Pearson BTEC Level 3 Foundation Award in Advanced Manufacturing Engineering (Development Technical Knowledge)

Pearson BTEC Level 3 Award in Advanced Manufacturing Engineering (Development Technical Knowledge)

Pearson BTEC Level 3 Certificate in Advanced Manufacturing Engineering (Development Technical Knowledge)

Pearson BTEC Level 3 Diploma in Advanced Manufacturing Engineering (Development Technical Knowledge)

Pearson BTEC Level 3 Extended Diploma in Advanced Manufacturing Engineering (Development Technical Knowledge)

Specification

BTEC Specialist qualification

First registration September 2016

Issue 6

About Pearson

We are the world's leading learning company operating in countries all around the world. We provide content, assessment and digital services to schools, colleges and universities, as well as professional and vocational education to learners to help increase their skills and lifelong employability prospects. We believe that wherever learning flourishes so do people.

This specification is Issue 6. Key changes are summarised on the next page. We will inform centres of any changes to this issue. The latest issue can be found on our website.

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All information in this specification is correct at time of publication.

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Summary of changes to Pearson BTEC Level 3 Award/Certificate/Diploma/ Extended Diploma in Advanced Manufacturing Engineering (Development Technical Knowledge) specification

Issue 6

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Earlier issues show previous changes.

If you need further information on these changes or what they mean, please contact us via our website at: qualifications.pearson.com/en/support/contact-us.html.

Contents

1 Introducing the qualifications

What are BTEC Specialist qualifications?

BTEC Specialist qualifications are work-related qualifications available from Entry to Level 3. The qualifications put learning into the context of the world of work, giving students the opportunity to apply their research, skills and knowledge in relevant and realistic work contexts. This applied, practical approach means learners build the knowledge, understanding and skills they need for career progression or further study.

Sizes of BTEC Specialist qualifications

For all regulated qualifications, Pearson specifies a total estimated number of hours that learners will require to complete and show achievement for the qualification – this is the Total Qualification Time (TQT). The TQT value indicates the size of a qualification.

Within the TQT, Pearson identifies the number of Guided Learning Hours (GLH) we estimate a centre delivering a qualification might provide. Guided learning means activities, such as lessons, tutorials, online instruction, supervised study and giving feedback on performance, that directly involve tutors and assessors in teaching, supervising and invigilating learners. It also includes the time required for learners to complete external assessment under examination or supervised conditions.

In addition to guided learning, other required learning directed by tutors or assessors includes private study, preparation for assessment and undertaking assessment when not under supervision, such as preparatory reading, revision and independent research.

As well as TQT and GLH, qualifications can also have a credit value – equal to one tenth of the TQT, rounded to the nearest whole number.

TQT and credit values are assigned after consultation with the employers and training providers delivering the qualifications.

Qualification purpose

The Pearson BTEC Level 3 in Advanced Manufacturing Engineering (Development Technical Knowledge) are for learners who are working in, or who are intending to work in the engineering sector.

The Pearson BTEC Level 3 Foundation Award/Award/Certificate/Diploma/Extended Diploma in Advanced Manufacturing Engineering (Development Technical Knowledge) are suitable for learners to:

- achieve a qualification to prepare for employment
- study mandatory units, including the following topics:
  - communication for engineering technicians
  - mathematics for engineering technicians
  - health and safety in the engineering workplace.
- develop the knowledge, understanding and skills required in Apprenticeship Frameworks and Standards in England, Wales and Northern Ireland. This includes areas such as calculus, engineering drawing, vehicle engine systems and business operations in engineering
- develop a range of positive attitudes and professional attributes that support successful performance in the manufacturing engineering work environment
- achieve a nationally-recognised Level 3 qualification
- develop own personal growth and engagement in learning.

Purpose of the Pearson BTEC Level 3 Foundation Award in Advanced Manufacturing Engineering (Development Technical Knowledge)

The Level 3 Foundation Award in Advanced Manufacturing Engineering (Development Technical Knowledge) has been designed as a standalone qualification for learners aged over 16 who require a smaller sized qualification as part of a programme of study. It also allows learners who do not meet the certification requirements for the larger sizes of qualification to achieve a recognised qualification. It provides optional units covering a range of areas of study within engineering.

Purpose of the Pearson BTEC Level 3 Award in Advanced Manufacturing Engineering (Development Technical Knowledge)

The Level 3 Award in Advanced Manufacturing Engineering (Development Technical Knowledge) has been designed to meet the minimum requirements of the Foundation phase of many of the Trailblazer standards, including the Mechatronics Maintenance Technician. This qualification can also be delivered as a standalone qualification to learners aged over 16 as part of a programme of study. It has been designed to provide a basic understanding of engineering principles, including maths and science.

Purpose of the Pearson BTEC Level 3 Certificate in Advanced Manufacturing Engineering (Development Technical Knowledge)

The Level 3 Certificate in Advanced Manufacturing Engineering (Development Technical Knowledge) has been designed to meet the requirements of the Foundation phase of many of the Trailblazer standards in Engineering, including the Mechatronics Maintenance Technician. It is for learners, providers and employers who wish to complete more knowledge units in order to progress to an Extended Diploma in the Development Phase. This qualification can also be delivered as a standalone qualification to learners aged over 16 as part of a programme of study. It enables learners to complete additional optional units to allow for greater specialism in their chosen areas.

Purpose of the Pearson BTEC Level 3 Diploma in Advanced Manufacturing Engineering (Development Technical Knowledge)

The Level 3 Diploma in Advanced Manufacturing Engineering (Development Technical Knowledge) has been designed to meet the minimum requirements of the Development phase of many of the Trailblazer standards in Engineering, including the Mechatronics Maintenance Technician. This qualification can also be delivered as a standalone qualification to learners aged over 16 as part of a programme of study. It has been designed as a progression opportunity from the Award and includes the same mandatory units. Learners completing the Diploma will have to complete a number of additional optional units to meet the minimum requirements, and the structure will allow employers to select optional units that meet the needs of their business. The achievement of this qualification is part of the gateway process towards End-Point Assessment and contributes to learners achieving their Apprenticeship Standard.

Purpose of the Pearson BTEC Level 3 Extended Diploma in Advanced Manufacturing Engineering (Development Technical Knowledge)

The Level 3 Extended Diploma in Advanced Manufacturing Engineering (Development Technical Knowledge) has been designed for learners, providers or employers who wish to complete a larger size qualification as part of their on-programme delivery and assessment activity, or as part of a standalone programme to learners aged over 16 as part of a programme of study. The larger size will enable learners to select a greater number of optional units in their specialist areas as required by their employers and will also enable easier progression to higher education.

Industry support and recognition

These qualifications are supported by:

- the Advanced Engineering and Manufacturing Apprenticeship Employer Group, which includes Jaguar Land Rover, Toyota, Ford, BMW, Vauxhall, Aston Martin, Nissan, GTA England
- the Institution of Engineering and Technology (IET) professional society for the engineering and technology community
- the Institution of Mechanical Engineers (IMechE) professional engineering institution
- Semta, the Sector Skills Council for the Engineering sector
- the National Forum of Engineering Centres (NFEC).

Funding

Qualifications eligible and funded for post-16-year-olds can be found on the funding Hub. The Apprenticeship funding rules can be found at www.gov.uk.

2 Qualification summary and key information

Qualification title	Pearson BTEC Level 3 Foundation Award in Advanced Manufacturing Engineering (Development Technical Knowledge)
Qualification Number (QN)	603/5840/3
Regulation start date	28/04/2020
Operational start date	01/09/2020
Approved age ranges	16–18 19+ Please note that sector-specific requirements or regulations may prevent learners of a particular age from taking this qualification. Please refer to *Section 7: Access to qualifications*.
Total Qualification Time (TQT)	248
Guided learning hours (GLH)	180
Assessment	Internal assessment.
Grading information	The qualification and units are graded Pass/Merit/Distinction.
Entry requirements	No prior knowledge, understanding, skills or qualifications are required before learners register for this qualification. In order to optimise success candidates will typically have four GCSEs at Grade C/4 or equivalent, including Mathematics, English and a Science. Where this qualification is offered as part of an Apprenticeship, employers who recruit candidates without English or Maths at Grade C/4 or above must ensure that the candidate achieves this standard before completing the Apprenticeship. Centres must also follow the Pearson Access and Recruitment policy (see *Section 7: Access to qualifications*).

Qualification title	Pearson BTEC Level 3 Award in Advanced Manufacturing Engineering (Development Technical Knowledge)
Qualification Number (QN)	601/9053/X
Regulation start date	20/06/2016
Operational start date	01/09/2016
Approved age ranges	16–18 19+ Please note that sector-specific requirements or regulations may prevent learners of a particular age from taking this qualification. Please refer to *Section 7: Access to qualifications.*
Total Qualification Time (TQT)	492
Guided learning hours (GLH)	360
Assessment	Internal assessment.
Grading information	The qualification and units are graded Pass/Merit/Distinction.
Entry requirements	No prior knowledge, understanding, skills or qualifications are required before learners register for this qualification. In order to optimise success candidates will typically have four GCSEs at Grade C/4 or equivalent, including Mathematics, English and a Science. Where this qualification is offered as part of an Apprenticeship, employers who recruit candidates without English or Maths at Grade C/4 or above must ensure that the candidate achieves this standard before completing the Apprenticeship. Centres must also follow the Pearson Access and Recruitment policy (see *Section 7: Access to qualifications*).

Qualification title	Pearson BTEC Level 3 Certificate in Advanced Manufacturing Engineering (Development Technical Knowledge)
Qualification Number (QN)	601/9049/8
Regulation start date	20/06/2016
Operational start date	01/09/2016
Approved age ranges	16–18 19+ Please note that sector-specific requirements or regulations may prevent learners of a particular age from taking this qualification. Please refer to *Section 7: Access to qualifications*.
Total Qualification Time (TQT)	736
Guided learning hours (GLH)	540
Assessment	Internal assessment.
Grading information	The qualification and units are graded Pass/Merit/Distinction.
Entry requirements	No prior knowledge, understanding, skills or qualifications are required before learners register for this qualification. In order to optimise success candidates will typically have four GCSEs at Grade C/4 or equivalent, including Mathematics, English and a Science. Where this qualification is offered as part of an Apprenticeship, employers who recruit candidates without English or Maths at Grade C/4 or above must ensure that the candidate achieves this standard before completing the Apprenticeship. Centres must also follow the Pearson Access and Recruitment policy (see *Section 7: Access to qualifications*).

Qualification title	Pearson BTEC Level 3 Diploma in Advanced Manufacturing Engineering (Development Technical Knowledge)
Qualification Number (QN)	601/9054/1
Regulation start date	20/06/2016
Operational start date	01/09/2016
Approved age ranges	16–18 19+ Please note that sector-specific requirements or regulations may prevent learners of a particular age from taking this qualification. Please refer to *Section 7: Access to qualifications*.
Total Qualification Time (TQT)	982
Guided learning hours (GLH)	720
Assessment	Internal assessment.
Grading information	The qualification is graded Pass/Merit/Distinction. The internally assessed units are graded Pass/Merit/Distinction.
Entry requirements	No prior knowledge, understanding, skills or qualifications are required before learners register for this qualification. In order to optimise success candidates will typically have four GCSEs at Grade C/4 or equivalent, including Mathematics, English and a Science. Where this qualification is offered as part of an Apprenticeship, employers who recruit candidates without English or Maths at Grade C/4 or above must ensure that the candidate achieves this standard before completing the Apprenticeship. Centres must also follow the Pearson Access and Recruitment policy (see *Section 7: Access to qualifications*).

Qualification title	Pearson BTEC Level 3 Extended Diploma in Advanced Manufacturing Engineering (Development Technical Knowledge)
Qualification Number (QN)	601/9060/7
Regulation start date	20/06/2016
Operational start date	01/09/2016
Approved age ranges	16–18 19+ Please note that sector-specific requirements or regulations may prevent learners of a particular age from taking on this qualification. Please refer to *Section 7: Access to qualifications*.
Total Qualification Time (TQT)	1476
Guided learning hours (GLH)	1080
Assessment	Internal assessment.
Grading information	The qualification and units are graded Pass/Merit/Distinction.
Entry requirements	No prior knowledge, understanding, skills or qualifications are required before learners register for this qualification. In order to optimise success candidates will typically have four GCSEs at Grade C/4 or equivalent, including Mathematics, English and a Science. Where this qualification is offered as part of an Apprenticeship, employers who recruit candidates without English or Maths at Grade C/4 or above must ensure that the candidate achieves this standard before completing the Apprenticeship. Centres must also follow the Pearson Access and Recruitment policy (see *Section 7: Access to qualifications*).
Funding	Qualifications eligible and funded for post-16-year-olds can be found on the funding Hub. The Apprenticeship funding rules can be found at www.gov.uk.

3 Qualification structures

Advanced Manufacturing Engineering (Development Technical Knowledge), (Foundation Award)

The Level 3 Foundation Award in Advanced Manufacturing Engineering (Development Technical Knowledge), has been designed as a standalone qualification and allows learners to gain certification and progress to larger sizes of the engineering qualification.

The requirements outlined in the structure and units table below, must be met for Pearson to award the qualification.

Pearson BTEC Level 3 Foundation Award in Advanced Manufacturing Engineering (Development Technical Knowledge)

Minimum number of GLH that must be achieved	180	1 mandatory, at least 2 optional units
Number of mandatory GLH that must be achieved	60	
Number of optional GLH that must be achieved	120	

Advanced Manufacturing Engineering (Development Technical Knowledge), (Award/Certificate/Diploma/Extended Diploma)

The Level 3 Award/Certificate/Diploma/Extended Diploma in Advanced Manufacturing Engineering (Development Technical Knowledge), are designed as standalone qualifications and provide an understanding of the principles of the engineering industry. The larger sized qualifications allow for greater specialism for employers and progression to higher education.

The requirements outlined in the structure and units tables below must be met for Pearson to award the qualification.

Pearson BTEC Level 3 Award in Advanced Manufacturing Engineering (Development Technical Knowledge)

Minimum number of GLH that must be achieved	360	3 mandatory, at least 2 optional units
Number of mandatory GLH that must be achieved	180	
Number of optional GLH that must be achieved	180	

Pearson BTEC Level 3 Certificate in Advanced Manufacturing Engineering (Development Technical Knowledge)

Minimum number of GLH that must be achieved	540	3 mandatory, at least 5 optional units
Number of mandatory GLH that must be achieved	180	
Number of optional GLH that must be achieved	360	

Pearson BTEC Level 3 Diploma in Advanced Manufacturing Engineering (Development Technical Knowledge)

Minimum number of GLH that must be achieved	720	3 mandatory, at least 8 optional units
Number of mandatory GLH that must be achieved	180	
Number of optional GLH that must be achieved	540	

Pearson BTEC Level 3 Extended Diploma in Advanced Manufacturing Engineering (Development Technical Knowledge)

Minimum number of GLH that must be achieved	1080	3 mandatory, at least 14 optional units
Number of mandatory GLH that must be achieved	180	
Number of optional GLH that must be achieved	900	

Optional Qualification Pathways

The Pearson BTEC Level 3 in Advanced Manufacturing Engineering (Development Technical Knowledge) qualification provides learners with the opportunity to specialise in six optional pathways in the Diploma and Extended Diploma sizes. Each pathway has been designed as a standalone engineering qualification which is available in addition to the standard qualification.

The additional pathways are:

- Electrical/Electronic Engineering
- Mechanical Engineering
- Motorsports
- Medical Engineering
- Aerospace Engineering
- Robotic Engineering.

Pathway 1: Electrical/Electronic Engineering

The Electrical/Electronic Engineering pathway provides the learner with the opportunity to specialise into their chosen job role. Direct employment routes could include becoming an Electrical Engineering Technician and an Electronic Engineering Technician.

The requirements outlined in the structure and tables below must be met for Pearson to award the qualification with the Electrical/Electronic pathway.

Pearson BTEC Level 3 Diploma in Advanced Manufacturing Engineering (Electrical/Electronic Engineering) (Development Technical Knowledge)

Minimum number of GLH that must be achieved	720	5 mandatory, at least 6 optional units
Number of mandatory GLH that must be achieved	300	
Number of optional GLH that must be achieved	420	

Pearson BTEC Level 3 Extended Diploma in Advanced Manufacturing Engineering (Electrical/Electronic Engineering) (Development Technical Knowledge)

Minimum number of GLH that must be achieved	1080	5 mandatory, at least 12 optional units
Number of mandatory GLH that must be achieved	300	
Number of optional GLH that must be achieved	780	

Pathway 2: Mechanical Engineering

The Mechanical Engineering pathway provides the learner with the opportunity to specialise into their chosen job role. Direct employment routes could include becoming a Mechanical Fitter and Maintenance Technician.

The requirements outlined in the structure and tables below must be met for Pearson to award the qualification with the Mechanical Engineering pathway.

Pearson BTEC Level 3 Diploma in Advanced Manufacturing Engineering (Mechanical Engineering) (Development Technical Knowledge)

Minimum number of GLH that must be achieved	720	5 mandatory, at least 6 optional units
Number of mandatory GLH that must be achieved	300	
Number of optional GLH that must be achieved	420	

Pearson BTEC Level 3 Extended Diploma in Advanced Manufacturing Engineering (Mechanical Engineering) (Development Technical Knowledge)

Minimum number of GLH that must be achieved	1080	5 mandatory, at least 12 optional units
Number of mandatory GLH that must be achieved	300	
Number of optional GLH that must be achieved	780	

Pathway 3: Motorsports

The Motorsports pathway provides the learner with the opportunity to specialise into their chosen job role. Direct employment routes could include becoming a Motorsports Technician and a Motorsports Design Technician.

The requirements outlined in the structure and tables below must be met for Pearson to award the qualification with the Motorsports pathway.

Pearson BTEC Level 3 Diploma in Advanced Manufacturing Engineering (Motorsport) (Development Technical Knowledge)

Minimum number of GLH that must be achieved	720	4 mandatory, at least 7 optional units
Number of mandatory GLH that must be achieved	240	
Number of optional GLH that must be achieved	480	

Pearson BTEC Level 3 Extended Diploma in Advanced Manufacturing Engineering (Motorsport) (Development Technical Knowledge)

Minimum number of GLH that must be achieved	1080	4 mandatory, at least 13 optional units
Number of mandatory GLH that must be achieved	240	
Number of optional GLH that must be achieved	840	

Pathway 4: Medical Engineering

The Medical Engineering pathway provides the learner with the opportunity to specialise into their chosen job role. Direct employment routes could include becoming a Healthcare Engineering Technician.

The requirements outlined in the structure and tables below must be met for Pearson to award the qualification with the Medical Engineering pathway.

Pearson BTEC Level 3 Diploma in Advanced Manufacturing Engineering (Medical Engineering) (Development Technical Knowledge)

Minimum number of GLH that must be achieved	720	7 mandatory, at least 5 optional units
Number of mandatory GLH that must be achieved	420	
Number of optional GLH that must be achieved	300	

Pearson BTEC Level 3 Extended Diploma in Advanced Manufacturing Engineering (Medical Engineering) (Development Technical Knowledge)

Minimum number of GLH that must be achieved	1080	7 mandatory, at least 11 optional units
Number of mandatory GLH that must be achieved	420	
Number of optional GLH that must be achieved	660	

Pathway 5: Aerospace Engineering

The Aerospace Engineering pathway provides the learner with the opportunity to specialise into their chosen job role. Direct employment routes could include becoming an Aircraft Systems Fitter and Aircraft Maintenance Technician.

The requirements outlined in the structure and tables below must be met for Pearson to award the qualification with Aerospace Engineering pathway.

Pearson BTEC Level 3 Diploma in Advanced Manufacturing Engineering (Aerospace Engineering) (Development Technical Knowledge)

Minimum number of GLH that must be achieved	720	5 mandatory, at least 6 optional units
Number of mandatory GLH that must be achieved	300	
Number of optional GLH that must be achieved	420	

Pearson BTEC Level 3 Extended Diploma in Advanced Manufacturing Engineering (Aerospace Engineering) (Development Technical Knowledge)

Minimum number of GLH that must be achieved	1080	5 mandatory, at least 12 optional units
Number of mandatory GLH that must be achieved	300	
Number of optional GLH that must be achieved	780	

Pathway 6: Robotic Engineering

The Robotic Engineering pathway provides the learner with the opportunity to specialise into their chosen job role. Direct employment routes could include becoming a Physical Computing Engineer and a Robotic Systems Engineer.

The requirements outlined in the structure and tables below must be met for Pearson to award the qualification with the Robotic Engineering pathway.

Pearson BTEC Level 3 Diploma in Advanced Manufacturing Engineering (Robotic Engineering) (Development Technical Knowledge)

Minimum number of GLH that must be achieved	720	6 mandatory, at least 5 optional units
Number of mandatory GLH that must be achieved	360	
Number of optional GLH that must be achieved	360	

Pearson BTEC Level 3 Extended Diploma in Advanced Manufacturing Engineering (Robotic Engineering) (Development Technical Knowledge)

Minimum number of GLH that must be achieved	1080	6 mandatory, at least 11 optional units
Number of mandatory GLH that must be achieved	360	
Number of optional GLH that must be achieved	720	

4 Pathways

Advanced Manufacturing Engineering (Development Technical Knowledge), (Foundation Award)

The Level 3 Foundation Award in Advanced Manufacturing Engineering (Development Technical Knowledge) has been designed to allow learners who do not meet the certification requirements for larger size of qualifications. The qualification provides the opportunity for learners to study a range of units within engineering.

Qualification units table for Foundation Award

Unit number	Mandatory units	Level	GLH	How assessed
1	Health and Safety in the Engineering Workplace	3	60	Internal

Unit number	Optional units	Level	GLH	How assessed
3	Mathematics for Engineering Technicians	3	60	Internal
7	Properties and Applications of Engineering Materials	3	60	Internal
8	Mechanical Principles of Engineering Systems	3	60	Internal
9	Applications of Mechanical Systems in Engineering	3	60	Internal
12	Engineering Drawing for Technicians	3	60	Internal
16	Engineering Secondary and Finishing Techniques	3	60	Internal
17	Fabrication Processes and Technology	3	60	Internal
18	Welding Technology	3	60	Internal
19	Selecting and Using Programmable Controllers	3	60	Internal

Unit number	Optional units	Level	GLH	How assessed
20	Applications of Computer Numerical Control in Engineering	3	60	Internal
22	Computer-aided Manufacturing	3	60	Internal
24	Principles and Applications of Electronic Devices and Circuits	3	60	Internal
25	Engineering Maintenance Procedures and Techniques	3	60	Internal
26	Monitoring and Fault Diagnosis of Engineering Systems	3	60	Internal
30	Electronic Measurement and Testing	3	60	Internal
31	Features and Applications of Electrical Machines	3	60	Internal
35	Setting and Proving Secondary Processing Machines	3	60	Internal
43	Mechanical Measurement and Inspection Techniques	3	60	Internal
56	Electrical and Electronic Principles in Engineering	3	60	Internal
75	Microprocessor Systems and Applications	3	60	Internal

Advanced Manufacturing Engineering (Development Technical Knowledge), (Award/Certificate/Diploma/Extended Diploma)

The Level 3 Award/Certificate/Diploma/Extended Diploma in Advanced Manufacturing Engineering (Development Technical Knowledge), has been designed for learners to study a standalone engineering qualification. The qualification provides the opportunity for learners to study a range of mandatory and optional units to develop skills and knowledge in Advanced Manufacturing Engineering.

Qualification units table for Award, Certificate, Diploma and Extended Diploma

Unit number	Mandatory units	Level	GLH	How assessed
1	Health and Safety in the Engineering Workplace	3	60	Internal
2	Communications for Engineering Technicians	3	60	Internal
3	Mathematics for Engineering Technicians	3	60	Internal

Unit number	Optional units	Level	GLH	How assessed
4	Engineering Project	3	120	Internal
5	Calculus to Solve Engineering Problems	3	60	Internal
6	Further Engineering Mathematics	3	60	Internal
7	Properties and Applications of Engineering Materials	3	60	Internal
8	Mechanical Principles of Engineering Systems	3	60	Internal
9	Applications of Mechanical Systems in Engineering	3	60	Internal
10	Organisational Efficiency and Improvement	3	60	Internal
11	Electro, Pneumatic and Hydraulic Systems and Devices	3	60	Internal

Unit number	Optional units	Level	GLH	How assessed
12	Engineering Drawing for Technicians	3	60	Internal
13	Computer-aided Drafting in Engineering	3	60	Internal
14	Advanced Mechanical Principles and Applications	3	60	Internal
15	Engineering Primary Forming Processes	3	60	Internal
16	Engineering Secondary and Finishing Techniques	3	60	Internal
17	Fabrication Processes and Technology	3	60	Internal
18	Welding Technology	3	60	Internal
19	Selecting and Using Programmable Controllers	3	60	Internal
20	Applications of Computer Numerical Control in Engineering	3	60	Internal
21	Welding Principles	3	60	Internal
22	Computer-aided Manufacturing	3	60	Internal
23	Electronic Circuit Design and Manufacture	3	60	Internal
24	Principles and Applications of Electronic Devices and Circuits	3	60	Internal
25	Engineering Maintenance Procedures and Techniques	3	60	Internal
26	Monitoring and Fault Diagnosis of Engineering Systems	3	60	Internal
27	Principles and Applications of Engineering Measurement Systems	3	60	Internal
28	Electrical Technology	3	60	Internal
29	Electrical Installation	3	60	Internal
30	Electronic Measurement and Testing	3	60	Internal

Unit number	Optional units	Level	GLH	How assessed
31	Features and Applications of Electrical Machines	3	60	Internal
32	Three-phase Motors and Drives	3	60	Internal
33	Further Electrical Principles	3	60	Internal
34	Manufacturing Planning	3	60	Internal
35	Setting and Proving Secondary Processing Machines	3	60	Internal
36	Business Operations in Engineering	3	60	Internal
37	Industrial Plant and Process Control	3	60	Internal
38	Industrial Process Controllers	3	60	Internal
39	Principles and Operation of Three-phase Systems	3	60	Internal
40	Industrial Robot Technology	3	60	Internal
41	Vehicle Electronic Ancillary and Information Systems	3	60	Internal
42	Light Vehicle Suspension, Steering and Braking Systems	3	60	Internal
43	Mechanical Measurement and Inspection Techniques	3	60	Internal
44	Vehicle Engine Principles, Operation, Service and Repair	3	60	Internal
45	Vehicle System Fault Diagnosis and Rectification	3	60	Internal
47	Electrical and Electronic Principles for Vehicle Technology	3	60	Internal
48	Vehicle Electrical Charging and Starting Systems	3	60	Internal
49	Function and Operation of Vehicle Petrol Injection Systems	3	60	Internal
50	Diesel Fuel Injection Systems for Compression Ignition Engines	3	60	Internal

Unit number	Optional units	Level	GLH	How assessed
51	Operation and Testing of Vehicle Electronic Ignition Systems	3	60	Internal
52	Vehicle Engine Management Systems	3	60	Internal
53	Operation and Maintenance of Light Vehicle Transmission Systems	3	60	Internal
54	Operation of Vehicle Chassis Systems	3	60	Internal
55	Further Mechanical Principles and Applications	3	60	Internal
56	Electrical and Electronic Principles in Engineering	3	60	Internal
57	Helicopter Gas Turbine Engines, Transmission, Rotors and Structures	3	60	Internal
58	Aircraft Flight Principles and Practice	3	60	Internal
59	Airframe Construction and Repair	3	60	Internal
60	Airframe Mechanical Systems	3	60	Internal
61	Aircraft Electrical and Instrument Systems	3	60	Internal
62	Shipbuilding Principles	3	60	Internal
63	Utility System Maintenance	3	60	Internal
64	Operations Management and Costing	3	60	Internal
65	Engineering Design	3	60	Internal
66	Principles and Applications of Fluid Mechanics	3	60	Internal
67	Commercial Aspects of Engineering Organisations	3	60	Internal
68	Lean Production System Design	3	60	Internal
69	Statistics and Business Improvement Techniques	3	60	Internal

Unit number	Optional units	Level	GLH	How assessed
70	Applications of Thermodynamic Principles	3	60	Internal
71	Principles and Applications of Analogue Electronics	3	60	Internal
72	Construction and Applications of Digital Systems	3	60	Internal
73	Electronic Fault Finding	3	60	Internal
74	Advanced Composite Materials Manufacturing	3	60	Internal
75	Microprocessor Systems and Applications	3	60	Internal
76	Principles and Applications of Microcontrollers	3	60	Internal
90	Basic Polymer Technology	3	60	Internal
91	Plastics Materials	3	60	Internal
92	Plastics Processing	3	60	Internal
93	Polymer Process Engineering	3	60	Internal
94	Composite Materials and Processing	3	60	Internal
95	Aircraft Gas Turbine Engines	3	60	Internal
96	Human Factors and Performance in Aviation	3	90	Internal
97	Aircraft Radio and Radar Principles	3	60	Internal
101	Aircraft First Line Maintenance Operations	3	60	Internal
102	Industrial Process Measurement	3	60	Internal
103	Understanding and Using Fabrication Skills for Blacksmithing and Metal Working	3	60	Internal
104	Understanding and Using Fabrication Techniques for Blacksmithing and Metal Working	3	60	Internal
108	Industry 4.0	3	60	Internal

Unit number	Optional units	Level	GLH	How assessed
109	Data Analytics/Big Data	3	60	Internal
110	Simulation and Digital Twinning	3	60	Internal
111	Cyber Security in Engineering	3	60	Internal
112	Additive Manufacturing Processes	3	60	Internal
113	Autonomous Systems	3	60	Internal
114	Environmental Engineering and Sustainability	3	60	Internal
116	Installing and Commissioning Engineering Equipment	3	60	Internal
117	Battery Manufacturing	3	60	Internal
120	E-mobility	3	60	Internal

Pathway 1: Electrical/Electronic Engineering

The Electrical/Electronic Engineering pathway provides the learner with the opportunity to specialise their skills and knowledge in the electrical/electronics' area of engineering. Learners complete a mix of more general engineering units alongside specialist electrical/ electronic units to develop their understanding for a future role. This qualification can also be delivered as a standalone qualification to learners aged over 16 as part of a programme of study.

Electrical/Electronic Engineering pathway units table

Unit number	Pathway mandatory units	Level	GLH	How assessed
1	Health and Safety in the Engineering Workplace	3	60	Internal
2	Communications for Engineering Technicians	3	60	Internal
3	Mathematics for Engineering Technicians	3	60	Internal
33	Further Electrical Principles	3	60	Internal
56	Electrical and Electronic Principles in Engineering	3	60	Internal

Unit number	Pathway optional units	Level	GLH	How assessed
4	Engineering Project	3	120	Internal
5	Calculus to Solve Engineering Problems	3	60	Internal
6	Further Engineering Mathematics	3	60	Internal
8	Mechanical Principles of Engineering Systems	3	60	Internal
10	Organisational Efficiency and Improvement	3	60	Internal
12	Engineering Drawing for Technicians	3	60	Internal
19	Selecting and Using Programmable Controllers	3	60	Internal

Unit number	Pathway optional units	Level	GLH	How assessed
23	Electronic Circuit Design and Manufacture	3	60	Internal
24	Principles and Applications of Electronic Devices and Circuits	3	60	Internal
25	Engineering Maintenance Procedures and Techniques	3	60	Internal
26	Monitoring and Fault Diagnosis of Engineering Systems	3	60	Internal
28	Electrical Technology	3	60	Internal
29	Electrical Installation	3	60	Internal
30	Electronic Measurement and Testing	3	60	Internal
31	Features and Applications of Electrical Machines	3	60	Internal
32	Three-phase Motors and Drives	3	60	Internal
36	Business Operations in Engineering	3	60	Internal
38	Industrial Process Controllers	3	60	Internal
39	Principles and Operation of Three-phase Systems	3	60	Internal
40	Industrial Robot Technology	3	60	Internal
41	Vehicle Electronic Ancillary and Information Systems	3	60	Internal
48	Vehicle Electrical Charging and Starting Systems	3	60	Internal
61	Aircraft Electrical and Instrument Systems	3	60	Internal
71	Principles and Applications of Analogue Electronics	3	60	Internal
72	Construction and Applications of Digital Systems	3	60	Internal
73	Electronic Fault Finding	3	60	Internal
75	Microprocessor Systems and Applications	3	60	Internal

Unit number	Pathway optional units	Level	GLH	How assessed
76	Principles and Applications of Microcontrollers	3	60	Internal

Pathway 2: Mechanical Engineering

The Mechanical Engineering pathway provides the learner with the opportunity to specialise their skills and knowledge in a mechanical area of engineering. Learners complete a mix of more general engineering units alongside specialist mechanical units to develop their understanding for a future role. This qualification can also be delivered as a standalone qualification to learners aged over 16 as part of a programme of study.

Mechanical Engineering pathway units table

Unit number	Pathway mandatory units	Level	GLH	How assessed
1	Health and Safety in the Engineering Workplace	3	60	Internal
2	Communications for Engineering Technicians	3	60	Internal
3	Mathematics for Engineering Technicians	3	60	Internal
8	Mechanical Principles of Engineering Systems	3	60	Internal
55	Further Mechanical Principles and Applications	3	60	Internal

Unit number	Pathway optional units	Level	GLH	How assessed
4	Engineering Project	3	120	Internal
5	Calculus to Solve Engineering Problems	3	60	Internal
6	Further Engineering Mathematics	3	60	Internal
7	Properties and Applications of Engineering Materials	3	60	Internal
9	Applications of Mechanical Systems in Engineering	3	60	Internal
10	Organisational Efficiency and Improvement	3	60	Internal
11	Electro, Pneumatic and Hydraulic Systems and Devices	3	60	Internal

Unit number	Pathway optional units	Level	GLH	How assessed
12	Engineering Drawing for Technicians	3	60	Internal
13	Computer-aided Drafting in Engineering	3	60	Internal
14	Advanced Mechanical Principles and Applications	3	60	Internal
19	Selecting and Using Programmable Controllers	3	60	Internal
25	Engineering Maintenance Procedures and Techniques	3	60	Internal
26	Monitoring and Fault Diagnosis of Engineering Systems	3	60	Internal
37	Industrial Plant and Process Control	3	60	Internal
38	Industrial Process Controllers	3	60	Internal
40	Industrial Robot Technology	3	60	Internal
43	Mechanical Measurement and Inspection Techniques	3	60	Internal
56	Electrical and Electronic Principles in Engineering	3	60	Internal
60	Airframe Mechanical Systems	3	60	Internal
66	Principles and Applications of Fluid Mechanics	3	60	Internal
67	Commercial Aspects of Engineering Organisations	3	60	Internal
70	Applications of Thermodynamic Principles	3	60	Internal

Pathway 3: Motorsports

The Motorsport pathway provides the learner with the opportunity to specialise their skills and knowledge in a motorsport area of engineering. Learners complete a mix of more general engineering units alongside specialist motorsport units to develop their understanding for a future role. This qualification can also be delivered as a standalone qualification to learners aged over 16 as part of a programme of study.

Motorsport pathway units table

Unit number	Mandatory units	Level	GLH	How assessed
1	Health and Safety in the Engineering Workplace	3	60	Internal
2	Communications for Engineering Technicians	3	60	Internal
3	Mathematics for Engineering Technicians	3	60	Internal

Unit number	Pathway mandatory unit	Level	GLH	How assessed
46	Applications of Vehicle Science and Mathematics	3	60	Internal

Unit number	Pathway optional units	Level	GLH	How assessed
4	Engineering Project	3	120	Internal
6	Further Engineering Mathematics	3	60	Internal
7	Properties and Applications of Engineering Materials	3	60	Internal
8	Mechanical Principles of Engineering Systems	3	60	Internal
12	Engineering Drawing for Technicians	3	60	Internal
13	Computer-aided Drafting in Engineering	3	60	Internal
17	Fabrication Processes and Technology	3	60	Internal

Unit number	Pathway optional units	Level	GLH	How assessed
41	Vehicle Electronic Ancillary and Information Systems	3	60	Internal
42	Light Vehicle Suspension, Steering and Braking Systems	3	60	Internal
44	Vehicle Engine Principles, Operation, Service and Repair	3	60	Internal
45	Vehicle System Fault Diagnosis and Rectification	3	60	Internal
47	Electrical and Electronic Principles for Vehicle Technology	3	60	Internal
48	Vehicle Electrical Charging and Starting Systems	3	60	Internal
49	Function and Operation of Vehicle Petrol Injection Systems	3	60	Internal
50	Diesel Fuel Injection Systems for Compression Ignition Engines	3	60	Internal
51	Operation and Testing of Vehicle Electronic Ignition Systems	3	60	Internal
52	Vehicle Engine Management Systems	3	60	Internal
53	Operation and Maintenance of Light Vehicle Transmission Systems	3	60	Internal
54	Operation of Vehicle Chassis Systems	3	60	Internal
56	Electrical and Electronic Principles in Engineering	3	60	Internal
66	Principles and Applications of Fluid Mechanics	3	60	Internal
105	Motorsport Workshop Practices	3	60	Internal
106	Motorsport Vehicle Preparation and Inspection	3	60	Internal
107	Professional Practice and Logistics for Motorsports	3	60	Internal

Unit number	Pathway optional units	Level	GLH	How assessed
118	Electric and Hybrid Vehicle Motors	3	60	Internal
119	Electric Vehicle Drives	3	60	Internal

Pathway 4: Medical Engineering

The Medical Engineering pathway provides the learner with the opportunity to specialise their skills and knowledge in a medical area of engineering. Learners complete a mix of more general engineering units alongside specialist medical units to develop their understanding for a future role. This qualification can also be delivered as a standalone qualification to learners aged over 16 as part of a programme of study.

Medical Engineering pathway units table

Unit number	Mandatory units	Level	GLH	How assessed
1	Health and Safety in the Engineering Workplace	3	60	Internal
2	Communications for Engineering Technicians	3	60	Internal
3	Mathematics for Engineering Technicians	3	60	Internal

Unit number	Pathway mandatory unit	Level	GLH	How assessed
56	Electrical and Electronic Principles in Engineering	3	60	Internal
77	The Role of the Medical Engineer	3	60	Internal
78	Acceptance Testing, Maintaining, Fault Finding and Decommissioning of Medical Equipment	3	60	Internal
79	Anatomy, Physiology and Measurement	3	60	Internal

Unit number	Pathway optional units	Level	GLH	How assessed
8	Mechanical Principles of Engineering Systems	3	60	Internal
11	Electro, Pneumatic and Hydraulic Systems and Devices	3	60	Internal

Unit number	Pathway optional units	Level	GLH	How assessed
66	Principles and Applications of Fluid Mechanics	3	60	Internal
80	ICT for Medical Engineers	3	60	Internal
81	Principles of Servicing Cardiovascular Equipment	3	60	Internal
82	Principles of Servicing Physiological Monitoring Equipment	3	60	Internal
83	Principles of Servicing Infusion Equipment	3	60	Internal
84	Principles of Servicing Medical Therapeutic Equipment	3	60	Internal
85	Principles of Servicing Operating Theatre and Surgical Equipment	3	60	Internal
86	Principles of Servicing Patient Beds, Trolleys, Operating Tables and Assistive Technology Equipment	3	60	Internal
87	Principles of Medical Imaging	3	60	Internal
88	Principles of Servicing Dental Equipment	3	60	Internal
89	Principles of Servicing Medical Laboratory Equipment	3	60	Internal

Pathway 5: Aerospace Engineering

The Aerospace Engineering pathway provides the learner with the opportunity to specialise their skills and knowledge in an aerospace area of engineering. Learners complete a mix of more general engineering units alongside specialist aerospace units to develop their understanding for a future role. This qualification can also be delivered as a standalone qualification to learners aged over 16 as part of a programme of study.

Aerospace Engineering pathway units table

Unit number	Mandatory units	Level	GLH	How assessed
1	Health and Safety in the Engineering Workplace	3	60	Internal
2	Communications for Engineering Technicians	3	60	Internal
3	Mathematics for Engineering Technicians	3	60	Internal

Unit number	Pathway mandatory units (learners complete two units: Unit 8 OR Unit 56, and Unit 58 OR Unit 98)	Level	GLH	How assessed
8	Mechanical Principles of Engineering Systems	3	60	Internal
56	Electrical and Electronic Principles in Engineering	3	60	Internal
58	Aircraft Flight Principles and Practice	3	60	Internal
98	Helicopter Aerodynamics and Flight Principles	3	60	Internal

Unit number	Pathway optional units	Level	GLH	How assessed
4	Engineering Project	3	120	Internal
5	Calculus to Solve Engineering Problems	3	60	Internal

Unit number	Pathway optional units	Level	GLH	How assessed
6	Further Engineering Mathematics	3	60	Internal
7	Properties and Applications of Engineering Materials	3	60	Internal
13	Computer-aided Drafting in Engineering	3	60	Internal
15	Engineering Primary Forming Processes	3	60	Internal
16	Engineering Secondary and Finishing Techniques	3	60	Internal
17	Fabrication Processes and Technology	3	60	Internal
18	Welding Technology	3	60	Internal
19	Selecting and Using Programmable Controllers	3	60	Internal
24	Principles and Applications of Electronic Devices and Circuits	3	60	Internal
33	Further Electrical Principles	3	60	Internal
43	Mechanical Measurement and Inspection Techniques	3	60	Internal
55	Further Mechanical Principles and Applications	3	60	Internal
59	Airframe Construction and Repair	3	60	Internal
60	Airframe Mechanical Systems	3	60	Internal
61	Aircraft Electrical and Instrument Systems	3	60	Internal
65	Engineering Design	3	60	Internal
74	Advanced Composite Materials Manufacturing	3	60	Internal
75	Microprocessor Systems and Applications	3	60	Internal
76	Principles and Applications of Microcontrollers	3	60	Internal

Unit number	Pathway optional units	Level	GLH	How assessed
95	Aircraft Gas Turbine Engines	3	60	Internal
96	Human Factors and Performance in Aviation	3	90	Internal
97	Aircraft Radio and Radar Principles	3	60	Internal
99	Aircraft Workshop Methods and Practice	3	60	Internal
100	Aircraft Propulsion Systems	3	60	Internal
101	Aircraft First Line Maintenance Operations	3	60	Internal
111	Cyber Security in Engineering	3	60	Internal
113	Autonomous Systems	3	60	Internal
114	Environmental Engineering and Sustainability	3	60	Internal
115	Aircraft Materials and Hardware	3	90	Internal
123	Aircraft Computers and Electronic Systems	3	60	Internal
124	Avionic Systems	3	60	Internal

Pathway 6: Robotic Engineering

The Robotic Engineering pathway provides the learner with the opportunity to specialise their skills and knowledge in a robotic area of engineering. Learners complete a mix of more general engineering units alongside specialist robotic units to develop their understanding for a future role. This qualification can also be delivered as a standalone qualification to learners aged over 16 as part of a programme of study.

Robotic Engineering pathway units table

Unit number	Mandatory units	Level	GLH	How assessed
1	Health and Safety in the Engineering Workplace	3	60	Internal
2	Communications for Engineering Technicians	3	60	Internal
3	Mathematics for Engineering Technicians	3	60	Internal

Unit number	Pathway mandatory units	Level	GLH	How assessed
76	Principles and Applications of Microcontrollers	3	60	Internal
121	Industrial Robotics	3	60	Internal
122	Autonomous Mobile Robotics	3	60	Internal

Unit number	Pathway optional units	Level	GLH	How assessed
4	Engineering Project	3	120	Internal
5	Calculus to Solve Engineering Problems	3	60	Internal
6	Further Engineering Mathematics	3	60	Internal
8	Mechanical Principles of Engineered Systems	3	60	Internal
10	Organisational Efficiency and Improvement	3	60	Internal

Unit number	Pathway optional units	Level	GLH	How assessed
11	Electro, Pneumatic and Hydraulic Systems and Devices	3	60	Internal
19	Selecting and Using Programmable Controllers	3	60	Internal
24	Principles and applications of Electronic Devices and Circuits	3	60	Internal
26	Monitoring and Fault Diagnosis of Engineering Systems	3	60	Internal
33	Further Electrical Principles	3	60	Internal
55	Further Mechanical Principles and Applications	3	60	Internal
56	Electric and Electronic Principles in Engineering	3	60	Internal
66	Principles and Applications of Fluid Mechanics	3	60	Internal
71	Principles and Applications of Analogue Electronics	3	60	Internal
72	Construction and Applications of Digital Systems	3	60	Internal
75	Microprocessor Systems and Applications	3	60	Internal
108	Industry 4.0	3	60	Internal
109	Data Analytics/Big Data	3	60	Internal
110	Simulation and Digital Twinning	3	60	Internal
111	Cyber Security in Engineering	3	60	Internal
112	Additive Manufacturing Processes	3	60	Internal
113	Autonomous Systems	3	60	Internal
114	Environmental Engineering and Sustainability	3	60	Internal

5 Assessment requirements

The table below gives a summary of the assessment methods used in the qualifications.

Units	Assessment methods
All units	Internal assessment (centre-devised assessments).

Language of assessment

Learners must use English only during the assessment of this qualification.

A learner taking the qualification may be assessed in British or Irish Sign Language where it is permitted for the purpose of reasonable adjustment.

Further information on the use of language in qualifications is available in our *Use of languages in qualifications policy*, available on our website, qualifications.pearson.com.

Internal assessment

Internally assessed units are subject to standards verification. This means that centres set and mark the final summative assessment for each unit, using the examples and support that Pearson provides.

To pass each internally assessed unit, learners must:

- achieve all the specified learning outcomes
- satisfy all the assessment criteria by providing sufficient and valid evidence for each criterion
- prove that the evidence is their own.

Centres must ensure:

- assessment is carried out by assessors with relevant expertise in both the occupational area and assessment. For the occupational area, this can be evidenced by a relevant qualification or current (within three years) occupational experience that is at an equivalent level or higher than this qualification. Assessment expertise can be evidenced by a qualification in teaching or assessing and/or internal quality assurance or current (within three years) experience of assessing or internal verification
- internal verification systems are in place to ensure the quality and authenticity of learners' work, as well as the accuracy and consistency of assessment.

Learners who do not successfully pass an assignment, are allowed to resubmit evidence for the assignment or to retake another assignment.

Assessment of knowledge units

To pass each knowledge unit, learners must independently complete assignment(s) that show that the learning outcomes and assessment criteria for the unit have been met.

Format of assignments for knowledge units:

- all learning outcomes and assessment criteria must be covered
- assignments can include both practical and written tasks
- assignments are independently completed as a distinct activity after the required teaching has taken place
- the brief is issued to learners with a defined start date, a completion date and clear requirements for the evidence they are required to produce
- all or parts of units can be combined into a single assignment.

Each unit contains suggested tasks that centres can use to form the basis of assignments for learners to complete. It is expected that centres will contextualise these and ensure that the final version is checked by their internal verifier.

Making valid assessment decisions

Authenticity of learner work

Once an assessment has begun, learners must not be given feedback on progress towards fulfilling the targeted criteria.

An assessor must assess only work that is authentic, i.e. learners' own independent work. Learners must authenticate the evidence that they provide for assessment through signing a declaration stating that it is their own work.

Assessors must ensure that evidence is authentic to a learner through setting valid assignments and supervising learners during assessment period. Assessors must take care not to provide direct input, instructions or specific feedback that may compromise authenticity.

Assessors must complete a declaration that:

- the evidence submitted for this assignment is the learner's own
- the learner has clearly referenced any sources used in the work
- they understand that false declaration is a form of malpractice.

Centres may use Pearson templates or their own templates to document authentication.

During assessment an assessor may suspect that some or all of the evidence from a learner is not authentic. The assessor must then take appropriate action using the centre's policies for malpractice. More information is given later in this section.

Making assessment decisions using unit-based criteria

Assessment decisions for the qualifications are based on the specific criteria given in each unit and set at each grade level. The assessment criteria for a unit are hierarchical and holistic. For example, if an M criterion requires the learner to show 'analysis' and the related P criterion requires the learner to 'explain', then to satisfy the M criterion a learner will need to cover both 'explain' and 'analyse'. The unit assessment grid shows the relationships between the criteria so that assessors can apply all the criteria to the learner's evidence at the same time.

Assessors make judgements using the criteria and must show how they have reached their decisions in the assessment records. The evidence from a learner can be judged using all the relevant criteria at the same time. The assessor needs to make a judgement against each criterion that evidence is present and sufficiently comprehensive. For example, the inclusion of a concluding section may be insufficient to satisfy a criterion requiring 'evaluation'.

Assessors should use the following information and support in reaching assessment decisions:

- the Assessment guidance section of each unit, which gives examples and definitions related to terms used in the assessment criteria
- the centre's Lead Internal Verifier and assessment team's collective experience supported by the information provided by Pearson.

When a learner has completed the assessment for a unit then the assessment team will give an assessment outcome for the unit. This is given according to the highest level for which the learner is judged to have met all the criteria. Therefore:

- to achieve a Distinction, a learner must have satisfied all the Distinction criteria (and therefore the Pass and Merit criteria); these define outstanding performance across the unit as a whole
- to achieve a Merit, a learner must have satisfied all the Merit criteria (and therefore the Pass criteria) through high performance in each learning outcome
- to achieve a Pass, a learner must have satisfied all the Pass criteria for the learning outcomes, showing coverage of the unit content and, therefore, attainment at the stated level of the qualification. The award of a Pass is a defined level of performance and cannot be given solely on the basis of a learner completing assignments. Learners who do not satisfy the Pass criteria should be reported as Unclassified.

Dealing with late completion of assignments

Learners must have a clear understanding of the centre's policy on completing assignments by the stated deadlines. Learners may be given authorised extensions for legitimate reasons, such as illness at the time of submission, in line with centre policies.

For assessment to be fair, it is important that learners are all assessed in the same way and that some learners are not advantaged by having additional time or the opportunity to learn from others.

If a late completion is accepted, then the assignment should be assessed normally using the relevant assessment criteria.

Issuing assessment decisions and feedback

Once the assessment team has completed the assessment process for an assignment, the outcome is a formal assessment decision. This is recorded formally and reported to learners.

The information given to the learner:

- must show the formal decision and how it has been reached, indicating how or where criteria have been met
- may show why attainment against criteria has not been demonstrated
- must not provide feedback on how to improve evidence
- must be validated by an Internal Verifier before it is given to the learner.

Resubmissions and retakes

Learners who do not successfully pass an assignment are allowed to resubmit evidence for the assignment or to retake another assignment. As a matter of best practice, it is recommended that centres apply the BTEC Firsts and Nationals retake and resubmission rules; however as these rules are not mandatory for BTEC Specialist programmes at Entry Level to Level 3 they do not need to be applied.

6 Centre recognition and approval

Centres must have approval prior to delivering or assessing any of the units in this qualification.

Centres that have not previously offered BTEC Specialist qualifications need to apply for, and be granted, centre recognition as part of the process for approval to offer individual qualifications.

Existing centres will be given 'automatic approval' for a new qualification if they are already approved for a qualification that is being replaced by a new qualification and the conditions for automatic approval are met.

Guidance on seeking approval to deliver BTEC qualifications is given on our website.

Approvals agreement

All centres are required to enter into an approval agreement with Pearson, in which the head of centre or principal agrees to meet all the requirements of the qualification specification and to comply with the policies, procedures, codes of practice and regulations of Pearson and relevant regulatory bodies. If centres do not comply with the agreement, this could result in the suspension of certification or withdrawal of centre or qualification approval.

Centre resource requirements

As part of the approval process, centres must make sure that the resource requirements below are in place before offering the qualifications:

- appropriate physical resources (for example IT, learning materials, teaching rooms) to support the delivery and assessment of the qualification
- suitable staff for delivering and assessing the qualification (see *Section 5 Assessment requirements*)
- systems to ensure continuing professional development (CPD) for staff delivering and assessing the qualifications
- health and safety policies that relate to the use of equipment by learners
- internal verification systems and procedures (see *Section 5 Assessment requirements*)
- any unit-specific resources stated in individual units.

7 Access to qualifications

Access to qualifications for learners with disabilities or specific needs.

Equality and fairness are central to our work. Our *Equity, diversity and inclusion policy* requires all learners to have equal opportunity to access our qualifications and assessments, and that our qualifications are awarded in a way that is fair to every learner.

We are committed to making sure that:

- learners with a protected characteristic (as defined by the Equality Act 2010) are not, when they are taking one of our qualifications, disadvantaged in comparison to learners who do not share that characteristic
- all learners achieve the recognition they deserve from their qualification and that this achievement can be compared fairly to the achievement of their peers.

For learners with disabilities and specific needs, the assessment of their potential to achieve the qualification must identify, where appropriate, the support that will be made available to them during delivery and assessment of the qualification(s).

Centres must deliver the qualification(s) in accordance with current equality legislation. For full details of the Equality Act 2010, please visit www.legislation.gov.uk

Reasonable adjustments and special consideration

Centres are permitted to make adjustments to assessment to take account of the needs of individual learners. Any reasonable adjustment must reflect the normal learning or working practice of a learner in a centre or a learner working in the occupational area.

Centres cannot apply their own special consideration – applications for special consideration must be made to Pearson and can be made on a case-by-case basis only.

Centres must follow the guidance in the Pearson document Guidance for reasonable adjustments and special consideration in vocational internally assessed units.

8 Recognising prior learning and achievement

Recognition of Prior Learning (RPL) considers whether a learner can demonstrate that they can meet the assessment requirements for a unit through knowledge, understanding or skills they already possess and so do not need to develop through a course of learning.

Pearson encourages centres to recognise learners' previous achievements and experiences in and outside the workplace, as well as in the classroom. RPL provides a route for the recognition of the achievements resulting from continuous learning.

RPL enables recognition of achievement from a range of activities using any valid assessment methodology. If the assessment requirements of a given unit or qualification have been met, the use of RPL is acceptable for accrediting a unit, units or a whole qualification. Evidence of learning must be sufficient, reliable and valid.

Further guidance is available in our policy document *Recognition of prior learning policy and process*, available on our website.

9 Quality assurance of centres

For the qualification in this specification, the Pearson quality assurance model will consist of the following processes.

Centres will receive at least one visit from our Standards Verifier, followed by ongoing support and development. This may result in more visits or remote support, as required to complete standards verification. The exact frequency and duration of Standards Verifier visits/remote sampling will reflect the level of risk associated with a programme, taking account of the:

- number of assessment sites
- number and throughput of learners
- number and turnover of assessors
- number and turnover of internal verifiers
- amount of previous experience of delivery.

Following registration, centres will be given further quality assurance and sampling guidance.

For further details, please see the work-based learning quality assurance handbooks, available in the support section of our website:

- *Pearson delivery guidance & quality assurance requirements – NVQs/SVQs*; *competence-based qualifications and BTEC Specialist qualifications.*

10 Units

All units for the Pearson Level 3 Advanced Manufacturing Engineering (Development Technical Knowledge) can be found in the additional *Unit Specification*. This includes unit content, assessment criteria, assessment guidance and essential resources.

11 Appeals

Centres must have a policy for dealing with appeals from learners. Appeals may relate to assessment decisions being incorrect or assessment not being conducted fairly. The first step in such a policy is a consideration of the evidence by a Lead Internal Verifier or other member of the programme team. The assessment plan should allow time for potential appeals after learners have been given assessment decisions.

Centres must document all learners' appeals and their resolutions. Further information on the appeals process can be found in the document *Internal assessment in vocational qualifications: Reviews and appeals policy*, available on our website.

12 Malpractice

Dealing with malpractice in assessment

'Malpractice' refers to acts that undermine the integrity and validity of assessment, the certification of qualifications and/or may damage the authority of those responsible for delivering the assessment and certification.

Pearson does not tolerate actual or attempted malpractice by learners, centre staff or centres in connection with Pearson qualifications. Pearson may impose sanctions on learners, centre staff or centres where malpractice or attempted malpractice has been proven.

Malpractice may occur or be suspected in relation to any unit or type of assessment within a qualification. For further details on malpractice and advice on preventing malpractice by learners, please see Pearson's Centre Guidance: Dealing with Malpractice, available on our website.

Centres are required to take steps to prevent malpractice and to assist with investigating instances of suspected malpractice. Learners must be given information that explains what malpractice is and how suspected incidents will be dealt with by the centre. The *Centre Guidance: Dealing with Malpractice* document gives full information on the actions we expect you to take.

Pearson may conduct investigations if we believe a centre is failing to conduct assessments according to our policies. The above document gives further information, examples, and details the sanctions that may be imposed.

In the interests of learners and centre staff, centres need to respond effectively and openly to all requests relating to an investigation into an incident of suspected malpractice.

Learner malpractice

The head of centre is required to report incidents of suspected learner malpractice that occur during the delivery of Pearson qualifications. We ask centres to complete *JCQ Form M1* (www.jcq.org.uk/malpractice) and email it with any supporting documents (signed statements from the learner, invigilator, copies of evidence, etc) to the Investigations Processing team at candidatemalpractice@pearson.com. The responsibility for determining any appropriate sanctions on learners lies with Pearson.

Learners must be informed at the earliest opportunity of the specific allegation and the centre's malpractice policy, including the right of appeal. Learners found guilty of malpractice may be disqualified from the qualification for which they have been entered with Pearson. Failure to report malpractice constitutes staff or centre malpractice.

Teacher/centre malpractice

The head of centre is required to inform Pearson's Investigations team of any incident of suspected malpractice (which includes maladministration) by centre staff, before any investigation is undertaken. The head of centre should inform the Investigations team by submitting a *JCQ M2 Form* (downloadable from www.jcq.org.uk/malpractice) with supporting documentation to pqsmalpractice@pearson.com. Where Pearson receives allegations of malpractice from other sources (for example Pearson staff, anonymous informants), the Investigations team will conduct the investigation directly or may ask the head of centre to assist.

Pearson reserves the right in cases of suspected malpractice to withhold the issuing of results/certificates while an investigation is in progress. Depending on the outcome of the investigation, results and/or certificates may not be released or they may be withheld.

You should be aware that Pearson may need to suspend certification when undertaking investigations, audits and quality assurances processes. You will be notified within a reasonable period of time if this occurs.

Sanctions and appeals

Where malpractice is proven, we may impose sanctions such as:

- mark reduction for affected assessments
- disqualification from the qualification
- debarment from registration for Pearson qualifications for a period of time.

If we are concerned about your centre's quality procedures we may impose sanctions such as:

- requiring centres to create an improvement action plan
- requiring staff members to receive further training
- placing temporary suspensions on certification of learners
- placing temporary suspensions on registration of learners
- debarring staff members or the centre from delivering Pearson qualifications
- suspending or withdrawing centre approval status.

The centre will be notified if any of these apply.

Pearson has established procedures for considering appeals against sanctions arising from malpractice. Appeals against a decision made by Pearson will normally be accepted only from the head of centre (on behalf of learners and/or members or staff) and from individual members (in respect of a decision taken against them personally). Further information on appeals can be found in the JCQ Appeals booklet in the *JCQ Appeals booklet* (www.jcq.org.uk/exams-office/appeals).

13 Understanding the qualification grade

This section explains the rules that we apply in providing an overall qualification grade for each learner. It shows how all the qualifications in this sector are graded. The final grade awarded for a qualification represents a holistic performance across all of the qualification. As the qualification grade is an aggregate of the total performance, there is some element of compensation in that a higher performance in some units will be balanced by a lower outcome in others.

In the event that a learner achieves more than the required number of optional units, the mandatory units along with the optional units with the highest grades will be used to calculate the overall result, subject to the eligibility requirements for that particular qualification title.

Awarding and reporting for the qualification

The awarding and certification of these qualifications will comply with the requirements of the Office of Qualifications and Examinations Regulation (Ofqual).

Eligibility for an award

To achieve any qualification grade learners must:

- achieve a Pass grade or higher in all units, and
- achieve the minimum number of points at a grade threshold.

It is the responsibility of the centre to ensure that a correct unit combination is adhered to.

Calculation of the qualification grade

The qualification grade is an aggregation of a learner's unit level performance. The Foundation Award, Award, Certificate, Diploma and Extended Diploma are awarded at the grade ranges shown in the table below.

Qualification	Available grade range
Foundation Award	P to D
Award	P to D
Certificate	P to D
Diploma	P to D
Extended Diploma	P to D

The *Calculation of Qualification Grade* table, shown further on in this section, shows the minimum thresholds for calculating these grades.

Learners who do not meet the minimum requirements for a qualification grade to be awarded will be recorded as Unclassified (U) and will not be certificated. They may receive a Notification of Performance for individual units. Our Information Manual (available on our website) gives more information.

Points available for internal units

The table below shows the number of points available for internal units. For each internal unit, points are allocated depending on the grade awarded.

	Unit size	Unit size	Unit size
	60 GLH	90 GLH	120 GLH
U	0	0	0
Pass	6	9	12
Merit	10	15	20
Distinction	16	24	32

Claiming the qualification grade

Subject to eligibility, Pearson will automatically calculate the qualification grade for your learners when the internal unit grades are submitted and the qualification claim is made. Learners will be awarded qualification grades for achieving the sufficient number of points within the ranges shown in the applicable Calculation of Qualification Grade table.

To allow for a weaker performance in some units to be balanced by a stronger performance in others, there is an element of compensation built into the grading model.

Points thresholds

Applicable for registration from 1 September 2016.

Foundation Award		Award		Certificate		Diploma		Extended Diploma	
180 GLH		360 GLH		540 GLH		720 GLH		1080 GLH	
Grade	Points threshold	Grade	Points threshold	Grade	Points threshold	Grade	Points threshold	Grade	Points threshold
U	0	U	0	U	0	U	0	U	0
P	18	P	36	P	54	P	72	P	108
M	26	M	52	M	78	M	104	M	156
D	37	D	74	D	108	D	144	D	216

Examples of grade calculations

Example 1: Achievement of a Diploma with a P grade

	GLH	Type (Int/Ext)	Grade	Unit points
Unit A	60	Int	Pass	6
Unit B	120	Int	Pass	12
Unit C	60	Int	Pass	6
Unit D	60	Int	Merit	10
Unit E	60	Int	Merit	10
Unit F	60	Int	Pass	6
Unit G	60	Int	Pass	6
Unit H	60	Int	Pass	6
Unit I	60	Int	Pass	6
Unit J	60	Int	Pass	6
Unit K	60	Int	Pass	6
Totals	**720**		**P**	**80**

The learner has exceeded the 72-point pass threshold and has passed all units.

Example 2: Achievement of a Diploma with a D grade

	GLH	Type (Int/Ext)	Grade	Unit points
Unit A	60	Int	Merit	10
Unit B	120	Int	Merit	26
Unit C	60	Int	Pass	6
Unit D	60	Int	Merit	10
Unit E	60	Int	Merit	10
Unit F	60	Int	Pass	6
Unit G	60	Int	Distinction	16
Unit H	60	Int	Distinction	16
Unit I	60	Int	Distinction	16
Unit J	60	Int	Distinction	16
Unit K	60	Int	Distinction	16
Totals	**720**		**D**	**148**

The learner has exceeded the 144 threshold for Distinction and has passed all units.

Example 3: An Unclassified result for a Diploma

	GLH	Type (Int/Ext)	Grade	Unit points
Unit A	60	Int	Merit	10
Unit B	120	Int	Pass	12
Unit C	60	Int	Pass	6
Unit D	60	Int	Merit	10
Unit E	60	Int	Merit	10
Unit F	60	Int	Pass	6
Unit G	60	Int	Pass	6
Unit H	60	Int	Merit	10
Unit I	60	Int	U	0
Unit J	60	Int	Merit	10
Unit K	60	Int	Merit	10
Totals	**720**		**U**	**90**

The learner has sufficient points for P (72) but has not passed all units. Hence, the grade is U.

Example 4: Extended Diploma Pass

	GLH	Type (Int/Ext)	Grade	Unit points
Unit A	60	Int	Pass	6
Unit B	120	Int	Pass	12
Unit C	60	Int	Pass	6
Unit D	60	Int	Pass	6
Unit E	60	Int	Pass	6
Unit F	60	Int	Merit	10
Unit G	60	Int	Merit	10
Unit H	60	Int	Distinction	16
Unit I	60	Int	Pass	6
Unit J	60	Int	Merit	10
Unit K	60	Int	Merit	10
Unit L	60	Int	Pass	6
Unit M	90	Int	Pass	9
Unit N	60	Int	Pass	6
Unit O	60	Int	Pass	6
Unit P	60	Int	Pass	6
Unit Q	60	Int	Pass	6
Totals	**1080**		**P**	**137**

The learner has exceeded the 108 point pass threshold, and has passed all units.

Example 5: Extended Diploma Distinction

	GLH	Type (Int/Ext)	Grade	Unit points
Unit A	60	Int	Distinction	16
Unit B	120	Int	Pass	12
Unit C	60	Int	Pass	6
Unit D	60	Int	Distinction	16
Unit E	60	Int	Distinction	16
Unit F	60	Int	Distinction	16
Unit G	60	Int	Distinction	16
Unit H	60	Int	Distinction	16
Unit I	60	Int	Pass	6
Unit J	60	Int	Pass	6
Unit K	60	Int	Distinction	16
Unit L	60	Int	Distinction	16
Unit M	60	Int	Distinction	16
Unit N	60	Int	Distinction	16
Unit O	60	Int	Distinction	16
Unit P	60	Int	Pass	6
Unit Q	60	Int	Merit	10
Totals	**1080**		**D**	**222**

The learner has exceeded the 216-point distinction threshold and has passed all units.

Example 6: An Unclassified result for an Extended Diploma

	GLH	Type (Int/Ext)	Grade	Unit points
Unit A	60	Int	Merit	10
Unit B	120	Ext	U	0
Unit C	60	Int	Pass	6
Unit D	60	Int	Pass	6
Unit E	60	Int	Pass	6
Unit F	60	Int	Merit	10
Unit G	60	Int	Merit	10
Unit H	60	Int	Pass	6
Unit I	60	Int	Pass	6
Unit J	60	Int	Merit	10
Unit K	60	Int	Merit	10
Unit L	60	Int	Pass	6
Unit M	60	Int	Pass	6
Unit N	60	Int	Pass	6
Unit O	60	Int	Pass	6
Unit P	60	Int	Pass	6
Unit Q	60	Int	Pass	6
Totals	**1080**		**U**	**116**

The learner has exceeded the 108 point pass threshold but has not passed all units.

14 Further information and publications

- Edexcel, BTEC and Pearson Work Based Learning contact details: qualifications.pearson.com/en/contact-us.html.
- Books, software and online resources for UK schools and colleges: www.pearsonschoolsandfecolleges.co.uk.
- Our publications catalogue lists all the material available to support our qualifications. To access the catalogue and order publications, please visit our website.

All centres offering external assessments must comply with the Joint Council for Qualifications (JCQ) document *Instructions for conducting examinations.*

Further documents that support the information in this specification:

- *Access arrangements and reasonable adjustments* (JCQ)
- *A guide to the special consideration process* (JCQ)
- *Collaborative and consortium arrangements for the delivery of vocational qualifications policy* (Pearson)
- *UK information manual* (updated annually and available in hard copy) **or** *Entries and information manual* (available online) (Pearson).
- *Distance learning and assessment policy* (Pearson)

Publisher information

Any publisher can seek endorsement for their resources and, if they are successful, we will list their BTEC resources on our website.

Annexe A: Assessment Strategy

Apprenticeship Standard for the Automotive Manufacturing Sector

Assessment Strategy for Employers, Training Providers and Awarding Organisations

Version 2

Section 1 – Occupational Competence Qualifications (Foundation and Development Phase)

Assessor requirements

Assessment must be carried out by competent assessors that, as a minimum, hold the QCF Level 3 Award in Assessing Competence in the Work Environment. Current and operational assessors that hold units D32 and/or D33 or A1 and/or A2 as appropriate to the assessment being carried out, will not be required to achieve the QCF Level 3 Award as they are still appropriate for the assessment requirements set out in this Assessment Strategy. However, they will be expected to regularly review their skills, knowledge and understanding and, where applicable, undertake continuing professional development to ensure that they are carrying out workplace assessment to the most up-to-date Employer Units of Competence.

Assessor technical requirements

Assessors must be able to demonstrate that they have verifiable, relevant and sufficient technical competence to evaluate and judge performance and knowledge evidence requirements as set out in the relevant outcomes in the Employer Units of Competence.

This will be demonstrated either by holding a relevant technical qualification or by proven industrial experience of the technical areas to be assessed. The assessor's competence must, at the very least, be at the same level as that required of the apprentice in the units being assessed.

Assessors must also be fully conversant with the awarding organisation's assessment recording documentation used for the Employer Units of Competence against which the assessments and verification are to be carried out, plus any other relevant documentation and systems and procedures to support the Quality Assurance (QA) process.

Verifier requirements (internal and external)

Internal quality assurance (internal verification) must be carried out by competent verifiers that, as a minimum, hold the QCF Level 4 Award in the Internal Quality Assurance of Assessment Processes and Practices. Current and operational internal verifiers that hold internal verification units V1 or D34 will not be required to achieve the QCF Level 4 Award as they are still appropriate for the verification requirements set out in this Assessment Strategy. Verifiers must be familiar with, and preferably hold, either the nationally recognised assessor units D32 and/or D33 or A1 and/or A2 or the QCF Level 3 Award in Assessing Competence in the Work Environment.

External quality assurance (external verification) must be carried out by competent external verifiers that, as a minimum, hold the QCF Level 4 Award in the External Quality Assurance of Assessment Processes and Practices.

Current and operational external verifiers that hold external verification units V2 or D35 will not be required to achieve the QCF Level 4 Award as they are still appropriate for the verification requirements set out in this Assessment Strategy. Verifiers must be familiar with, and preferably hold, either the nationally recognised assessor units D32 and/or D33 or A1 and/or A2 or the QCF Level 3 Award in Assessing Competence in the Work Environment.

External and internal verifiers will be expected to regularly review their skills, knowledge and understanding and where applicable undertake continuing professional development to ensure that they are carrying out workplace quality assurance (verification) of assessment processes and practices to the most up-to-date Employer Units of Competence.

Verifiers, both internal and external, will also be expected to be fully conversant with the terminology used in the Employer Units of Competence against which the assessments and verification are to be carried out, the appropriate regulatory body's systems and procedures and the relevant awarding organisation's documentation, systems and procedures within which the assessment and verification is taking place.

Specific technical requirements for internal and external verifiers

Internal and external verifiers for the Employer Units of Competence must be able to demonstrate verifiable, sufficient and relevant industrial experience, and must have a working knowledge of the processes, techniques and procedures that are used in the engineering industry.

The tables below and on the following page show the recommended levels of technical competence for assessors, internal verifiers, and external verifiers.

Technical requirements for assessors and verifiers

Position	Prime activity requirements	Support activity requirements	Technical requirements (see Notes section below)
Assessor	Assessment skills	IV systems	Technical *competence* in the areas covered by the Employer Units of Competence being assessed
Internal verifier	Verification skills	Assessment knowledge	Technical *understanding* of the areas covered by the Employer Units of Competence being verified
External verifier	Verification skills	Assessment understanding	Technical *awareness* of the areas covered by the Employer Units Competence being verified

Notes

1. Technical competence is defined here as a combination of practical skills, knowledge, and the ability to apply both of these, in familiar and new situations, within a real working environment.
2. Technical understanding is defined here as having a good understanding of the technical activities being assessed, together with knowledge of relevant health and safety implications and requirements of the assessments.
3. Technical awareness is defined here as a general overview of the subject area, sufficient to ensure that assessment and evidence are reliable, and that relevant health and safety requirements have been complied with.
4. The competence required by the assessor, internal verifier and external verifier, in the occupational area being assessed, is likely to exist at three levels as indicated by the shaded zones in the following table.

Technical Competence / Required by:	An ability to *discuss* the general principles of the competences being assessed	An ability to *describe* the practical aspects of the competence being assessed	An ability to *demonstrate* the practical competences being assessed
Assessor			
Internal verifier			
External verifier			

Assessment environment of the Employer Units of Competence in the foundation phase of the Apprenticeship

The Employer Units of Competence are intended to have a wide application throughout the automotive manufacturing sector. It is therefore necessary to have a flexible approach to the environment in which the Employer Units of Competence are delivered and assessed during the foundation phase of the Apprenticeship.

There is much to be gained by acquiring the basic engineering competencies required in the foundation phase of the Apprenticeship while working in a sheltered but realistic environment such as in a training centre or college. This is due to an ongoing emphasis on safety critical work activities and the need to ensure flexibility of assessment opportunities to both maintain and enhance the provision of competent personnel within the automotive manufacturing sector. This assessment method will allow a minimum safe level of skills, knowledge and understanding to be achieved and demonstrated by the apprentice before being exposed to the hazards of the industrial environment, therefore minimising the risk of injury to themselves and other employees.

For the above reasons, the assessment of the apprentice's competence in a sheltered but realistic environment is acceptable for the Employer Units of Competence included in the Foundation Stage of the Apprenticeship, where the environment replicates that expected in industry.

Where applicable, the machinery, tools, materials, equipment and resources used must be representative of industry standards and there must be sufficient equipment/resources available for each apprentice to demonstrate their competence on an individual basis. Workpieces or work outcomes assessed must be the apprentice's own work and should be actual work examples that combine the skills and techniques required by the Employer Units of Competence so that achievement will properly reflect the apprentice's capabilities.

Assessors must ensure that the competency is fully transferable to the workplace. Other aspects that should be considered include:

- environmental conditions, such as lighting conditions, noise levels and the presence of hazards
- pressure of work, such as time constraints and repetitive activities
- producing actual workpieces or work outcomes, and the consequence of making mistakes and the effect this has on customer, supplier and departmental relationships.

Assessment environment of the Employer Units of Competence in the development phase of the Apprenticeship

The evidence put forward for the Employer Units of Competence can only be regarded valid, reliable, sufficient and authentic if achieved and obtained in the working environment, where the apprentice is employed and be clearly attributable to the apprentice. However, in certain circumstances, simulation/replication of work activities may be acceptable, but must be kept to an absolute minimum.

The use of high-quality, realistic simulations/replication, which impose pressures consistent with workplace expectations, should only be used in relation to the assessment of the following:

- rare or dangerous occurrences, such as those associated with health, safety and the environment issues, emergency scenarios and rare operations at work
- the response to faults and problems for which no opportunity has presented for the use of naturally occurring workplace evidence of learners' competence
- aspects of working relationships and communications for which no opportunity has presented for the use of naturally occurring workplace evidence of learners' competence

Simulations/replications will require prior approval from the specific awarding organisation and should be designed in relation to the following parameters:

- the environment in which simulations take place must be designed to match the characteristics of the working environment

Competencies achieved via simulation/replication must be transferable to the working environment:

- simulations that are designed to assess competence in dealing with emergencies, accidents and incidents must be verified as complying with relevant health, safety and environmental legislation by a competent health and safety/environmental control officer before being used

- simulated activities should place apprentices under the same pressures of time, access to resources and access to information as would be expected if the activity was real
- simulated activities should require apprentices to demonstrate their competence using plant and/or equipment used in the working environment
- simulated activities that require interaction with colleagues and contacts should require the apprentice to use the communication media that would be expected at the workplace
- for health and safety reasons simulations need not involve the use of genuine substances/materials. Any simulations which require the apprentice to handle or otherwise deal with materials substances/should ensure that the substitute takes the same form as in the workplace.

Access to assessment

There are no entry requirements required for the Employer Units of Competence unless this is a legal requirement of the process or the environment in which the apprentice is working in. Assessment is open to any apprentice who has the potential to reach the assessment requirements set out in the relevant units.

Aids or appliances that allow students with special educational needs, disabilities or temporary injuries, may be used during assessment, providing they do not compromise the standard required.

Carrying out assessments of the occupational competence qualifications

The Employer Units of Competence have been specifically developed to cover a wide range of activities. The evidence produced for the units will, therefore, depend on the skills and knowledge required by employers and specified in the Apprentices Training Plan.

The *Skills* section of the Employer Units of Competence makes reference to a number of optional items in the units (for example 'any three from five'). This is the minimum standard set by employers.

Where the unit requirements give a choice of optional items, assessors should note that apprentices do not need to provide evidence of the other items to complete the unit (in the example above, three items from five), unless specified by the employer.

Performance evidence requirements of the occupational competence qualifications

Performance evidence must be the main form of evidence gathered.

For the Mechatronics Maintenance Technician and Product Design and Development Technician Apprenticeship Standards, in order to demonstrate consistent competent performance for a unit, a minimum of **two** different examples of performance of the unit activity will be required in the foundation phase plus the successful achievement of the gateway assessment.

For the development phase a minimum of **three** different examples of performance of the unit activity will be required (there will be no gateway assessment at the end of the development phase). Items of performance evidence often contain features that apply to more than one unit, and **can be used as evidence in any unit** where they are suitable:

- products of the learner's work, such as items that have been produced or worked on, plans, charts, reports, standard operating procedures, documents produced as part of a work activity, records or photographs of the completed activity

together with:

- evidence of the way the apprentice carried out the activities, such as witness testimonies, assessor observations or authenticated apprentice reports of the activity undertaken.

Competent performance is more than just carrying out a series of individual set tasks. Many of the units in the foundation phase contain statements that require the apprentice to provide evidence that proves they are capable of combining various features and techniques. Where this is the case, separate fragments of evidence would not provide this combination of features and techniques and, therefore, will not be acceptable as demonstrating competent performance.

If there is any doubt as to what constitutes suitable evidence, the internal/external verifier should be consulted.

Foundation Unit: Maintaining Mechanical Devices and Equipment
Unit-specific additional assessment requirements: Specific unit requirements

In order to prove their ability to combine different maintenance operations, at least one of the maintenance activities must be of a significant nature, and must cover at least **seven** of the activities listed in paragraph 4 plus the removal and replacement/refitting of a minimum of **five** of the components listed in paragraph 5 in the *Skills* Section.

It is a requirement that training providers and assessors develop a written training plan and/or scheme of work that outlines the number of training activities and interventions throughout each planned session. The plan should also outline when assessment is planned to take place, which should be after a number of training activities on the topic have taken place over a sustained period. Competency assessments should not start until the relevant training has been given and the providers/assessors are confident the learner can achieve the assessment requirements.

Assessing knowledge and understanding requirements in the occupational competence qualifications

Knowledge and understanding are key components of competent performance, but it is unlikely that performance evidence alone will provide enough evidence in this area. Where the apprentice's knowledge and understanding is not apparent from performance evidence, it must be assessed by other means and be supported by suitable evidence.

Knowledge and understanding can be demonstrated in a number of different ways. It is recommended that oral questioning and practical demonstrations are used perhaps while observing the apprentice undertake specific tasks, as these are considered the most appropriate for these units. Assessors should ask enough questions to make sure that the apprentice has an appropriate level of knowledge and understanding, as required by the unit.

Evidence of knowledge and understanding will not be required for those items in the *Skills* section of the Employer Units of Competence that have not been selected by the employer.

The achievement of the specific knowledge and understanding requirements in the units may not simply be inferred by the results of tests, exams or assignments from other units such as in the technical knowledge qualifications or other training programmes. Where evidence is submitted from these sources, the assessor must, as with any assessment, make sure the evidence is valid, reliable, authentic, directly attributable to the apprentice, and meets the full knowledge and understanding requirements of the unit. Awarding organisations should be able to provide advice and guidance where evidence from technical knowledge qualification tests and/or assignments can be mapped and used to meet the requirements of the occupational competence unit requirements.

Where oral questioning is used, the assessor must retain a record of the questions asked, together with the apprentice's answers.

Witness testimony

Where observation is used to obtain performance evidence, this must be carried out against the unit assessment criteria. Best practice would require that such observation is carried out by a qualified assessor. If this is not practicable, then alternative sources of evidence may be used.

For example, the observation may be carried out against the assessment criteria y someone else that is in close contact with the apprentice. This could be a team leader, supervisor, mentor or line manager who may be regarded as a suitable witness to the apprentice's competency. However, the witness must be technically competent in the process or skills that they are providing testimony for, to at least the same level of expertise as that required of the apprentice. It will be the responsibility of the assessor to make sure that any witness testimonies accepted as evidence of the apprentice's competency are reliable, auditable and technically valid.

Maximising opportunities to use assessment evidence

One of the critical factors required in order to make this assessment strategy as efficient and effective as possible and to ease the burden of assessment, is the assessor's ability and expertise to work in partnership with the apprentice and their employer to provide advice and guidance on how to maximise opportunities to cross-reference performance and knowledge evidence to all relevant Employer Units of Competence. For example, if a knowledge statement is repeated in a number of separate Employer Units of Competence and the expected evidence/response to that statement is the same, including the context, then the same piece of evidence should be cross-referenced to the appropriate units. As stated above, evidence from technical knowledge qualification test and assignments etc. should be used where this is valid, reliable and can be attributed to the individual apprentice.

Section 2 – General requirements

Continuing Professional Development (CPD)

Centres must support their staff to ensure that they have current technical knowledge of the occupational area; that delivery, mentoring, training, assessment and verification are in line with best practice, technical advancements and that they will take account of any national or legislative developments.

There must be an auditable individual CPD plan in place for all staff assessing and verifying the qualifications within the relevant foundation and development phases, the plan must meet the relevant provider and automotive manufacturing employer requirements.

Assessors/teachers/trainers/lecturers (as applicable):

- must understand the Engineering Technician (EngTech) (UK specification) requirements when providing guidance to assessors. They will be required to provide a signed declaration confirming they have read and understood the EngTech specification and the evidence requirements to meet the EngTech criteria (currently in development). The EngTech specification can be found at www.engc.org.uk
- must understand the requirements of the relevant Apprenticeship Standards – End of Scheme Assessment Recording Document (currently in development)
- must understand the requirements of the relevant Apprenticeship Standards – Behavioral Framework and the review and assessment recording documentation (currently in development).

Quality control of assessment

General

There are two major points where an awarding organisation interacts with the centre in relation to the external quality control of assessment and these are:

- approval – when a centre takes on new qualifications/units, the awarding organisation, normally through an external verifier (EV) ensures that the centre is suitably equipped and prepared to deliver the new units/qualification
- monitoring – throughout the ongoing delivery of the qualification/units the awarding organisation, through EV monitoring and other mechanisms must maintain the quality and consistency of assessment of the units/qualification.

Approval

In granting approval, the awarding organisation, normally through its external verifier (EV) must ensure that the prospective centre:

- meets the requirements of the qualification regulator
- has sufficient and appropriate physical and staff resources
- meets relevant health and safety and/or equality and access requirements
- has a robust plan for the delivery of the qualification/units.

The awarding organisation may visit the centre to view evidence or may undertake this via other means.

Monitoring

The awarding organisation, through EV monitoring and other mechanisms, must ensure:

- that a strategy is developed and deployed for the ongoing awarding organisation monitoring of the centre. This strategy must be based on an active risk assessment of the centre. In particular, the strategy must identify the apprentice, assessors and internal verifier sampling strategy to be deployed and the rationale behind this
- that the centre's internal QA processes are effective in assessment
- that sanctions are applied to a centre where necessary and that corrective actions are taken by the centre and monitored by the awarding organisation(AO)/EV
- that reviews of the AO's external auditing arrangements are undertaken.

Notes

a) It is recognised that each AO will have its own guidance and procedure on the internal and external quality assurance process applied to these qualifications. See individual AO websites for further information.

b) This assessment strategy is a 'work in progress' and will be amended and re-issued as the competence and technical knowledge qualifications and assessment methodologies are developed and modified.

The automotive manufacturing sector is mindful that its apprenticeships are and **must** be available across all four Nations in the UK where applicable. The sector has ensured that the Employer Occupational Brief (EOB) and the associated Employer Units of Competence are directly aligned to the existing format and content of the sector's National Occupational Standards (NOS)

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