National Certificate in Motor Industry (Automotive Electrical Engineering)

Level **4**

Credits **244**

This qualification has been **reviewed**. The last date to meet the requirements is 31 December 2020.

Version 6 of this qualification has been republished to extend the last date for assessment from 31 December 2016 to 31 December 2020 and to set a last date for entry as 31 December 2016.

Transition Arrangements

This qualification, the National Certificate in Motor Industry (Motorcycle Engineering) [Ref: 0015], National Certificate in Motor Industry (Automotive Engineering) [Ref: 0019], National Certificate in Motor Industry (Outdoor Power Equipment Servicing) [Ref: 0697], National Certificate in Motor Industry (Trailer Boat Systems Engineering) (Level 3) [Ref: 0698], and the National Certificate in Motor Industry (Trailer Boat Systems Engineering) (Level 4) [Ref: 0699] have been replaced by the National Certificate in Motor Industry (Automotive Electrical and Mechanical Engineering) (Level 3) with strands in Electrical and Electronics, Light Vehicle, Motorcycle, Outdoor Power Equipment, and Trailer Boat Systems [Ref: 1421] and the National Certificate in Motor Industry (Automotive Electrical and Mechanical Engineering) (Level 4) with strands in Electrical and Electronics, Light Vehicle, Motorcycle, Outdoor Power Equipment, and Trailer Boat Systems [Ref: 1422].

The last date for entry into this qualification is 31 December 2016.

People currently working towards this qualification must complete the requirements by 31 December 2020.

For detailed information see Review Summaries on the NZQA website.

NZQF National Qualification Registration Information

Process	Version	Date	Last Date for Assessment
Registration	1	January 1996	December 2002
Revision	2	January 1996	December 2002
Review	3	September 1999	December 2012
Revision	4	November 2000	December 2012
Review	5	August 2008	December 2012
Revision	6	November 2010	December 2020
Republished	6	November 2016	December 2020

Standard Setting Body

NZ Motor Industry Training Organisation (Incorporated)
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Other standard setting bodies whose standards are included in the qualification

NZQA

National Certificate in Motor Industry (Automotive Electrical Engineering)

Level **4**

Credits **244**

Purpose

This certificate is designed as the national qualification for people working in the Automotive Electrical Engineering branch of the Motor Industry. Holders of this qualification are able to consult with customers and estimate the cost of repairs; inspect vehicles for electrical and electronic faults; repair wiring circuits; carry out unit repairs off the vehicle; and diagnose and rectify faults in 12 and 24 volt electrical and electronic components and circuits on vehicles, machines, and equipment. The certificate is designed for people wishing to work in a safe and professional manner; to maintain standards in the automotive electrical engineering industry; and to provide a means of recognising prior learning for those already working in the industry.

This certificate is now linked to exit points for industry recognition purposes, where apprentices may on application receive NZ Motor Industry Training Organisation (MITO) certificates for credits achieved.

Details regarding industry recognition, industry registration, and entry and exit points for the apprenticeship can be obtained from the NZ Motor Industry Training Organisation in the first instance. Standards in this qualification have relevance to other automotive engineering qualifications, and those people who wish to consider additional standards or qualifications should contact the NZ Motor Industry Training Organisation for advice.

Replacement Information

This qualification, the National Certificate in Motor Industry (Motorcycle Engineering) [Ref: 0015], National Certificate in Motor Industry (Automotive Engineering) [Ref: 0019], National Certificate in Motor Industry (Outdoor Power Equipment Servicing) [Ref: 0697], National Certificate in Motor Industry (Trailer Boat Systems Engineering) (Level 3) [Ref: 0698], and the National Certificate in Motor Industry (Trailer Boat Systems Engineering) (Level 4) [Ref: 0699] have been replaced by the National Certificate in Motor Industry (Automotive Electrical and Mechanical Engineering) (Level 3) with strands in Electrical and Electronics, Light Vehicle, Motorcycle, Outdoor Power Equipment, and Trailer Boat Systems [Ref: 1421] and the National Certificate in Motor Industry (Automotive Electrical and Mechanical Engineering) (Level 4) with strands in Electrical and Electronics, Light Vehicle, Motorcycle, Outdoor Power Equipment, and Trailer Boat Systems [Ref: 1422].

Special Notes

It is expected that most people will undertake training towards this qualification in the form of apprenticeship with the use of record of achievement books and training manuals. It is recommended that in the first instance, a "training plan" be developed with the assistance of a NZ Motor Industry Training Organisation representative.

Applications for recognition of prior learning should be made to the NZ Motor Industry Training Organisation or accredited training providers. Credits are not automatic and normally an assessment of ability is required.

Credit Range

	Compulsory	Elective
Level 1 credits	3	-
Level 2 credits	65	0-5
Level 3 credits	68	0-30
Level 4 credits	78	0-30
Level 5 credits	-	0-9
Level 6 credits	-	0-26
Minimum credits	214	30

Requirements for Award of Qualification

Award of NZQF National Qualifications

Credit gained for a standard may be used only once to meet the requirements of this qualification.

Unit standards and achievement standards that are equivalent in outcome are mutually exclusive for the purpose of award. The table of mutually exclusive standards is provided on the New Zealand Qualifications Authority (NZQA) website: http://www.nzqa.govt.nz/qualifications-standards/standards/standards-exclusion-list/.

Reviewed standards that continue to recognise the same overall outcome are registered as new versions and retain their identification number (ID). Any version of a standard with the same ID may be used to meet qualification requirements that list the ID and/or that specify the past or current classification of the standard.

Summary of Requirements

- Compulsory standards
- Elective – A minimum of 30 credits as specified

Detailed Requirements

Compulsory

The following standards are required

Engineering and Technology > Motor Industry > Automotive Administration

ID	Title	Level	Credit
392	Maintain automotive stock and plant security	2	2
934	Cost a job for an automotive repair or service	4	3
946	Book in work for an automotive business	4	4
968	Estimate the cost of an automotive repair	4	4
15368	Pick up and deliver a customer's vehicle, machine, or equipment	1	1

Engineering and Technology > Motor Industry > Automotive Air Conditioning

ID	Title	Level	Credit
902	Test a vehicle heating and ventilation system	3	3
906	Diagnose and rectify automotive climate control system faults	4	4
15373	Demonstrate knowledge of automotive air conditioning	3	4

Engineering and Technology > Motor Industry > Automotive Electrical and Electronics

ID	Title	Level	Credit
232	Test an automotive electrical circuit	2	8
233	Service an automotive battery	2	2
234	Describe automotive starting and charging systems and their operation	2	4
235	Describe automotive ignition systems and their operation	2	3
887	Diagnose and repair automotive wiper system faults	4	2
888	Overhaul a starter motor from a car and/or light commercial vehicle	3	3
891	Test, diagnose, and rectify faults in a contact breaker (CB) ignition system on an engine	3	2
895	Test, diagnose, and rectify faults in a conventional type electronic ignition system on an engine	3	4
897	Diagnose and repair faults in starting and charging systems on cars or light commercial vehicles	3	5
898	Identify an automotive wiring diagram and translate information to a motor vehicle circuit	3	3

ID	Title	Level	Credit
899	Carry out automotive wiring repairs and test circuits for serviceability	3	3
909	Install, repair, and replace electrical accessories in vehicles	3	2
910	Diagnose and rectify faults in automotive instruments and gauges	4	5
915	Service multiple battery installations on heavy commercial vehicles, machines, or units	3	2
2326	Inspect and test an ignition distributor, and rectify faults	3	2
2348	Diagnose and rectify faults in vehicle and machine body electronics	4	8
3399	Demonstrate knowledge of vehicle lighting and rectify lighting circuit faults	4	5
5456	Explain the operation of automotive alternators and alternator controls	3	4
5457	Test and repair automotive alternator circuits	4	4
5458	Explain the operation of heavy duty starter motors	4	4
5462	Explain the operation of automotive electronic ignition systems	4	5
5463	Explain the operation and repair requirements of automotive electronic control systems	4	8
5464	Explain automotive electrical and electronic applications	3	12
8182	Diagnose and rectify faults in automotive electronically controlled systems	4	6
16114	Demonstrate knowledge of vehicle security systems and their installation	3	4

Engineering and Technology > Motor Industry > Automotive Fuel Systems and Exhaust

ID	Title	Level	Credit
240	Demonstrate knowledge of petrol fuel systems	2	3
241	Describe the operation of a diesel fuel system and perform minor servicing tasks	2	3
5459	Explain the operation of automotive electronic fuel injection systems	3	4
5460	Test and repair automotive electronic fuel injection systems	4	4
15384	Demonstrate knowledge of electronic diesel management	4	4

Engineering and Technology > Motor Industry > Automotive Preventative Maintenance

ID	Title	Level	Credit
229	Identify the functions and general locations of motor vehicle systems and components	2	5
237	Describe automotive brake, steering, and suspension systems, and their operation	2	3
245	Select and apply lubricants and sealants for automotive and related industry applications	2	2
247	Prepare a vehicle and/or machine for use and shut-down after use	2	2

Engineering and Technology > Motor Industry > Automotive Transmission Systems

ID	Title	Level	Credit
239	Demonstrate knowledge of automotive manual transmissions	2	2

Engineering and Technology > Motor Industry > Automotive Workshop Engineering

ID	Title	Level	Credit
227	Carry out general engineering tasks to repair and make automotive components	2	4
228	Select and use hand tools and workshop equipment for an automotive application	2	5
924	Clean automotive components and maintain cleaning equipment	2	1
16113	Demonstrate knowledge of safe working practices in an automotive workshop	2	2

Engineering and Technology > Motor Industry > Engine Repairs

ID	Title	Level	Credit
231	Explain the operation of two and four stroke petrol and diesel engines	2	4
236	Service automotive cooling systems	2	4
243	Carry out basic tuning on a four stroke petrol engine	2	4
3400	Check a four stroke petrol engine for condition using hand held test equipment	3	4
5461	Explain the operation and testing of automotive emission controls	3	4

Engineering and Technology > Motor Industry > Power Boat Systems

ID	Title	Level	Credit
5433	Describe the application of electricity and electronics for marine use	4	8

Engineering and Technology > Motor Industry > Vehicle Bodywork

ID	Title	Level	Credit
2629	Demonstrate knowledge of, and work in proximity to, motor vehicle air bag mechanisms	3	2

Engineering and Technology > Motor Industry > Vehicle Recovery

ID	Title	Level	Credit
3387	Respond to vehicle breakdown	3	1

Service Sector > Service Sector Skills > Service Sector - Core Skills

ID	Title	Level	Credit
56	Attend to customer enquiries face-to-face and on the telephone	1	2
57	Provide customer service in given situations	2	2

Elective
A minimum of 30 credits

Engineering and Technology > Motor Industry > Automotive Administration

ID	Title	Level	Credit
382	Demonstrate knowledge of payment types, and carry out office procedures in an automotive company	3	4
386	Determine stock levels of automotive products	5	4
387	Demonstrate knowledge of stock ordering, and maintain stock for an automotive business	3	6
985	Control expense in an automotive department	6	6
988	Demonstrate knowledge of automotive Service Manager's roles	6	20
15370	Demonstrate knowledge of business responsibilities towards customers within the automotive industry	4	4

Engineering and Technology > Motor Industry > Automotive Air Conditioning

ID	Title	Level	Credit
881	Test, service, and repair an automotive air conditioning system	4	4
981	Install an automotive air conditioning system	4	3

Engineering and Technology > Motor Industry > Automotive Electrical and Electronics

ID	Title	Level	Credit
890	Diagnose and repair faults in electrical starting and charging systems on motorcycles	4	4
904	Diagnose faults in an automotive generator type charging system, and overhaul a DC generator	3	5
905	Overhaul an electric starter motor from a heavy commercial vehicle	4	5
907	Install audio entertainment systems in vehicles, repair installation faults, and replace components	4	4
966	Make up and install electronic circuitry to suit specific applications and components	5	5
975	Design a wiring harness for a particular automotive application	4	4
979	Diagnose and rectify faults in an engine flywheel ignition system	4	5
2339	Describe direct current electric motors used in forklifts, and repair speed control systems	4	6
15374	Diagnose and repair faults in electrical starting and charging systems on outdoor powered equipment	4	4
15375	Diagnose and repair faults in electronically controlled systems used on heavy vehicles and machines	4	8
15379	Demonstrate knowledge of, and service traction batteries on electric forklifts	3	3
16115	Install a security system in a vehicle	4	4

Engineering and Technology > Motor Industry > Automotive Fuel Systems and Exhaust

ID	Title	Level	Credit
930	Describe turbocharger operation, and service a turbocharger system on a vehicle or machine	3	3
951	Diagnose and rectify faults in a vehicle LPG (liquefied petroleum gas) fuel system	4	4

Engineering and Technology > Motor Industry > Automotive Sales

ID	Title	Level	Credit
385	Sell automotive products	3	4
11745	Demonstrate knowledge of and sell automotive service	3	4

Engineering and Technology > Motor Industry > Automotive Workshop Engineering

ID	Title	Level	Credit
230	Repair and manufacture automotive components by oxy-acetylene gas welding	2	3
914	Metal-arc gas shield (MIG) weld automotive components	3	4
15433	Repair ride-on battery powered equipment	4	8

Engineering and Technology > Motor Industry > Engine Repairs

ID	Title	Level	Credit
980	Service engine driven stationary and mobile generators and power units, and repair control systems	4	3

Engineering and Technology > Motor Industry > Power Boat Systems

ID	Title	Level	Credit
5436	Diagnose and rectify faults in marine starting and charging systems	4	4
15453	Install, test, and repair or replace electrical accessories on power boats	4	6

Engineering and Technology > Motor Industry > Vehicle Braking Systems

ID	Title	Level	Credit
242	Change the fluid and bleed a brake hydraulic system	2	2

Transition Arrangements

Version 6

Version 6 was issued to extend the expiry date of this qualification.

For detailed information see Review Summaries on the NZQA website.

Previous versions of the qualification

Version 5 was issued to indicate that this qualification is expiring.

This qualification, the National Certificate in Motor Industry (Motorcycle Engineering) [Ref: 0015], National Certificate in Motor Industry (Automotive Engineering) [Ref: 0019], National Certificate in Motor Industry (Outdoor Power Equipment Servicing) [Ref: 0697], National Certificate in Motor Industry (Trailer Boat Systems Engineering) (Level 3) [Ref: 0698], and the National Certificate in Motor Industry (Trailer Boat Systems Engineering) (Level 4) [Ref: 0699] have been replaced by the National Certificate in Motor Industry (Automotive Electrical and Mechanical Engineering) (Level 3) with strands in Electrical and Electronics, Light Vehicle, Motorcycle, Outdoor Power Equipment, and Trailer Boat Systems [Ref: 1421] and the National Certificate in Motor Industry (Automotive Electrical and Mechanical Engineering) (Level 4) with strands in Electrical and Electronics, Light Vehicle, Motorcycle, Outdoor Power Equipment, and Trailer Boat Systems [Ref: 1422].

Version 4 was issued in November 2000 in order to extend the last date of the award of versions 1 and 2 to December 2002. The content of the qualification was not changed.

Version 3 was issued in September 1999 as part of the Motor Industry unit standard review.

Changes to structure and content

- removal of prerequisite qualification the National Certificate in Motor Industry (Entry to Automotive Trades) [Ref: 0017];
- addition of standards 56, 57, 227, 228, 229, 231, 232, 233, 234, 235, 236, 237, 239, 240, 241, 243, 245, 247, 902, 906, 8182, 15368, 15373, 15384, 16113, and 16114 to the compulsory section. Many of these standards were previously covered by being included in the prerequisite qualification;
- the elective section has been expanded;
- standards 385, 904, 966, and 975 moved from the compulsory section to the elective section;
- elective standards 389 and 950 have been removed from the qualification;
- credit total for the qualification increased from 147 to 244.

Version 2 was issued following an earlier review of Motor Industry standards.

Version 1 replaced the Trade Certificate in Automotive Electrical Engineering with the National Certificate in Motor Industry (Automotive Electrical Engineering). The Trade Certificate continues to be recognised by the NZQA, the NZ Motor Industry Training Organisation, and the motor industry. There is no requirement for holders of that qualification to seek a national certificate.

Certification

This certificate will display the logos of NZQA, the NZ Motor Industry Training Organisation (Incorporated) and the organisation that has been granted consent to assess against standards that meet the requirements of the qualification (accredited).

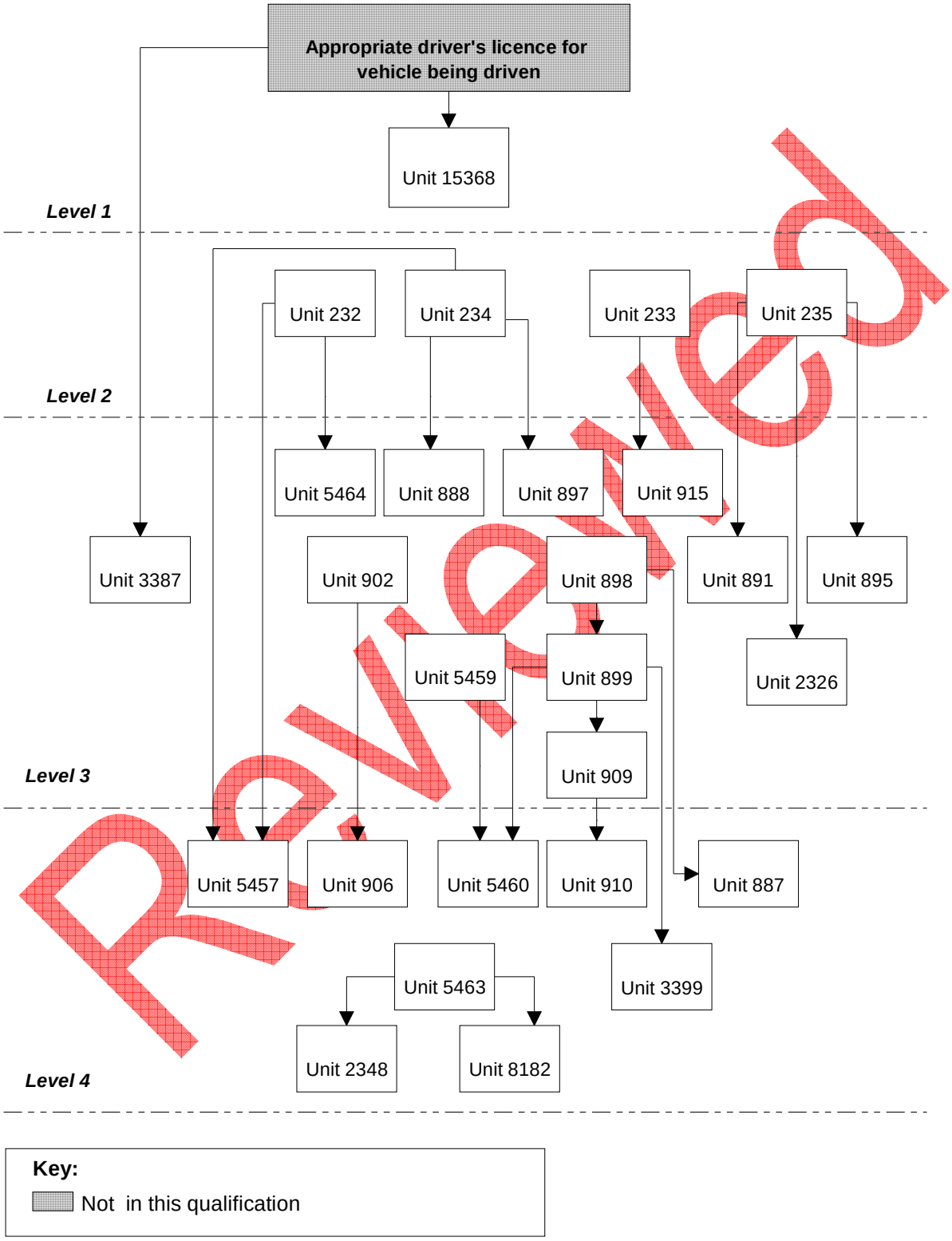
Classification

This qualification is classified according to the classification system listed on the Directory of Assessment Standards (DAS) and the New Zealand Standard Classification of Education (NZSCED) system as specified below.

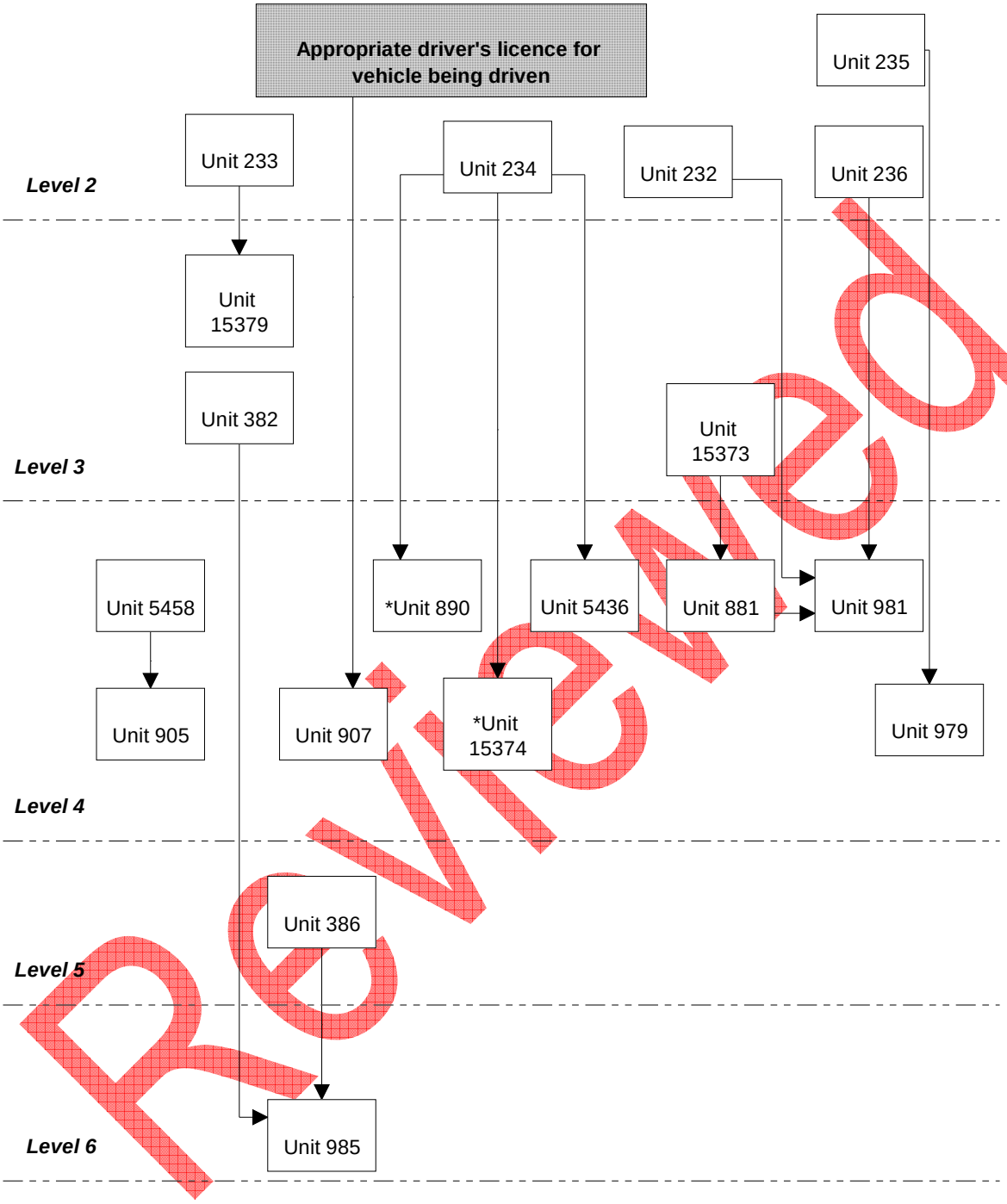
DAS Classification		**NZSCED**	
Code	**Description**	**Code**	**Description**
257	Engineering and Technology > Motor Industry	030505	Engineering and Related Technologies > Automotive Engineering and Technology > Automotive Electrics and Electronics

Quality Management Systems
Providers and Industry Training Organisations must be granted consent to assess by a recognised Quality Assurance Body before they can register credits from assessment against standards. Accredited providers and Industry Training Organisations assessing against standards must engage with the moderation system that applies to those standards. Accreditation requirements and the moderation system are outlined in the associated Accreditation and Moderation Action Plan (AMAP) for each standard.

Prerequisite Diagram



Prerequisite diagram for the elective unit standards



Key:

Unit standards not included in this qualification

* Unit standard appears in the diagram twice

Prerequisite diagram for the elective unit standards (continued)