



Level 3 NVQ Extended Diploma in Engineering Maintenance ENGINEERING

Qualification Specification

Overview

This qualification has been developed to enable learners to demonstrate competence in their engineering maintenance occupation.

Typical Job

The qualification is applicable to a wide variety of engineering maintenance occupations within the sector, dependent on the pathway chosen.

Qualification code:	600/2084/2
Level:	3
Total qualification time:	1790
Guided learning hours:	426 (min) 947 (max)
Credits:	179
Minimum age:	16

Issue 2.0



Purpose of the qualification

This qualification enables learners to demonstrate their occupational competence in an engineering maintenance activity relevant to their job role. It is principally for engineering apprentices working within the sector. The qualification requires occupational evidence from the workplace.

What could this qualification lead to?

A career in the engineering sector, further or higher study such as project management, supervision, and business improvement techniques.

Entry Requirements

Learners must have the potential to achieve the assessment criteria set out in the units

How is the qualification achieved?

The learner must present evidence (portfolio) which clearly shows they have met the assessment criteria and learning outcomes. The learner must achieve the mandatory and optional units relevant to their pathway (occupational role).

What will be assessed?

All evidence submitted by the learner against the assessment criteria.

How will it be assessed?

Evidence for this qualification will be assessed in accordance with the SEMTA engineering assessment strategy, which has been created from engagement with stakeholders (employers etc.) in the engineering sector.

The qualification is not graded and only a pass can be achieved – which indicates the learner's occupational competence.

Structure of the EAL Level 3 NVQ Extended Diploma

The Extended Diploma is comprised of a Level 3 Engineering Qualification **extended** by inclusion of technically specific PEO Units as follows:-

Mandatory Units – A combination of Level 2 & 3

Group A – Level 2 PEO Units x 3 (Engineering Practices pathway)

OR

Group B – Level 2 PEO Units x 5 (Technical Support pathway)

And

Group C - Engineering Pathway – Level 3 optional Units

Delivery requirements

In the context of the Apprenticeship Framework, the technically specific level 2 PEO units **must** be delivered and assessed in a sheltered work environment **before** starting delivery and assessment of the level 3 components in the working environment.

PEO:

To support these basic engineering skills and techniques, the learner must be trained in, and continuously practice the relevant Health and Safety, engineering communication requirements along with all the other Mandatory Unit(s) listed within that qualification. The Learner cannot be signed off as being competent for these units in this period.

Level 3:

On completion of the PEO2 Units, the Learner moves on to the Units from the Level 3 qualification which can only be assessed within a workplace environment.

EAL Level 3 NVQ Extended Diploma in Engineering Maintenance

This qualification will be achieved when the learner has successfully completed the common mandatory Assessment route followed by the required number of optional Assessment routes.

Mandatory assessment routes: All four assessment routes must be completed

EAL code	Assessment route title	Level	Credit value	Guided learning hours	Ofqual code
QENM2/001	Complying with Statutory Regulations and Organisational Safety Requirements	2	5	35	A/601/5013
QENM2/002	Using and Interpreting Engineering Data and Documentation	2	5	25	Y/601/5102
QENM3/003	Working Efficiently and Effectively in Engineering	3	5	25	K/601/5055
QENM3/004	Handing Over and Confirming Completion of Maintenance or Installation Activities	3	20	35	T/600/5516

Group A (Engineering practices)

Optional Units: Learners must complete **three** more units from the following

Notes:

Only one unit from **4, 32** and **61** may be included in the learner's choice of three units.

If unit **65** is selected units **5, 6, 8, 11, 12, 15, 16, 17** cannot be included in the learner's choice of three units.

If unit **66** is selected units **10, 22, 23, 25, 26, 27, 28, 29, 30, 34** cannot be included in the learner's choice of three units.

If unit **67** is selected units **33, 35, 36, 40** cannot be included in the learner's choice of three units.

If unit **68** is selected units **19, 21, 37, 38, 39, 40, 58, 59** cannot be included in the learner's choice of three units

QPEO2/004N	Producing Mechanical Engineering Drawings using a CAD System	2	11	61	F/504/6348
QPEO2/005N	Producing Components using Hand Fitting Techniques	2	14	64	J/504/6349
QPEO2/006N	Producing Mechanical Assemblies	2	15	68	F/504/6351
QPEO2/007N	Forming and Assembling Pipework Systems	2	14	64	L/504/6353
QPEO2/008N	Carrying Out Aircraft Detail Fitting Activities	2	14	64	R/504/6354
QPEO2/009N	Installing Aircraft Mechanical Fasteners	2	11	61	L/504/6367
QPEO2/010N	Producing Aircraft Detail Assemblies	2	14	65	L/504/6370
QPEO2/011N	Preparing and Using Lathes for Turning Operations	2	15	68	Y/504/6372
QPEO2/012N	Preparing and Using Milling Machines	2	15	68	K/504/6375
QPEO2/013N	Preparing and Using Grinding Machines	2	15	68	T/504/6377
QPEO2/014N	Preparing and Proving CNC Machine Tool Programs	2	14	64	F/504/6379
QPEO2/015N	Preparing and Using CNC Turning Machines	2	14	64	F/504/6382
QPEO2/016N	Preparing and Using CNC Milling Machines	2	14	64	L/504/6384

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QPEO2/017N	Preparing and Using CNC Machining Centres	2	14	64	D/504/6387
QPEO2/018N	Preparing and Using Industrial Robots	2	14	64	D/504/6390
QPEO2/019N	Maintaining Mechanical Devices and Equipment	2	14	64	T/504/6394
QPEO2/020N	Assembling and Testing Fluid Power Systems	2	14	64	J/504/6397
QPEO2/021N	Maintaining Fluid Power Equipment	2	14	64	F/504/6401
QPEO2/022N	Producing Sheet Metal Components and Assemblies	2	14	64	J/504/6402
QPEO2/023N	Producing Plateway Components and Assemblies	2	14	64	L/504/6403
QPEO2/024N	Cutting and Shaping Materials using Thermal Cutting Equipment	2	14	64	R/504/6404
QPEO2/025N	Preparing and Proving CNC Fabrication Machine Tool Programs	2	14	64	Y/504/6405
QPEO2/026N	Preparing and Using CNC Fabrication Machinery	2	14	64	D/504/6406
QPEO2/027N	Preparing and Using Manual Metal Arc Welding Equipment	2	15	68	K/504/6408
QPEO2/028N	Preparing and Using Manual TIG or Plasma-arc Welding Equipment	2	15	68	M/504/6409
QPEO2/029N	Preparing and Using Semi-automatic MIG, MAG and Flux cored arc Welding equipment	2	15	68	H/504/6410
QPEO2/030N	Preparing and Using Manual Oxy/fuel Gas Welding Equipment	2	14	64	Y/504/6419
QPEO2/031N	Preparing and Using Manual Flame Brazing and Braze Welding Equipment	2	11	61	L/504/6420
QPEO2/032N	Producing Electrical or Electronic Engineering Drawings using a CAD System	2	11	61	R/504/6421
QPEO2/033N	Wiring and Testing Electrical Equipment and Circuits	2	14	64	Y/504/6422
QPEO2/034N	Forming and Assembling Electrical Cable Enclosure and Support Systems	2	13	65	D/504/6423
QPEO2/035N	Assembling, Wiring and Testing Electrical Panels/Components Mounted in	2	14	64	H/504/6424

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QPEO2/036N	Assembling and Testing Electronic Circuits	2	14	64	K/504/6425
QPEO2/037N	Maintaining Electrical Equipment/Systems	2	15	68	M/504/6426
QPEO2/038N	Maintaining Electronic Equipment/Systems	2	15	68	T/504/6427
QPEO2/039N	Maintaining and Testing Process Instrumentation and Control Devices	2	15	68	A/504/6428
QPEO2/040N	Wiring and Testing Programmable Controller Based Systems	2	15	68	F/504/6429
QPEO2/041N	Using Wood for Pattern, Modelmaking and Other Engineering Applications	2	15	68	T/504/6430
QPEO2/042N	Assembling Pattern, Model and Engineering Woodwork Components	2	14	64	A/504/6431
QPEO2/043N	Producing Composite Mouldings using Wet Lay-up Techniques	2	14	64	F/504/6432
QPEO2/044N	Producing Composite Mouldings using Pre-Preg Laminating Techniques	2	14	64	L/504/6434
QPEO2/045N	Producing Composite Mouldings using Resin Flow Infusion Techniques	2	14	64	R/504/6435
QPEO2/046N	Producing Composite Assemblies	2	14	64	Y/504/6436
QPEO2/047N	Producing Components by Rapid Prototyping Techniques	2	11	61	D/504/6437
QPEO2/048N	Producing and Preparing Sand Moulds and Cores for Casting	2	14	64	H/504/6438
QPEO2/049N	Producing and Preparing Molten Materials for Casting	2	14	64	K/504/6439
QPEO2/050N	Producing Cast Components by Manual Means	2	13	65	D/504/6440
QPEO2/051N	Fettling, Finishing and Checking Cast Components	2	11	61	H/504/6441
QPEO2/052N	Finishing Surfaces by Applying Coatings or Coverings	2	9	41	M/504/6443
QPEO2/053N	Finishing Surfaces by Applying Treatments	2	9	41	T/504/6444
QPEO2/054N	Carrying Out Heat Treatment of Engineering Materials	2	9	41	A/504/6445

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QPEO2/055N	Carrying Out Hand Forging of Engineering Materials	2	9	41	F/504/6446
QPEO2/056N	Stripping and Rebuilding Motorsport Vehicles (Pre-Competition)	2	14	64	J/504/6447
QPEO2/057N	Inspecting a Motorsport Vehicle During Competition	2	14	64	L/504/6448
QPEO2/058N	Diagnosing and Rectifying Faults on Motorsport Vehicle Systems (During a Competition)	2	15	68	R/504/6449
QPEO2/059N	Carrying Out Maintenance Activities on Motor Vehicle Electrical Equipment	2	15	68	J/504/6450
QPEO2/060N	Stripping and Rebuilding Motorsport Engines (Pre – Competition)	2	14	64	L/504/6451
QPEO2/061N	Producing CAD Models (Drawings) using a CAD System	2	11	61	R/504/6452
QPEO2/065N	General Machining, Fitting and Assembly Applications	2	12	55	K/504/6456
QPEO2/066N	General Fabrication and Welding Applications	2	12	55	M/504/6457
QPEO2/067N	General Electrical and Electronic Engineering Applications	2	12	55	T/504/6458
QPEO2/068N	General Maintenance Engineering Applications	2	12	55	A/504/6459
QPEO2/069N	Joining Public Service Vehicle Components by Mechanical Processes	2	11	61	L/503/4056
QPEO2/070N	Assembling Structural Sub Assemblies to Produce a Public Service Vehicle	2	14	64	R/503/4057
QPEO2/071N	Fitting Sub Assemblies and Components to Public Service Vehicles	2	14	64	Y/503/4058
QPEO2/072N	Preparing and Manoeuvring Armoured Fighting Vehicles AFVs for Maintenance and Transportation	2	14	64	R/503/7198
QPEO2/073N	Producing Composite Mouldings using Resin Film Infusion Techniques	2	14	64	J/504/3404

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Or

Group B (Technical Support):

Learners must complete one of the following PEO Level 2 assessment routes:

QPEO2/004N	Producing Mechanical Engineering Drawings using a CAD System	2	11	61	F/504/6348
QPEO2/032N	Producing Electrical or Electronic Engineering Drawings using a CAD System	2	11	61	R/504/6421
QPEO2/061N	Producing CAD Models (Drawings) using a CAD System	2	11	61	R/504/6452

Plus two from the following PEO Level 2 assessment routes:

QPEO2/062N	Producing Engineering Project Plans	2	8	37	Y/504/6453
QPEO2/063N	Using Computer Software Packages to Assist with Engineering Activities	2	8	37	D/504/6454
QPEO2/064N	Conducting Business Improvement Activities	2	8	41	H/504/6455

Plus two more from the following PEO Level 2 assessment routes:

QPEO2/065N	General Machining, Fitting and Assembly Applications	2	12	55	K/504/6456
QPEO2/066N	General Fabrication and Welding Applications	2	12	55	M/504/6457
QPEO2/067N	General Electrical and Electronic Engineering Applications	2	12	55	T/504/6458
QPEO2/068N	General Maintenance Engineering Applications	2	12	55	A/504/6459

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In addition to the PEO Level 2 unit requirement in Group A or B, learners must complete the unit requirements for one of the following Level 3 Engineering Maintenance Pathways

Group C

Pathway EMA: Mechanical

Optional assessment routes: Both of the following assessment routes must be taken:

QENM3/005	Carrying Out Fault Diagnosis on Mechanical Equipment	3	50	60	T/600/5533
QENM3/006	Maintaining Mechanical Equipment	3	70	119	H/600/5544

Plus two assessment routes from the following:

QENM3/007	Restoring Mechanical Components to Usable Condition by Repair	3	47	91	A/600/5551
QENM3/008	Producing Replacement Components for Maintenance Activities	3	47	91	H/600/5558
QENM3/009	Carrying Out Preventative Planned Maintenance on Mechanical Equipment	3	38	74	A/600/5565
QENM3/010	Carrying Out Condition Monitoring of Plant and Equipment	3	39	81	A/600/5582
QENM3/080	Assisting in the Installation of Mechanical Equipment	3	49	161	J/600/5634

Pathway EMB: Electrical

Optional assessment routes: All of the following assessment routes must be taken:

QENM3/011	Carrying Out Fault Diagnosis on Electrical Equipment and Circuits	3	50	60	H/600/5592
QENM3/012	Maintaining Electrical Equipment	3	70	119	Y/600/5606
QENM3/013	Modifying or Rewiring Electrical Circuits	3	35	63	D/600/5610

Plus two assessment routes from the following:

QENM3/014	Testing Electrical Equipment and Circuits	3	50	60	H/600/5656
QENM3/015	Carrying Out Preventative Planned Maintenance on Electrical Equipment	3	38	74	F/600/5664
QENM3/010	Carrying Out Condition Monitoring of Plant and Equipment	3	39	81	A/600/5582
QENM3/081	Assisting in the Installation of Electrical/Electronic Equipment	3	48	161	H/600/5642

Pathway EMC: Electronic

Optional assessment routes: All of the following assessment routes must be taken:

QENM3/016	Carrying Out Fault Diagnosis on Electronic Equipment and Circuits	3	50	60	Y/600/5671
QENM3/017	Testing Electronic Equipment and Circuits	3	50	60	A/600/5677
QENM3/018	Repairing Electronic Equipment	3	62	81	D/600/5946

Pathway EMD: Fluid Power

Optional assessment routes: Both of the following assessment routes must be taken:

QENM3/019	Carrying Out Fault Diagnosis on Fluid Power Equipment and Circuits	3	50	60	T/600/5953
QENM3/020	Maintaining Fluid Power Equipment	3	70	119	M/600/5983

Plus two assessment routes from the following:

QENM3/021	Carrying Out Preventative Planned Maintenance on Fluid Power Equipment	3	38	74	J/600/5990
QENM3/010	Carrying Out Condition Monitoring of Plant and Equipment	3	39	81	A/600/5582
QENM3/022	Testing Fluid Power Equipment and Systems	3	46	56	D/600/6000
QENM3/082	Assisting in the Installation of	3	48	161	L/600/5649

Pathway EME: Engineered Systems

Optional assessment route: The following assessment route must be taken:

QENM3/023	Carrying Out Fault Diagnosis on Engineered Systems	3	53	95	L/600/6011
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Plus two assessment routes from the following:

QENM3/024	Maintaining Mechanical Equipment within an Engineered System	3	81	161	Y/600/5413
QENM3/025	Maintaining Electrical Equipment within an Engineered System	3	81	161	M/600/5417
QENM3/026	Maintaining Fluid Power Equipment within an Engineered System	3	81	161	A/600/5422
QENM3/027	Maintaining Process Controller Equipment within an Engineered System	3	81	161	Y/600/5427

Plus one assessment route from the following:

QENM3/028	Carrying Out Preventative Planned Maintenance on Engineered Systems	3	38	74	F/600/5440
QENM3/010	Carrying Out Condition Monitoring of Plant and Equipment	3	39	81	A/600/5582
QENM3/083	Assisting in the Installation of Equipment to Produce an Engineered System	3	48	161	T/600/5659

Pathway EMF: Services Maintenance

Optional assessment routes: Both of the following assessment routes must be taken:

QENM3/029	Reading and Extracting Information from Service Drawings and Specifications	3	5	25	J/600/5469
QENM3/030	Carrying Out Fault Diagnosis on Services and Systems	3	50	60	R/600/5474

Plus two assessment routes from the following:

QENM3/031	Maintaining Fresh Water Distribution Systems and Equipment	3	70	119	K/600/5481
QENM3/032	Maintaining Waste/Foul Water Distribution Systems and Equipment	3	70	119	H/600/5494
QENM3/033	Maintaining Workplace Environmental Control Systems	3	70	119	T/600/5497
QENM3/034	Maintaining Emergency Power Generation Equipment	3	70	119	T/600/5502
QENM3/035	Maintaining Heating and Ventilation Systems	3	70	119	L/600/5506
QENM3/036	Maintaining Air Conditioning and Ventilation Systems	3	70	119	H/600/5513
QENM3/037	Maintaining Gas Distribution Systems and Equipment	3	70	119	J/600/5519
QENM3/038	Maintaining Compressed Air Systems and Equipment	3	70	119	Y/600/5525
QENM3/039	Maintaining Process Control Systems	3	70	119	H/600/5530
QENM3/040	Maintaining Instrumentation and Control Systems	3	70	119	J/600/5536
QENM3/041	Maintaining Industrial Refrigeration Equipment	3	70	119	L/600/5540
QENM3/042	Maintaining Environmental Control Equipment	3	70	119	M/600/5546
QENM3/072	Maintaining Medical Device and Surgical Instrument Decontamination Equipment	3	70	119	K/600/5609
QENM3/073	Maintaining Medical Gas Pipeline Systems and Equipment	3	70	119	J/600/5617

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Pathway EMF: Services Maintenance (cont)

Plus one assessment route from the following:

QENM3/043	Carrying Out Preventative Planned Maintenance on Services Systems and Equipment	3	38	74	F/600/5552
QENM3/010	Carrying Out Condition Monitoring of Plant and Equipment	3	39	81	A/600/5582
QENM3/084	Assisting in the Installation of Engineering Services Equipment	3	48	161	R/600/5667

Pathway EMG: Lift Servicing

Optional assessment routes: All of the following assessment routes must be taken:

QENM3/044	Carrying Out Fault Diagnosis on Lifts	3	50	60	T/601/2224
QENM3/045	Inspecting and Servicing Lift Equipment	3	38	74	K/600/5495
QENM3/046	Checking Lift Function	3	50	60	R/600/5507
QENM3/047	Rectifying Faults in Lifts	3	47	91	A/600/5520

Pathway EMH: Lift Repair

Optional assessment routes: All of the following assessment routes must be taken:

QENM3/044	Carrying Out Fault Diagnosis on Lifts	3	50	60	T/601/2224
QENM3/046	Checking Lift function	3	50	60	R/600/5507
QENM3/047	Rectifying Faults in Lifts	3	47	91	A/600/5520
QENM3/048	Repairing/Replacing Lift Doors, Chains, Ropes and Equipment	3	47	91	A/600/5534

Pathway EMI: Escalator Repair and Service

Optional assessment routes: All of the following assessment routes must be taken:

QENM3/049	Carrying Out Fault Diagnosis on Escalators	3	50	60	R/600/5541
QENM3/050	Rectifying Faults in Escalators	3	47	91	R/600/5555
QENM3/051	Inspecting and Servicing Escalators	3	38	74	R/600/5457
QENM3/052	Testing and Reinstating Escalator Installations	3	46	56	T/600/5564

Pathway EMJ: Communication Electronics

Optional assessment routes: One of the following assessment routes must be taken:

QENM3/016	Carrying Out Fault Diagnosis on Electronic Equipment and Circuits	3	50	60	Y/600/5671
QENM3/053	Carrying Out Fault Diagnosis on Communication Electronic Systems	3	50	60	Y/600/5573

Plus two assessment routes from the following:

QENM3/017	Testing Electronic Equipment and Circuits	3	50	60	A/600/5677
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OR (but not both):

QENM3/054	Testing Communication-Electronic Systems	3	50	60	A/600/5579
QENM3/018	Repairing Electronic Equipment	3	62	81	D/600/5946

OR (but not both):

QENM3/055	Repairing Communication-Electronic Systems	3	62	81	M/600/5465
QENM3/056	Carrying Out Preventative Planned Maintenance on Communication	3	38	74	D/600/5476
QENM3/057	Modifying Communication	3	35	63	L/600/5585
QENM3/058	Configuring Communication	3	51	77	Y/600/5590
QENM3/059	Installing Communication	3	32	81	J/600/5598

Pathway EMK: Servicing Medical Equipment

Optional assessment routes: All of the following assessment routes must be taken:

QENM3/060	Carrying Out Fault Diagnosis on Medical Equipment	3	50	60	A/600/5601
QENM3/061	Testing Medical Equipment	3	50	60	H/600/5608
QENM3/062	Carrying Out Scheduled Servicing on Medical Equipment	3	38	74	A/600/5484

Plus three assessment routes from the following:

QENM3/063	Servicing Cardiovascular Equipment	3	70	119	R/600/5491
QENM3/064	Servicing Physiological Monitoring and Infusion Equipment	3	70	119	F/600/5499
QENM3/065	Servicing Anaesthetic and Ventilation Equipment	3	70	119	Y/600/5508
QENM3/066	Servicing Operating Theatre and Surgical Equipment	3	70	119	F/600/5518
QENM3/067	Servicing Medical Imaging Equipment	3	70	119	T/600/5581
QENM3/068	Servicing Laboratory Equipment	3	70	119	R/600/5586
QENM3/069	Servicing Dental Equipment	3	70	119	D/600/5591
QENM3/070	Servicing Medical Therapeutic Equipment	3	70	119	F/600/5597
QENM3/071	Servicing Mechanical and Electromechanical Assistive Technology Equipment	3	70	119	F/600/5602
QENM3/086	Servicing radiotherapy equipment	3	70	119	M/506/6272
QENM3/087	Servicing on clinical computing equipment	3	70	119	K/506/6271

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Pathway EML: Instrumentation and Control

Optional assessment routes: Both of the following assessment routes must be taken:

QENM3/074	Carrying Out Fault Diagnosis on Instrumentation and Control Equipment and Circuits	3	50	60	Y/600/5637
QENM3/075	Maintaining Instrumentation and Control Equipment and Circuits	3	70	119	L/600/5621

Plus two assessment routes from the following:

QENM3/076	Carrying Out Preventative Planned Maintenance on Instrumentation and Control Equipment	3	38	74	T/600/5628
QENM3/077	Repairing/Overhauling Instrumentation and Control Equipment	3	47	91	M/600/5644
QENM3/078	Testing and Calibrating Instrumentation and Control Equipment and Circuits	3	50	60	J/600/5651
QENM3/085	Assisting in the Installation of Instrumentation and Control Equipment	3	48	161	F/600/6068