equipment used for vehicle maintenance.

LO2: Use and maintain hand tools and equipment used for vehicle maintenance

- Use and maintain hand-tools correctly, most of the time, in different motor vehicle activities.
- Use and maintain equipment correctly, most of the time, in different motor vehicle activities.

LO3: Review defects in hand tools and equipment used for vehicle maintenance.

- Identify the most obvious defects in hand tools and equipment used for vehicle maintenance.
- Identify how this could affect the use of the hand tool or equipment.
- Identify how the defects could be rectified.

Merit:

LO1: Identify hand tools and equipment used for vehicle maintenance

- Outline some of the hand-tools used for vehicle maintenance.
- Outline some of the items of equipment used for vehicle maintenance.

LO2: Use and maintain hand tools and equipment used for vehicle maintenance

- Use and maintain hand-tools correctly in different motor vehicle activities.
- Use and maintain equipment correctly in different motor vehicle activities.

LO3: Review defects in hand tools and equipment used for vehicle maintenance.

- Describe in some detail different defects in hand tools and equipment used for vehicle maintenance.
- Describe in some detail how this could affect the use of the hand tool or equipment.
- Describe how and when the defects could be rectified.

LO1: Identify hand tools and equipment used for vehicle maintenance

- Outline most of the hand-tools used for vehicle maintenance.
- Outline most of the items of equipment used for vehicle maintenance.

LO2: Use and maintain hand tools and equipment used for vehicle maintenance

- Use and maintain hand-tools confidently and correctly in different motor vehicle activities.
- Use and maintain equipment confidently and correctly in different motor vehicle activities.

LO3: Review defects in hand tools and equipment used for vehicle maintenance.

- Describe in detail different defects in hand tools and equipment used for vehicle maintenance.
- Describe in detail how this could affect the use of the hand tool or equipment.
- Describe and justify how and when the defects could be rectified.

Assessment

The assessment for this unit consists of:

- Completion of a written test identifying hand tools and equipment carried out under controlled conditions.
- Demonstration of the use of tools and equipment across a minimum of three different motor vehicle activities.
- Completion of a written report (400-500 words) (or five-minute equivalent presentation to camera) to include photographic evidence of the defect, a description of the defect and how this could affect the use of the tool and a review of how this should be rectified (repair/replace).

Types of evidence

- A written test identifying hand tools and equipment.
- Observation of the use of tools and equipment. Observation sheet signed by the assessor
- Short written report (400-500 words) or five minute video report, reviewing defects in hand tools and equipment used for vehicle maintenance.

Delivery guidance

This unit introduces learners to the tools and equipment they may need to use in an automotive environment. It also covers the maintenance requirements and common faults found with these tools. Tutors will be encouraged to use a wide range of teaching methods to deliver this unit. e.g. formal lectures, videos, internet research, class discussions and presentations alongside practical investigations. Site visits to dealerships would also be an acceptable method of allowing learners to see how tools and equipment are used and cared for in an industrial context

Hand tools used for vehicle maintenance could include; metric spanners (open end, ring, combination and ratcheting), screwdrivers, chisels, steel rule and tape measure, metric Allen keys, metric socket sets, pliers and grips, torque wrenches, feeler blades and tyre tread depth gauges.

Equipment used for vehicle maintenance could include; hydraulic jacks, 2 and 4 post lifts, axle stands, air lines, tyre inflator/gauge, hand drills, extension leads, parts cleaners, oil filter removal wrenches, waste oil drainers and exhaust extraction.

Safe methods of working with hand tools and equipment could include; preparing tools for use, using tools safely and correctly, carrying out cleaning and basic maintenance of tools

Correct use of hand tools and equipment could include; holding tools correctly, selecting correct tool for task, stance when using tool, adjusting tools correctly (, preparing tools correctly and using appropriate Personal Protective Equipment (PPE) when necessary.

Basic maintenance of hand tools and equipment could include; cleaning tools, removing mushroom end from chisels, resetting torque wrench after use, inspecting tools for damage and returning tools to the correct place after use

What constitutes a defect could include; bent or distorted tools, cracks, rough edges, mushroomed chisels loose hammer heads, damaged screwdrivers, slipping ratchets, damaged sockets.

Unit 7– Low Carbon Technologies

Unit summary

This unit investigates how vehicles impact on the environment and the measures vehicle manufacturers are taking to reduce carbon outputs. The unit will also introduce you to the importance of precise engine fuelling and ignition as an aid to emission reduction.

Guided learning hours

48 hours

Level

2

Learning outcome 1

The learner will: Identify the technology used to lower carbon emissions on light vehicles and recognise which emission(s) are affected.

The learner must know about:

- Vehicle emissions and their effect.
- Emission reduction systems and their effect.
- The potential of bio-fuels to reduce greenhouse gases
- Engine emissions testing equipment.

Learning outcome 2

The learner will: Adjust the injection period of a given engine and record the output when running a) rich 7 b) lean.

The learner must demonstrate:

- Safe working practices when using workshop equipment to measure engine output and test vehicle emissions.
- How to reprogramme an engine control unit with two new fuel 'maps' (rich and lean).
- How to create a spread sheet converting torque into power based on a given formula.

Learning outcome 3

The learner will: Review the advantages and disadvantages of different air/fuel ratios.

The learner must consider:

- The balance between high power output and low emissions.
- The advantages of different engine testing methods.
- The effect of engine calibration on engine output (power and emissions)
- How driving technique will affect emissions.

Grading descriptors

Pass:

LO1: Identify the technology used to lower carbon emissions on light vehicles and recognise which emission(s) are affected.

- Identify the fuel used on a given vehicle.
- Identify some of the emission systems on a given vehicle and their effect.
- Identify an alternative system that is not fitted to the given vehicle.

LO2: Adjust the injection period of a given engine and record the output when running a) rich 7 b) lean.

- Measure engine output and test vehicle emissions using safe working practices.
- Reprogramme an engine control unit with two new fuel 'maps' (rich and lean).
- Create a spread sheet to convert torque into power based on a given formula.

LO3: Review the advantages and disadvantages of different air/fuel ratios (AFR).

- Review the spreadsheet data
- Reflecting on which AFR offered the best compromise.
- Identify the best driving manner for fuel consumption.

LO1: Identify the technology used to lower carbon emissions on light vehicles and recognise which emission(s) are affected.

- Outline the fuel used on a given vehicle.
- Identify all the emission systems on a given vehicle and their effect.
- Describe an alternative system that is not fitted to the given vehicle.

LO2: Adjust the injection period of a given engine and record the output when running a) rich 7 b) lean.

- Accurately measure engine output and test vehicle emissions using safe working practices.
- Reprogramme an engine control unit with two new fuel 'maps' (rich and lean).
- Create an accurate spread sheet to convert torque into power based on a given formula.

LO3: Review the advantages and disadvantages of different air/fuel ratios (AFR).

- Review the spreadsheet data analysing the effects of incorrect engine calibration
- Reflect on which AFR offered the best compromise.
- Identify the best and worst driving manner for fuel consumption.

LO1: Identify the technology used to lower carbon emissions on light vehicles and recognise which emission(s) are affected.

- Describe the fuel used on a given vehicle.
- Describe all the emission systems on a given vehicle and their effect.
- Describe in detail an alternative system that is not fitted to the given vehicle.

LO2: Adjust the injection period of a given engine and record the output when running a) rich 7 b) lean.

- Accurately and confidently measure engine output and test vehicle emissions using safe working practices.
- Confidently reprogramme an engine control unit with two new fuel 'maps' (rich and lean).
- Create an accurate spread sheet to convert torque into power based on a given formula.

LO3: Review the advantages and disadvantages of different air/fuel ratios (AFR).

- Review the spreadsheet data analysing the effects of incorrect engine calibration with supporting evidence.
- Reflect on which AFR offered the best compromise.
- Identify the best and worst driving manner for fuel consumption with supporting evidence.

Assessment

The assessment for this outcome consists of: Written identification of both observed and absent emission systems, as well as their effect on vehicle emissions, on a given vehicle.

- Direct observation of two narrow rpm band (2,000 – 4,000rpm) engine dynamometer tests with ECU programming ('mapping') taking place in small groups. Completion of a spreadsheet showing both torque and power, results from an MOT emissions test and a diesel smoke test.
- Completion of a short written report reviewing the data obtained.

Types of evidence

- Photograph of labels and emission descriptors attached to the different emission systems and recorded statement on alternative emissions systems
- Spreadsheet showing both torque and power, results from an MOT emissions test and a diesel smoke test.
- Short written report of about 400 words.

Delivery guidance

This unit introduces learners to the methods of emission reduction used on light vehicles today. It will give them the opportunity to map the fuel and ignition requirements of an engine as well as looking at the effects of lean and rich mixtures on engine output. Tutors will be encouraged to use a wide range of teaching methods e.g. formal lectures, videos, internet research, class discussions and presentations alongside practical investigations. Site visits to dealerships would allow learners to see how modern hybrid technology is incorporated into light vehicles. Carbon Footprint could include; the amount of greenhouse gases produced (most commonly carbon dioxide), how much is produced over the life of a vehicle (including manufacture, running and disposal of the vehicle at the end of its life). The fossil fuels used in an automotive context could include; carbon, hydrogen, hydrocarbons, crude oil, petrol and diesel. Vehicle emissions and the effect of them could include; carbon monoxide, carbon dioxide, oxides of nitrogen, soot particles, and hydrocarbons. Emission reduction systems and the effect of them could include; exhaust gas recirculation, evaporative emission systems (reduces hydrocarbon emissions), positive crankcase ventilation (PCV), catalytic converters (reduces HC, CO, NOx), secondary air systems (faster catalyst 'light off'), direct injection, low rolling resistance tyres, and hybrid and electric drivelines. How bio-fuels have the potential to reduce greenhouse gases could include; the carbon in the plant matter that produces the fuel, comes from the carbon dioxide absorbed by the plants over its life (unlike fossil fuels where the carbon has been locked up under ground for millions of years and then released to the atmosphere as carbon dioxide when burnt during combustion). Engine emissions testing equipment could include; 4 gas exhaust gas analysers, smoke meters, rolling roads, and engine dynamometers. How driving technique will affect emissions could include; excessive acceleration and deceleration, driving at high speed, idling engine whilst stopped, incorrect gear selection, use of auxiliary equipment such as air conditioning.

Unit 8– Vehicle Electrical Principles

Unit summary

This unit will introduce you to vehicle electrical systems, components and operation. It covers the identification of the main components used in vehicle systems, the main electrical principles and terminology. You will look at fundamental operating principles of vehicle electrical systems, be able to interpret simple electrical diagrams and create lighting circuits.

Guided learning hours

48 hours

Level

2

Learning outcome 1

The learner will: Understand basic vehicle electrical systems and electrical principles.

The learner must know about:

- Main electrical systems and components on a vehicle.
- Vehicle electrical principles and laws.
- Types of circuit, both series and parallel
- The ratings and types of bulbs
- Common electrical symbols and units of measurement.

Learning outcome 2

The learner will: Produce and test simple series and parallel circuits

The learner must demonstrate:

- Interpretation of simple wiring diagrams.
- Correct selection of fuses and wire for circuits.
- Correct procedures when making simple lighting circuits
- The correct use of a voltmeter.

Learning outcome 3

The learner will: Review the outcomes of their electrical circuit work.

The learner must consider:

- The advantages of different connection techniques.
- Review test results and suggest reasons for differences between theoretical and actual readings.

Grading descriptors

Pass:

LO1: Understand basic vehicle electrical systems and electrical principles.

- Identify some symbols in a given basic vehicle electrical system.
- Identify some components in a given basic vehicle electrical system
- Identify bulb type and power.
- Calculate the wire and fuse required in a simple lighting circuit and outline an electrical effect taking place within the circuit.

LO2: Produce and test simple series and parallel circuits.

- Create two circuits from given diagrams competently using correct procedures.
- Test the circuits using correct procedures competently.

LO3: Review the outcomes of their electrical circuit work.

- Identify some advantages of the connection method used.
- Suggest reasons for some of the differences between theoretical and actual readings.

Merit:	<p>LO1: Understand basic vehicle electrical systems and electrical principles.</p> <ul style="list-style-type: none"> • Identify several symbols in a given basic vehicle electrical system. • Identify several components in a given basic vehicle electrical system • Outline bulb type and power. • Calculate the wire and fuse required in a simple lighting circuit and outline electrical effects taking place within the circuit. <p>LO2: Produce and test simple series and parallel circuits.</p> <ul style="list-style-type: none"> • Create two circuits from given diagrams confidently using correct procedures. • Test the circuits using correct procedures confidently. <p>LO3: Review the outcomes of their electrical circuit work.</p> <ul style="list-style-type: none"> • Describe a range of advantages of the connection method used. • Outline reasons for most of the differences between theoretical and actual readings.
Distinction:	<p>LO1: Understand basic vehicle electrical systems and electrical principles.</p> <ul style="list-style-type: none"> • Identify most of the symbols in a given basic vehicle electrical system. • Identify most of the components in a given basic vehicle electrical system • Outline bulb type and power correctly. • Calculate the wire and fuse required in a simple lighting circuit and outline electrical effects taking place within the circuit with examples. <p>LO2: Produce and test simple series and parallel circuits.</p> <ul style="list-style-type: none"> • Create two circuits from given diagrams skilfully using correct procedures. • Test the circuits using correct procedures skilfully. <p>LO3: Review the outcomes of their electrical circuit work.</p> <ul style="list-style-type: none"> • Describe in detail a range of advantages of the connection method used. • Explain reasons for most of the differences between theoretical and actual readings.

Assessment

The assessment for this outcome consists of:

LO1: The identification of components in a basic vehicle electrical system, both symbols and actual, the bulb type and power. Calculation of the wire and fuse required as well as a description of the electrical effect taking place within the circuit.

LO2: The creation of two small circuits from given components and diagrams.

LO3: Completion of a review of the circuit task. Response to questions from the assessor in a five minute viva voce within a week of the practical task.

Types of evidence

LO1: The identification of components in a basic vehicle electrical system. Calculation of the wire and fuse required as well as a description of the electrical effect taking place within the circuit.

LO2: Observation of the practical circuit task. Signed 'witness testimony' from observing tutor to state that the learner has met the required standard

LO3: Recording of the viva voce. The oral evidence will also be captured on digital recording device. Learners may take aide memoire notes into the examination.

Delivery guidance

This unit introduces learners to vehicle electrical systems, components and their operation. It covers the main systems used in vehicle electrics and the main electrical principles. Tutors will be encouraged to use a wide range of teaching methods to deliver this unit e.g. formal lectures, videos, internet research, written matter, class discussions and presentations alongside practical investigations where the students can develop their hand skills in preparation for the assessment in LO2. Main electrical systems and components on a vehicle could include; the charging system, the starting system, the lighting system, and the auxiliary systems Vehicle electrical principles and laws could include; the magnet effect of electrical current and its application in motors and generators, the heating effect of electrical current and how this is used in lamps and heated screens, the chemical effect as it applies to the storage and discharge of electrical energy by the battery. Types of circuit could include; both series and parallel. Types of bulbs could include; tungsten, halogen and LED. Common electrical symbols could include; the battery, switches, motors, fuses, lamps, the earth connection, diodes, transistors, relays (single pole). Demonstration of the correct procedures to make simple lighting circuits could include; using cable, switches, fuses and bulbs including; the methods to connect the wires, minimising risk of short circuits, avoiding damage to components and the correct selection and use of tools and equipment. The advantages of different connection techniques could include ease of assembly/disassembly, longevity and vibration resistance.

Unit 9– Steering Systems and Tyre Technology for Light Vehicles

Unit summary

This unit will introduce you to the principles of vehicle steering systems and tyre technology. It covers the identification of the main components used in non-assisted steering systems, and the purpose and function of these components. It also looks at current light vehicle tyre technology including fitting and balancing.

Guided learning hours **48 hours**

Level **2**

Learning outcome 1

The learner will: Know about non-assisted steering components and light vehicle tyre technology.

The learner must know about:

- The types of tyre used on common light vehicles and the technical terms associated with them.
- The types of wheel used on light vehicles
- The main components in non-assisted steering systems and their purpose.

Learning outcome 2

The learner will: Undertake routine maintenance on steering systems and light vehicle tyres.

The learner must demonstrate:

- The correct procedures to remove and refit a standard tubeless tyre to a road wheel.
- The correct procedures to balance a standard wheel and tyre
- The correct procedures when removing and refitting a track rod end
- The correct method for adjusting front wheel alignment to within the manufacturer's tolerance.

Learning outcome 3

The learner will: Review a steering system and tyres in terms of meeting legal requirements

The learner must consider:

- The legal requirements of light vehicle steering systems and tyres.
- Suitable test methods for steering systems and tyres.

Grading descriptors

Pass:

LO1: Know about non-assisted steering components and light vehicle tyre technology.

- Identify the non-assisted steering components in a light vehicle.
- Understand the technical terms used with reference to types of tyre used on common light vehicles.
- Outline the purpose of the steering components with reference to notes.

LO2: Undertake routine maintenance on steering systems and light vehicle tyres.

- Undertake a tyre check, change and balance competently.
- Undertake a steering track rod end replacement, pre-checks and two-wheel alignment competently.

LO3: Review a steering system and tyres in terms of meeting legal requirements.

- Review actual readings to legal requirements for light vehicle steering systems and identify the differences.
- Review actual readings to legal requirements for light vehicle tyres and identify the differences.

Use some of the technical terms associated with steering system and tyres.

LO1: Know about non-assisted steering components and light vehicle tyre technology.

- Outline the non-assisted steering components in a light vehicle.
- Understand and use the technical terms used with reference to types of tyre used on common light vehicles.
- Describe the purpose of the steering components with reference to notes.

LO2: Undertake routine maintenance on steering systems and light vehicle tyres.

- Undertake a tyre check, change and balance confidently.
- Undertake a steering track rod end replacement, pre-checks and two-wheel alignment confidently.

LO3: Review a steering system and tyres in terms of meeting legal requirements.

- Review actual readings to legal requirements for light vehicle steering systems and describe the differences.
- Review actual readings to legal requirements for light vehicle tyres and describe the differences.
- Use technical terms associated with steering system and tyres most of the time.

Distinction:

LO1: Know about non-assisted steering components and light vehicle tyre technology.

- Describe the non-assisted steering components in a light vehicle.
- Understand and use accurately the technical terms used with reference to types of tyre used on common light vehicles.
- Describe in detail the purpose of the steering components without reference to notes.

LO2: Undertake routine maintenance on steering systems and light vehicle tyres.

- Undertake a tyre check, change and balance skilfully.
- Undertake a steering track rod end replacement, pre-checks and two-wheel alignment skilfully.

LO3: Review a steering system and tyres in terms of meeting legal requirements.

- Review actual readings to legal requirements for light vehicle steering systems and describe the differences in detail with suggestions for repair or replacement.
- Review actual readings to legal requirements for light vehicle tyres and describe the differences in detail with suggestions for repair or replacement.
- Use technical terms associated with steering system and tyres throughout.

Assessment

The assessment for this outcome consists of:

The completion of a series of four linked practical tasks relating to light vehicle tyres and non-assisted steering systems to a given brief.

Types of evidence

The evidence will include; printed or photocopied technical information, photographic evidence, readings taken from the vehicle and a viva voce (captured on a digital recording device), in accordance with brief.

Delivery guidance

This unit introduces learners to the principles of vehicle steering systems and tyre technology. It covers the purpose and function of the main components and looks

at current light vehicle tyre technology. Tutors will use a wide range of teaching methods to deliver this unit e.g. formal lectures, videos, internet research, written materials, class discussions and presentations alongside practical investigations. A site visits to the Driver and Vehicles Standards Department would be an excellent method of allowing learners to see how testing is conducted in a real world environment. **Types of tyre used on light vehicles** could include; radial, tubeless, directional, asymmetric and temporary use/space saver. **Terms associated with tyres** could include; the width, profile, diameter, speed rating, load index and plies. **Types of wheel used on light vehicles** could include; steel, alloy and split rim. **The main components in non-assisted steering systems and their purpose** could include; the steering wheel, steering column, steering rack and pinion assembly, track rods, track rod ends and the rubber gaiters. **The correct procedures to remove and refit a standard tubeless tyre to a road wheel** could include; deflation of tyre before commencing, breaking of bead from wheel rim, removal of tyre from rim, inspection and preparation of wheel prior to refitting, lubricating tyre bead prior to refitting, correct refitting of tyre to rim (direction) and Inflation of tyre to correct pressure. **The correct procedures to balance a standard wheel and tyre** could include; removal of old weights, safe mounting of tyre to balancer, setting of balancer, use of balancer, fitment of correct weights and rechecking of balance. **Correct procedures when removing and refitting a track rod end** could include; using appropriate PPE and VPE, a logical working order, correct use of tools and equipment, selection of relevant information and approximate adjustment after refitting to aid alignment of the wheels. **Correct method for adjusting front wheel alignment to within manufacturers tolerance** could include; pre-adjustment vehicle checks, (correct positioning/loading of vehicle, tyre pressures, calibration of equipment), correct use of equipment and care of vehicle. **The legal requirements of light vehicle steering systems** could include; the amount of free play at the wheel, any free play in the steering joints, the condition of gaiters and the ball joint covers. **The legal requirements of light vehicle tyres** could include; the minimum legal tread depth, sidewall cuts and damage and tyre mixing. **Suitable test methods for steering systems and tyres** could include; visual inspection, wheel play detectors and tread depth gauges.

Unit 10– Light Vehicle Braking Systems

Unit summary

This unit will introduce you to the principles of vehicle braking systems, components and operation. It covers the identification of the main components used in the braking system, along with the purpose and routine maintenance of these components.

Guided learning hours

48 hours

Level

2

Learning outcome 1

The learner will: Understand non-ABS vehicle braking system components.

The learner must know about:

- The main components used in vehicle braking systems and their purpose.
- The main operating principles of braking systems.
- Terms associated with braking systems.

Learning outcome 2

The learner will: Conduct routine maintenance on vehicle braking systems.

The learner must demonstrate:

- Selection of technical data for routine maintenance of vehicle braking systems.
- Safe working procedures when removing and replacing brake pads and shoes, adjusting handbrake mechanisms and bleeding brakes.
- The ability to conduct tests to the braking system for correct performance.

Learning outcome 3

The learner will: Review the operation of the braking system to within legal limits.

The learner must consider:

- The wear readings of the mechanical components in the braking system, and a comparison of the actual reading to the manufacturers specifications.
- The footbrake and handbrake torque performance and a comparison of the actual reading against the legal limits.
- The boiling/vaporisation point of the brake fluid, and a comparison of the actual reading with the manufacturers limit.

Grading descriptors

Pass:

LO1: Understand non-ABS vehicle braking system components

- Identify the main components in a light vehicle braking system.
- Identify the purpose of the main components in a light vehicle braking system.
- Use some of the technical terms associated with braking systems (from notes).

LO2: Conduct routine maintenance on vehicle braking systems.

- Conduct a brake inspection competently.
- Conduct a brake test competently.
- Use safe working procedures competently when removing and replacing brake pads and brake shoes, adjusting handbrake mechanisms and bleeding brakes.

LO3: Review the operation of the braking system to within legal limits.

- Compare the wear readings of the mechanical components with manufacturer's specifications using some technical terms.
- Compare the footbrake and handbrake torque performance readings against the legal limits using some technical terms.
- Compare the boiling/vaporisation point of the brake fluid readings with the manufacturers limit using some technical terms.

Merit:	<p>LO1: Understand non-ABS vehicle braking system components</p> <ul style="list-style-type: none"> • Identify the main components in a light vehicle braking system. • Outline the purpose of the main components in a light vehicle braking system. • Use technical terms associated with braking systems most of the time (from notes). <p>LO2: Conduct routine maintenance on vehicle braking systems.</p> <ul style="list-style-type: none"> • Conduct a brake inspection confidently. • Conduct a brake test confidently. • Use safe working procedures confidently when removing and replacing brake pads and brake shoes, adjusting handbrake mechanisms and bleeding brakes. <p>LO3: Review the operation of the braking system to within legal limits.</p> <ul style="list-style-type: none"> • Compare the wear readings of the mechanical components with manufacturer's specifications using technical terms most of the time. • Compare the footbrake and handbrake torque performance readings against the legal limits using technical terms most of the time. • Compare the boiling/vaporisation point of the brake fluid readings with the manufacturers limit using technical terms most of the time.
Distinction:	<p>LO1: Understand non-ABS vehicle braking system components</p> <ul style="list-style-type: none"> • Identify the main components in a light vehicle braking system. • Describe the purpose of the main components in a light vehicle braking system. • Use technical terms associated with braking systems most of the time (from memory). <p>LO2: Conduct routine maintenance on vehicle braking systems.</p> <ul style="list-style-type: none"> • Conduct a brake inspection skilfully. • Conduct a brake test skilfully. • Use safe working procedures skilfully when removing and replacing brake pads and brake shoes, adjusting handbrake mechanisms and bleeding brakes. <p>LO3: Review the operation of the braking system to within legal limits.</p> <ul style="list-style-type: none"> • Compare the wear readings of the mechanical components with manufacturer's specifications using only technical terms. • Compare the footbrake and handbrake torque performance readings against the legal limits using only technical terms. • Compare the boiling/vaporisation point of the brake fluid readings with the manufacturers limit using only technical terms.

Assessment

The assessment for this outcome consists of:

- Completion of a practical assessment where learners will conduct a brake inspection and test during which the learner will be assessed on their knowledge of the main braking system components and the purpose of these components (notes may be used).
- A short written or oral report (400 words or 10 minute presentation) covering a review of the readings obtained compared to the manufacturers, the legal requirements (using technical terms) and suggestions for alternative testing methods.

Types of evidence

- Oral question sheet signed by the assessor.
- Photographic or short video of key points in the practical activity (a signed witness testimony would also be suitable for this).
- A short written (or viva voce) report (400 words or 10 minute) covering a review of the readings obtained compared to the requirements, using technical terms and suggestions for alternative testing methods.

Delivery guidance

This unit covers the purpose and function of the main components of the braking system and looks at how to test them. Tutors will be encouraged to use a wide range of teaching methods to deliver this unit e.g. formal lectures, videos, internet research, written materials, class discussions and presentations alongside practical investigations where the students can develop their hand skills in preparation for the assessment in LO2. A site visits to the Driver and Vehicles Standards Department would be an excellent way to show learners how testing is conducted in a real world environment.

The main components used in vehicle braking systems and their purpose could include; drum brakes, brake pedal, brake shoes, leading shoe, trailing shoe, adjusters, return springs, backing plate, drum parking brake mechanism, brake pads, brake calliper and pistons, brake disc, single and dual line layout master cylinders, wheel cylinders, brake lines and flexible hoses, brake servo and brake fluid. **The main operating principles of braking systems** could include; converting kinetic energy to heat energy, coefficient of friction between brake shoes and brake drum and brake pad and brake disc, advantages of drum brakes and disc brakes, action of leading and trailing brake shoes (self-servo action), action of disc brakes pad retraction, the effect of air in the system. **Terms associated with braking systems**, could include: braking efficiency, brake fade, brake balance, ABS and split braking systems. **Selection of technical data for routine maintenance of vehicle braking systems** could include; torque settings, maintenance schedules, and legal requirements. **Safe working procedures** could include; using appropriate PPE and VPE, the use of correct tools, adjustments

following refitting, checking system operation, prevention of brake fluid contamination on vehicle paintwork, following the correct bleeding sequence and topping up the fluid level. **Conducting tests to the braking system to ensure correct performance** could include; conducting a dynamic brake test (foot and handbrake efficiency, brake balance split) and measuring the boiling/vaporisation point of the brake fluid.

Appendices

Appendix I - Extenuating Circumstances Form

(Must be fully completed and accompanied by independent supportive evidence, e.g. a letter from your GP/doctor/counsellor on headed paper or other official document. The form and evidence must be sent to the Registry Department in Nightingale building AS SOON AS POSSIBLE after the circumstances begin. Retrospective claims received within 10 working days will only be considered if there are exceptional circumstances which prevent the early submission of a claim form.)

Name of candidate				
HC number				
Course name and year				
Date circumstances started				
Date circumstances ended				
Assessment(s) affected (complete below)				
Unit code	Unit tutor	Type of assessment (e.g. exam coursework, presentation)	Assessment deadline	Is this group work?
Description of circumstances				
Signature				
Date				

Appendix II - Candidate Appeal Form

(To be completed if informal Stage 1 appeal is unresolved)

Name of candidate	
Name of assessor	
Name of internal verifier	
Date of assessment	
Unit(s) assessed	
Date appeal received	
Date of Stage 1 decision <small>(within 5 working days of assessment decision)</small>	

Stage 1:	
Assessment details	
Candidate's reasons for appeal	
Assessor decision	
Candidate's signature and date	I agree with the decision: YES / NO
Assessor's signature and date	

Stage 2:	
Date appeal received by internal verifier	
Internal verifier's comments and decision <small>(within 10 working days of assessment decision)</small>	
Candidate's signature and date	I agree with the decision: YES / NO
Internal verifier's signature and date	

Appendix III – Assessment Brief Template

	Progression Qualification in Subject name here		
Unit No. / Title			
Assessment No.		This work assesses:	
Issue Date:		Due Date:	
<p>In this assignment, you will [continue writing vocational/technical scenario]:</p>			
<p>During this assessment you are also required to demonstrate speaking and listening skills/ written communication skills/ mathematical skills [delete as appropriate]</p>			
Learning Outcome 1:	The learner will		
Task 1:			
Task details	<p>Image here</p> <p>[visual reinforcement to aid readability of assignment]</p>		
<p>You must/ should/ could produce the following evidence:</p>			
<ul style="list-style-type: none"> ✓ A written report ✓ A presentation ✓ A practical assessment ✓ These are just examples [delete as appropriate] 			

Learning Outcome 2: The learner will	
Task 2: Delete if necessary	
Task details Delete if necessary	Image here
You must/ should/ could produce the following evidence:	
<ul style="list-style-type: none"> ✓ A written report ✓ A presentation ✓ A practical assessment ✓ These are just examples [delete as appropriate] 	
Learning Outcome 3: The learner will	
Task 3: Delete if necessary	
Task details Delete if necessary	Image here
You must/ should/ could produce the following evidence:	
<ul style="list-style-type: none"> ✓ A written report ✓ A presentation ✓ A practical assessment ✓ These are just examples [delete as appropriate] 	
Grading Descriptors	
Pass	Merit
	Distinction

Appendix IV – Assessment Brief Internal Verification Template

	Progression Qualification in Subject name here	
---	---	---

VERIFICATION OF ASSESSMENT

JPQ Title	
------------------	--

Unit No. / Title	
-------------------------	--

Assessor		Internal Verifier	
-----------------	--	--------------------------	--

Assessment No.		Lead Verifier	
-----------------------	--	----------------------	--

Verifier Checklist	Comments
--------------------	----------

Are accurate qualification details shown?	Y/N	
---	-----	--

Are accurate unit details shown?	Y/N	
----------------------------------	-----	--

Are clear deadlines for assessment given?	Y/N	
---	-----	--

Is the timescale for the assessment appropriate?	Y/N	
--	-----	--

What are the Learning Outcomes being assessed?		
--	--	--

Do the grading descriptors identified match the Learning Outcomes being assessed?	Y/N	
---	-----	--

Are the appropriate English and maths skills identified on the assessment?	Y/N	
--	-----	--

Will the tasks enable the learner to generate sufficient evidence to be assessed against the range of grading descriptors?	Y/N	
--	-----	--

Is the language and presentation used accessible to most learners?	Y/N	
--	-----	--

Are the tasks set appropriate for most learners' current and expected level of knowledge/skill?	Y/N	
Is it possible to authenticate the learner's individual evidence through this assessment?	Y/N	
Is the method of assessment reliable?	Y/N	
Overall, is the assignment fit for purpose?	Y/N*	
*If 'No' is recorded and the Verifier recommends remedial action before the brief is issued, the Assessor and the Verifier should confirm that the action has been undertaken		
Assessor signature		Date
Verifier signature		Date
Lead Verifier signature (if required)		Date
Agreed remedial action required/taken		
Assessor signature		Date
Verifier signature		Date
Lead Verifier signature (if required)		Date

Appendix V– Internal Verification Template for Assessment Decisions

ncfe.		Progression Qualification in <i>Subject name here</i>			
VERIFICATION – ASSESSMENT DECISIONS					
JPQ Title					
Unit(s)					
Assessor				Internal Verifier	
Assignment No.				Lead Verifier	
Name of Learner <small>(For larger samples, please add rows or use additional sheets)</small>	Submission Type <small>(First, Resubmission, Retake)</small>	State grade awarded	Assessment Decision Accurate (Y/N)	Comments	

VERIFIER CHECKLIST		Please give reasons for responses including evidence of judgements and good practice.
Is the assessed evidence valid? (Reflect current standards, practice/assessment requirements?)	Y/N	
Is the assessed evidence authentic? (Confirmed by both the learner and assessor?)	Y/N	
Is the assessed evidence current? (Produced, submitted and assessed within a relevant time frame?)	Y/N	
Is the assessed evidence sufficient? (Evidence matches the assessment outcome?)	Y/N	
Is the assessed evidence reliable? (Judgements consistent across all learners, over time and across levels?)	Y/N	
Does the feedback from the assessor confirm achievement?	Y/N	
Is the feedback constructive? (Clearly outline what has been done well, how to improve and clear targets set?)	Y/N	
Does the feedback address the English and maths needs of the students? (e.g. spelling, grammar and punctuation corrected using agreed approach; maths framework used)	Y/N	

Any actions required must be reviewed across the whole cohort.

Action Required	Target Date for Completion

I confirm that the assessment decisions are accurate, there is no evidence of assessment malpractice and any action points have been addressed and completed in respect of the whole cohort.

Verifier signature		Date	
Assessor signature		Date	
Lead Verifier signature (if appropriate)		Date	