

## National Certificate in Motor Industry (Automotive Specialist Engineering) (Level 3) with strands in Automotive Heating, Ventilation, and Air Conditioning; Automotive Machining; Diesel Fuel Injection; and Motorsport

**Level** 3

**Credits** 134-314

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

### Transition Arrangements

This qualification has been reviewed and replaced by New Zealand Certificate in Automotive Diesel Fuel Technology (Level 4) [Ref: 3454].

The Automotive Machining strand has been reviewed and replaced by New Zealand Certificate in Automotive Machining (Level 4) [Ref: 3522]

The last date for entry into training programmes or courses leading to replaced qualifications is 31 December 2018. The last date to meet the requirements of the replaced qualification is 31 December 2020, when the qualification will be discontinued. From that date no results can be reported against the qualification.

People currently working towards the replaced qualification must complete its requirements or transfer to a programme of study or training leading to a replacement qualification by 31 December 2020.

It is anticipated that no existing candidates will be disadvantaged by these transition arrangements. However, anyone who feels that they have been disadvantaged may appeal to MITO at the address below. Appeals will be considered on a case by case basis.

For detailed information see [Review Summaries](#) on the NZQA website.

This qualification contains expiring unit standards for which replacement unit standards have now been registered. For the purposes of this qualification, people who have gained credit for the replacement unit standards are exempt from the requirement to gain credit for the expiring unit standards.

Credit for	Exempt from
2415	25075
2418	25874
2419	25698, 25699
2420	25700, 25701

Credit for	Exempt from
406	28500
11986	28505

## NZQF National Qualification Registration Information

Process	Version	Date	Last Date for Assessment
Registration	1	August 2008	December 2019
Republished	1	January 2014	December 2019
Review	2	April 2016	December 2019
Revision	3	October 2016	December 2020

## Standard Setting Body

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REVIEWED

## **National Certificate in Motor Industry (Automotive Specialist Engineering) (Level 3) with strands in Automotive Heating, Ventilation, and Air Conditioning; Automotive Machining; Diesel Fuel Injection; and Motorsport**

<b>Level</b>	<b>3</b>
<b>Credits</b>	<b>134-315</b>

### **Purpose**

The National Certificate in Motor Industry (Automotive Specialist Engineering) (Level 3) with strands in Automotive Heating, Ventilation, and Air Conditioning; Automotive Machining; Diesel Fuel Injection; and Motorsport [Ref: 1415] recognises the skills and knowledge required for people in roles, within the automotive specialist sector of the motor industry, that involve general vehicle and vehicle component repair and service work at an introductory to intermediate level.

The qualification includes a Core Compulsory and Core Elective section. This core covers knowledge and skills in generic areas such as health and safety, communication, customer service, and self-management, as well as industry specific knowledge and skills including: quality control and industry standards, legislation, tools and equipment used in the industry, cleaning components, general engineering tasks, new and emerging technology, business responsibilities towards customers, stock security in the workplace, and the protection of vehicle electronics. Each strand comprises a set of compulsory standards, which reflect the specific requirements of each of the automotive specialist industry sectors, and an elective section that allows candidates to add further skills that are relevant to their position and/or specific workplace requirements.

In order to recognise a minimum and consistent set of fundamental competencies across all roles in all qualifications at each level, a common set of standards appear consistently across the core sections in all of the Level 3 qualifications in the *Motor Industry* subfield. This structure has been modelled on the *Qualifications Roadmap* (the motor industry career pathway document), which allows a candidate to move more easily between strands of qualifications in similar areas and to transfer skills from this qualification to other motor industry qualifications.

The qualification strands recognise the competencies required to work in a range of automotive specialist workplaces in:

- automotive heating, ventilation, and air conditioning (HVAC) roles involved in the overall repair and servicing of HVAC and climate control units and their components in a manner that ensures compliance with legislative and environmental requirements
- automotive machining roles involved in the machining and reconditioning of engine and related automotive components

- diesel fuel injection roles involved in the reconditioning and servicing of diesel fuel pumps and governors
- motorsport roles requiring all aspects of competition vehicle preparation and maintenance before, during, and after race events, and vehicle and personal compliance with race event requirements.

This qualification is one of a suite of qualifications developed at the introductory to intermediate level for the motor industry. The qualifications in this suite are grouped to reflect the industry recognised sector subsets of: automotive body, automotive electrical and mechanical engineering, automotive heavy engineering, automotive specialist engineering, and vehicle servicing. In most cases these subsets are also divided into two levels to provide clearer entry points to and exit points from training.

People wishing to obtain information on career pathways should contact the NZ Motor Industry Training Organisation Incorporated (see contact details below).

While they are not considered prerequisites to this qualification, candidates may follow on from the National Certificate in Motor Industry (Foundation Skills) (Level 1) [Ref: 1222] or the National Certificate in Motor Industry (Entry Skills) (Level 2) with strands in Automotive Electrical and Mechanical, and Collision Repair [Ref: 1252], as a number of standards are common to these qualifications.

This qualification is a prerequisite for the award of the National Certificate in Motor Industry (Automotive Specialist Engineering) (Level 4) with strands in Automotive Heating, Ventilation, and Air Conditioning; Automotive Machining; Diesel Fuel Injection; and Motorsport [Ref: 1416].

## Replacement Information

This qualification and the National Certificate in Motor Industry (Automotive Specialist Engineering) (Level 4) with strands in Automotive Heating, Ventilation, and Air Conditioning; Automotive Machining; Diesel Fuel Injection; and Motorsport [Ref: 1416] replaced the National Certificate in Motor Industry (Automotive Air Conditioning) [Ref: 0002], the National Certificate in Motor Industry (Automotive Machining) [Ref: 0371], and the National Certificate in Motor Industry (Diesel Fuel Injection Engineering) [Ref: 0139].

## Special Notes

Application for the recognition of current competency should be made to the NZ Motor Industry Training Organisation or an accredited training provider. Credits are not automatic and an assessment of ability is required.

## Credit Range

	Core Compulsory	Core Elective
Level 1 credits	-	0-4
Level 2 credits	33	0-6
Level 3 credits	4	0-6
Minimum totals	37	6

	<b>Automotive Heating, Ventilation, and Air Conditioning Strand</b>		<b>Automotive Machining Strand</b>	
	<b>Compulsory</b>	<b>Elective</b>	<b>Compulsory</b>	<b>Elective</b>
Level 2 credits	33	0-6	81	0-14
Level 3 credits	52	0-6	64	0-14
Level 4 credits	4	-	-	-
Minimum totals	89	6	145	14
Qualification total	138		202	

	<b>Diesel Fuel Injection Strand</b>	
	<b>Compulsory</b>	<b>Elective</b>
Level 2 credits	25	0-18
Level 3 credits	30	0-18
Level 4 credits	18	0-18
Minimum totals	73	18
Qualification total	134	

	<b>Motorsport Strand</b>			
	<b>Compulsory</b>	<b>Elective 1</b>	<b>Elective 2</b>	<b>Elective 3</b>
Level 1 credits	2	-	-	-
Level 2 credits	79	0-39	0-9	0-12
Level 3 credits	109	0-39	7-20	6-18
Level 4 credits	5	-	0-4	-
Minimum totals	195	39	20	18
Qualification total	315			

## 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

- Core Compulsory standards
- Core Elective – A minimum of 6 credits as specified

One of the following strands is required

- Automotive Heating, Ventilation, and Air Conditioning Strand
- Automotive Machining Strand
- Diesel Fuel Injection Strand
- Motorsport Strand

## Detailed Requirements

### Core Compulsory

The following standards are required

Core Generic > Core Generic > Self-Management

ID	Title	Level	Credit
7123	Demonstrate knowledge of problem solving and apply a problem solving technique to a problem	2	2

Engineering and Technology > Motor Industry > Automotive Administration

ID	Title	Level	Credit
249	Carry out automotive industry personal workplace requirements	2	5
21078	Demonstrate knowledge of quality control standards in the motor and related industries	3	2
23743	Demonstrate knowledge of general legislation and regulations in the motor industry	3	2

Engineering and Technology > Motor Industry > Automotive Electrical and Electronics

ID	Title	Level	Credit
3877	Demonstrate knowledge of protecting vehicle electronics in the motor industry	2	2

Engineering and Technology > Motor Industry > Automotive Workshop Engineering

ID	Title	Level	Credit
924	Clean automotive components and maintain cleaning equipment	2	1
21671	Carry out general engineering tasks in the motor industry	2	4
21718	Demonstrate knowledge of hazardous materials used in the motor and related industries	2	2
21858	Demonstrate good work habits and perform safe work practices in the motor and related industries	2	4
21859	Select and use hand tools and workshop equipment for an automotive application	2	2

## Engineering and Technology &gt; Motor Industry &gt; Motor Industry - Introductory Skills

ID	Title	Level	Credit
3856	Identify emergency procedures in the motor and related industries	2	2
16113	Demonstrate knowledge of safe working practices in an automotive workshop	2	2
21668	Demonstrate knowledge of cleaning automotive components	2	2
21669	Demonstrate knowledge of hand tools and workshop equipment for motor industry applications	2	2
21670	Demonstrate knowledge of general engineering tasks in the motor industry	2	3

**Core Elective**

A minimum of 6 credits

## Core Generic &gt; Core Generic &gt; Work and Study Skills

ID	Title	Level	Credit
7118	Manage own learning programme	2	3

## Engineering and Technology &gt; Motor Industry &gt; Automotive Administration

ID	Title	Level	Credit
21672	Demonstrate knowledge of new and emerging technology in the motor industry	2	5
21673	Demonstrate knowledge of maintaining stock security in the motor and related industries	2	2
21708	Maintain stock security in the workplace in the motor and related industries	3	2
24077	Demonstrate knowledge of business responsibilities towards customers within the automotive industry	3	1

## Humanities &gt; Communication Skills &gt; Interpersonal Communications

ID	Title	Level	Credit
1277	Communicate information in a specified workplace	2	3

## Humanities &gt; Communication Skills &gt; Reading

ID	Title	Level	Credit
2990	Read texts to research information	3	4

## Service Sector &gt; Service Sector Skills &gt; Service Sector - Core Skills

ID	Title	Level	Credit
56	Attend to customer enquiries face-to-face and on the telephone	1	2

ID	Title	Level	Credit
64	Perform calculations for the workplace	1	2

### Automotive Heating, Ventilation, and Air Conditioning Strand

Meet the requirements of all of the following sets

- Automotive Heating, Ventilation, and Air Conditioning Compulsory
- Automotive Heating, Ventilation, and Air Conditioning Elective

### Automotive Heating, Ventilation, and Air Conditioning Compulsory

The following standards are required

Engineering and Technology > Mechanical Engineering > Refrigeration and Air Conditioning

ID	Title	Level	Credit
19666	Demonstrate knowledge of ozone and how it relates to the refrigeration and air conditioning industry	3	3

Engineering and Technology > Motor Industry > Automotive Electrical and Electronics

ID	Title	Level	Credit
233	Service an automotive battery	2	2
898	Identify a wiring diagram and translate information to a circuit in the motor and related industries	3	3
5742	Protect electronics when servicing or repairing a vehicle or machine in the motor industry	3	2
21667	Demonstrate knowledge of testing automotive electrical circuits	2	3
21675	Demonstrate knowledge of automotive batteries	2	2
21676	Select test equipment and test an automotive electrical circuit	2	4
21707	Demonstrate knowledge of automotive electrical principles	2	6
24105	Demonstrate knowledge of wiring and wiring diagrams used in automotive circuits	3	2
24106	Carry out automotive wiring repairs and replace a wiring circuit	3	2
24131	Demonstrate knowledge of electronic components and their application in the automotive industry	3	5
24132	Demonstrate knowledge of integrated electronic devices, multiplexing, and microprocessors in the motor industry	3	4

Engineering and Technology > Motor Industry > Automotive Heating, Ventilation, and Air Conditioning

ID	Title	Level	Credit
902	Test a vehicle heating and ventilation system	3	3



ID	Title	Level	Credit
981	Install an automotive air conditioning system	3	3
3397	Convert an automotive air conditioning system from R-12 to R-134a	3	2
15373	Demonstrate knowledge of automotive air conditioning	3	4
24445	Remove and replace automotive air conditioning components	3	2
24447	Recover refrigerant from, and evacuate and charge an automotive air conditioning system	3	2
24448	Demonstrate knowledge of servicing automotive air conditioning systems	3	2
24449	Prepare to test, and test an automotive air conditioning system for leaks	3	2
24451	Inspect and service automotive air conditioning equipment	3	2

## Engineering and Technology &gt; Motor Industry &gt; Automotive Preventive Maintenance

ID	Title	Level	Credit
229	Identify the general locations and functions of motor vehicle systems and main components	2	4
21680	Demonstrate knowledge of automotive lubricants and sealants	2	2
21716	Select and apply lubricants and sealants for automotive and related industry applications	2	1

## Engineering and Technology &gt; Motor Industry &gt; Automotive Workshop Engineering

ID	Title	Level	Credit
21714	Demonstrate knowledge of fastening systems used in the motor industry	2	2
21715	Select and use fastening systems in the motor industry	2	2

## Engineering and Technology &gt; Motor Industry &gt; Engines

ID	Title	Level	Credit
21686	Demonstrate knowledge of automotive cooling systems	2	2
21717	Service automotive cooling systems	2	3
24269	Demonstrate knowledge of cooling system operation, and factors that affect system efficiency on vehicles or machines	3	4

## Engineering and Technology &gt; Motor Industry &gt; Vehicle Bodywork

ID	Title	Level	Credit
22799	Demonstrate safety precautions on vehicles fitted with air bags and/or seatbelt pre-tensioners	3	1

ID	Title	Level	Credit
22800	Describe safe working precautions on vehicles equipped with air bags and seatbelt pre-tensioners	3	2
23980	Demonstrate knowledge of removing and replacing vehicle dash panels and adjacent fittings	3	2
23981	Remove and replace vehicle dash panels and adjacent fittings	4	4

### Automotive Heating, Ventilation, and Air Conditioning Elective

A minimum of 6 credits

Business > Business Administration > Business Administration Services

ID	Title	Level	Credit
327	Document business transactions	2	4

Engineering and Technology > Motor Industry > Automotive Administration

ID	Title	Level	Credit
22785	Demonstrate knowledge of stock ordering and stocktaking in the motor or related industries	3	3
22786	Maintain stock and carry out stocktaking duties in the motor or related industries	3	3

Engineering and Technology > Motor Industry > Automotive Sales

ID	Title	Level	Credit
383	Demonstrate knowledge of purchasing and storing automotive parts and accessories	3	3

Engineering and Technology > Motor Industry > Vehicle Bodywork

ID	Title	Level	Credit
912	Remove, repair, and replace vehicle body interior components	3	3

### Automotive Machining Strand

Meet the requirements of all of the following sets

- Automotive Machining Compulsory
- Automotive Machining Elective

### Automotive Machining Compulsory

The following standards are required

Engineering and Technology > Mechanical Engineering > Engineering Core Skills

ID	Title	Level	Credit
21906	Perform basic mechanical engineering machining operations under supervision	2	12

## Engineering and Technology &gt; Mechanical Engineering &gt; Engineering Drawing and Design

ID	Title	Level	Credit
21910	Interpret mechanical engineering drawings	3	5

## Engineering and Technology &gt; Mechanical Engineering &gt; Engineering Machining and Toolmaking

ID	Title	Level	Credit
2714	Produce components by performing engineering turning operations	3	15
11662	Produce components by performing basic engineering turning operations	2	12
11663	Produce components by performing basic engineering milling operations	2	12

## Engineering and Technology &gt; Mechanical Engineering &gt; Engineering - Measurement

ID	Title	Level	Credit
4435	Select, use, and care for engineering dimensional measuring equipment	2	3
4438	Demonstrate knowledge of fits, limits, and tolerances in engineering	2	2

## Engineering and Technology &gt; Motor Industry &gt; Automotive Electrical and Electronics

ID	Title	Level	Credit
235	Describe automotive ignition systems and their operation	2	4
21675	Demonstrate knowledge of automotive batteries	2	2

## Engineering and Technology &gt; Motor Industry &gt; Automotive Fuel Systems and Exhaust

ID	Title	Level	Credit
240	Demonstrate knowledge of petrol fuel systems	2	3
917	Remove and replace a diesel fuel injection pump	3	2
5461	Demonstrate knowledge of fuel emissions, and vehicle emission controls	3	4
21677	Demonstrate knowledge of a diesel fuel system	2	2

## Engineering and Technology &gt; Motor Industry &gt; Automotive Preventive Maintenance

ID	Title	Level	Credit
21680	Demonstrate knowledge of automotive lubricants and sealants	2	2
21716	Select and apply lubricants and sealants for automotive and related industry applications	2	1

## Engineering and Technology &gt; Motor Industry &gt; Automotive Workshop Engineering

ID	Title	Level	Credit
21714	Demonstrate knowledge of fastening systems used in the motor industry	2	2
21715	Select and use fastening systems in the motor industry	2	2
23809	Demonstrate knowledge of non-destructive testing of automotive components	3	2
23810	Carry out a non-destructive test to determine serviceability of automotive components	3	2

## Engineering and Technology &gt; Motor Industry &gt; Engines

ID	Title	Level	Credit
231	Explain the operation of two and four stroke petrol and diesel engines	2	4
243	Carry out basic tuning on a four stroke petrol engine under supervision	2	4
244	Disassemble and reassemble a four cylinder four stroke engine to a running state	2	6
11729	Inspect and machine engine piston and connecting rod assemblies	3	6
21686	Demonstrate knowledge of automotive cooling systems	2	2
21687	Demonstrate knowledge of basic tuning on a four stroke petrol engine	2	3
21717	Service automotive cooling systems	2	3
24269	Demonstrate knowledge of cooling system operation, and factors that affect system efficiency on vehicles or machines	3	4
24274	Carry out general repairs to a cylinder head that does not require machining	3	2
24275	Disassemble, inspect, and reassemble an engine short block under general supervision	3	3
24287	Demonstrate knowledge of disassembling, inspecting, and reassembling an engine short block	3	2
24291	Demonstrate knowledge of inspecting and machining engine piston and connecting rod assemblies	3	6
24297	Demonstrate knowledge of engine gasket and sealant options	3	2
24302	Demonstrate knowledge of disassembling, inspecting, and reassembling an engine cylinder head	3	2
24306	Carry out general repairs to an engine short block	3	3
24807	Remove, disassemble, inspect, reassemble, and refit an engine cylinder head	3	4

**Automotive Machining Elective**

A minimum of 14 credits

## Engineering and Technology &gt; Mechanical Engineering &gt; Welding

ID	Title	Level	Credit
2677	Weld aluminium with the gas tungsten arc welding process in the downhand positions	3	6
21907	Demonstrate and apply knowledge of safe welding procedures under supervision	2	3

## Engineering and Technology &gt; Motor Industry &gt; Automotive Electrical and Electronics

ID	Title	Level	Credit
233	Service an automotive battery	2	2
5742	Protect electronics when servicing or repairing a vehicle or machine in the motor industry	3	2
21667	Demonstrate knowledge of testing automotive electrical circuits	2	3
21676	Select test equipment and test an automotive electrical circuit	2	4

## Engineering and Technology &gt; Motor Industry &gt; Automotive Fuel Systems and Exhaust

ID	Title	Level	Credit
21692	Perform minor servicing tasks on a diesel fuel system	2	2
24234	Perform minor servicing tasks on a petrol fuel system	2	2

## Engineering and Technology &gt; Motor Industry &gt; Automotive Preventive Maintenance

ID	Title	Level	Credit
24338	Service bearings and seals in vehicles or equipment	3	3

## Engineering and Technology &gt; Motor Industry &gt; Automotive Workshop Engineering

ID	Title	Level	Credit
21682	Demonstrate knowledge of an oxy-acetylene welding plant in the motor industry	2	2
21683	Demonstrate knowledge of MIG welding in the motor industry	2	2
21685	Use an oxy-acetylene welding plant in the motor industry	2	3
23992	Use and maintain a gas metal arc welding (GMAW) plant in the motor and related industries	3	5
24372	Manual metal arc weld automotive components	3	4
24373	Demonstrate knowledge of the manual metal arc welding process in the motor industry	3	2

## Engineering and Technology &gt; Motor Industry &gt; Engines

ID	Title	Level	Credit
3400	Check a four stroke petrol engine for condition using hand held test equipment	3	4
15445	Diagnose and rectify motorcycle engine piston and cylinder assembly faults	3	5
15446	Remove and replace a light vehicle engine cam belt	3	3

**Diesel Fuel Injection Strand**

Meet the requirements of all of the following sets

- Diesel Fuel Injection Compulsory
- Diesel Fuel Injection Elective

**Diesel Fuel Injection Compulsory**

The following standards are required

## Engineering and Technology &gt; Motor Industry &gt; Automotive Electrical and Electronics

ID	Title	Level	Credit
898	Identify a wiring diagram and translate information to a circuit in the motor and related industries	3	3
21667	Demonstrate knowledge of testing automotive electrical circuits	2	3
21676	Select test equipment and test an automotive electrical circuit	2	4
21707	Demonstrate knowledge of automotive electrical principles	2	6

## Engineering and Technology &gt; Motor Industry &gt; Automotive Fuel Systems and Exhaust

ID	Title	Level	Credit
917	Remove and replace a diesel fuel injection pump	3	2
5459	Demonstrate knowledge of automotive electronic fuel injection system operation, and fault diagnosis and repair	3	4
15397	Repair two-spring type diesel fuel injectors	4	4
15402	Diagnose faults in diesel fuel injectors on an engine, and remove and replace injectors	3	3
15403	Test and diagnose diesel fuel injection systems, and repair fuel delivery systems	3	4
21677	Demonstrate knowledge of a diesel fuel system	2	2
21692	Perform minor servicing tasks on a diesel fuel system	2	2
24179	Demonstrate knowledge of a forced air intake system on an engine	3	4
24180	Inspect and test diesel engine intake and exhaust systems	3	4

ID	Title	Level	Credit
24195	Demonstrate knowledge of diesel fuel injectors	3	4
24196	Repair diesel fuel injectors	4	4
24210	Demonstrate knowledge of VE-type diesel fuel injection pumps	4	2
24211	Overhaul a VE-type diesel fuel injection pump	4	6
24222	Demonstrate knowledge of VE-type diesel injection pump additional devices	4	2

## Engineering and Technology &gt; Motor Industry &gt; Automotive Preventive Maintenance

ID	Title	Level	Credit
229	Identify the general locations and functions of motor vehicle systems and main components	2	4

## Engineering and Technology &gt; Motor Industry &gt; Engines

ID	Title	Level	Credit
231	Explain the operation of two and four stroke petrol and diesel engines	2	4
929	Test and rectify starting aid system faults on a diesel engine	3	2

**Diesel Fuel Injection Elective**

A minimum of 18 credits

## Business &gt; Business Administration &gt; Business Administration Services

ID	Title	Level	Credit
327	Document business transactions	2	4

## Engineering and Technology &gt; Motor Industry &gt; Automotive Administration

ID	Title	Level	Credit
934	Cost a job for the supply of a product, repair, or service in the motor and related industries	3	3
22785	Demonstrate knowledge of stock ordering and stocktaking in the motor or related industries	3	3
22786	Maintain stock and carry out stocktaking duties in the motor or related industries	3	3

## Engineering and Technology &gt; Motor Industry &gt; Automotive Electrical and Electronics

ID	Title	Level	Credit
233	Service an automotive battery	2	2
234	Describe automotive starting and charging systems and their operation	2	4

ID	Title	Level	Credit
897	Diagnose and rectify faults in light vehicle starting and charging systems	4	5

## Engineering and Technology &gt; Motor Industry &gt; Automotive Fuel Systems and Exhaust

ID	Title	Level	Credit
15382	Remove and refit a turbocharger to an engine	2	2
19303	Demonstrate knowledge of unit type diesel fuel injectors	3	3
24232	Demonstrate knowledge of turbocharger diagnostic procedures	4	2
24233	Diagnose faults and recondition an automotive turbocharger	4	5

## Engineering and Technology &gt; Motor Industry &gt; Automotive Preventive Maintenance

ID	Title	Level	Credit
21680	Demonstrate knowledge of automotive lubricants and sealants	2	2
21716	Select and apply lubricants and sealants for automotive and related industry applications	2	1

## Engineering and Technology &gt; Motor Industry &gt; Automotive Sales

ID	Title	Level	Credit
380	Carry out an appraisal of a vehicle, machine or product in the motor or related industries	4	4

## Engineering and Technology &gt; Motor Industry &gt; Automotive Workshop Engineering

ID	Title	Level	Credit
21682	Demonstrate knowledge of an oxy-acetylene welding plant in the motor industry	2	2
21683	Demonstrate knowledge of MIG welding in the motor industry	2	2
21685	Use an oxy-acetylene welding plant in the motor industry	2	3
21714	Demonstrate knowledge of fastening systems used in the motor industry	2	2
21715	Select and use fastening systems in the motor industry	2	2
23992	Use and maintain a gas metal arc welding (GMAW) plant in the motor and related industries	3	5

## Engineering and Technology &gt; Motor Industry &gt; Engines

ID	Title	Level	Credit
2313	Rectify fuel injection pump drive faults on diesel engines	4	2



ID	Title	Level	Credit
24807	Remove, disassemble, inspect, reassemble, and refit an engine cylinder head	3	4

## Engineering and Technology &gt; Motor Industry &gt; Vehicle Recovery

ID	Title	Level	Credit
3387	Respond to vehicle and/or machine breakdown	3	1

## Service Sector &gt; Retail, Distribution, and Sales &gt; Stock Control

ID	Title	Level	Credit
28505	Establish and maintain stock levels, and collate and dispatch customer orders in a retail or distribution facility	4	10

**Motorsport Strand**

Meet the requirements of all of the following sets

- Motorsport Compulsory
- Motorsport Elective 1
- Motorsport Elective 2
- Motorsport Elective 3

**Motorsport Compulsory**

The following standards are required

## Computing and Information Technology &gt; Computing &gt; Generic Computing

ID	Title	Level	Credit
2780	Demonstrate and apply knowledge of a personal computer system	2	9

## Engineering and Technology &gt; Mechanical Engineering &gt; Engineering - Fabrication

ID	Title	Level	Credit
16955	Calculate sizes, mass, volumes, and quantities for engineering fabrication	3	4

## Engineering and Technology &gt; Mechanical Engineering &gt; Engineering - Measurement

ID	Title	Level	Credit
4438	Demonstrate knowledge of fits, limits, and tolerances in engineering	2	2

## Engineering and Technology &gt; Motor Industry &gt; Automotive Administration

ID	Title	Level	Credit
15371	Manage time and personal stress in an automotive or related industry department	2	3
23796	Meet employment requirements and work in a motorsport environment	2	4

ID	Title	Level	Credit
23797	Comply with motorsport regulations and motorsport event safety requirements	3	3
23798	Collect and record information from a competition race vehicle's electronic data analysis system	3	2
23799	Carry out pit lane, pit paddock, and/or service park operations at a motorsport event	3	4

## Engineering and Technology &gt; Motor Industry &gt; Automotive Electrical and Electronics

ID	Title	Level	Credit
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	4
898	Identify a wiring diagram and translate information to a circuit in the motor and related industries	3	3
5742	Protect electronics when servicing or repairing a vehicle or machine in the motor industry	3	2
21667	Demonstrate knowledge of testing automotive electrical circuits	2	3
21675	Demonstrate knowledge of automotive batteries	2	2
21676	Select test equipment and test an automotive electrical circuit	2	4
21707	Demonstrate knowledge of automotive electrical principles	2	6
23803	Demonstrate knowledge of competition race vehicle electronic data analysis systems	3	1
23804	Demonstrate knowledge of communication systems used in competition race vehicles and teams	3	3
24105	Demonstrate knowledge of wiring and wiring diagrams used in automotive circuits	3	2
24106	Carry out automotive wiring repairs and replace a wiring circuit	3	2

## Engineering and Technology &gt; Motor Industry &gt; Automotive Fuel Systems and Exhaust

ID	Title	Level	Credit
240	Demonstrate knowledge of petrol fuel systems	2	3
5459	Demonstrate knowledge of automotive electronic fuel injection system operation, and fault diagnosis and repair	3	4
11733	Demonstrate knowledge of vehicle exhaust systems	3	4
24179	Demonstrate knowledge of a forced air intake system on an engine	3	4
24234	Perform minor servicing tasks on a petrol fuel system	2	2

## Engineering and Technology &gt; Motor Industry &gt; Automotive Preventive Maintenance

ID	Title	Level	Credit
21680	Demonstrate knowledge of automotive lubricants and sealants	2	2
21716	Select and apply lubricants and sealants for automotive and related industry applications	2	1

## Engineering and Technology &gt; Motor Industry &gt; Automotive Transmission Systems

ID	Title	Level	Credit
239	Demonstrate knowledge of automotive manual transmissions	2	2
918	Demonstrate knowledge of light vehicle final drive assembly operation	3	4
920	Describe the construction and operation of manual and semi-automatic transmissions used on light vehicles	3	4
922	Check and rectify faults in manual single plate clutches used on light vehicles	3	2
23808	Demonstrate knowledge of transmission requirements for competition race vehicles	3	4
24307	Demonstrate knowledge of driveline components on light vehicles	3	2
24308	Rectify driveline faults on light vehicles, and overhaul universal and constant velocity (CV) joints	3	3

## Engineering and Technology &gt; Motor Industry &gt; Automotive Workshop Engineering

ID	Title	Level	Credit
5743	Demonstrate knowledge of metals used on vehicles, and identify the effect of applying heat to metals	3	4
21714	Demonstrate knowledge of fastening systems used in the motor industry	2	2
21715	Select and use fastening systems in the motor industry	2	2
23809	Demonstrate knowledge of non-destructive testing of automotive components	3	2
23810	Carry out a non-destructive test to determine serviceability of automotive components	3	2

## Engineering and Technology &gt; Motor Industry &gt; Collision Repair

ID	Title	Level	Credit
5744	Demonstrate knowledge of vehicle body construction, and the effect of impact on vehicles	3	4

## Engineering and Technology &gt; Motor Industry &gt; Engines

ID	Title	Level	Credit
231	Explain the operation of two and four stroke petrol and diesel engines	2	4

ID	Title	Level	Credit
243	Carry out basic tuning on a four stroke petrol engine under supervision	2	4
943	Remove and install an engine assembly from and to a light vehicle	3	2
3400	Check a four stroke petrol engine for condition using hand held test equipment	3	4
21686	Demonstrate knowledge of automotive cooling systems	2	2
21687	Demonstrate knowledge of basic tuning on a four stroke petrol engine	2	3
21691	Disassemble and reassemble a single cylinder or multi-cylinder four stroke engine under supervision	1	2
21717	Service automotive cooling systems	2	3

## Engineering and Technology &gt; Motor Industry &gt; Tyres

ID	Title	Level	Credit
23813	Demonstrate knowledge of competition tyres and their applications for motorsport events	3	4

## Engineering and Technology &gt; Motor Industry &gt; Vehicle Bodywork

ID	Title	Level	Credit
23815	Demonstrate knowledge of body design features for competition race vehicles	4	5
23816	Demonstrate knowledge of body requirements and regulations for competition race vehicles	3	3

## Engineering and Technology &gt; Motor Industry &gt; Vehicle Braking Systems

ID	Title	Level	Credit
242	Change the fluid and bleed a brake hydraulic system	2	2
5466	Remove and replace light vehicle brake pads and shoes	3	2
21689	Demonstrate knowledge of hydraulic brake fluid, fluid replacement, and brake bleeding procedures	2	2
21720	Demonstrate knowledge of vehicle braking systems	2	2
23817	Demonstrate knowledge of braking principles and system component operation for light vehicles	3	5
23818	Demonstrate knowledge of braking system fault diagnosis and repair requirements for light vehicles	3	3
23819	Demonstrate knowledge of braking requirements for competition race vehicles	3	4
24408	Inspect braking system for safe operation on light vehicles, and inspect hydraulic components off the vehicle	3	3

## Engineering and Technology &gt; Motor Industry &gt; Vehicle Steering and Suspension

ID	Title	Level	Credit
23822	Demonstrate knowledge of competition race vehicle steering and suspension systems to suit motorsport events	3	4
24026	Demonstrate knowledge of motor vehicle wheel alignment	3	3
24564	Remove and replace steering and suspension components on motor vehicles or machines	3	3

**Motorsport Elective 1**

A minimum of 39 credits

## Engineering and Technology &gt; Mechanical Engineering &gt; Engineering Core Skills

ID	Title	Level	Credit
21906	Perform basic mechanical engineering machining operations under supervision	2	12

## Engineering and Technology &gt; Mechanical Engineering &gt; Engineering Drawing and Design

ID	Title	Level	Credit
21910	Interpret mechanical engineering drawings	3	5

## Engineering and Technology &gt; Mechanical Engineering &gt; Engineering - Fabrication

ID	Title	Level	Credit
2414	Lay out and mark off regular fabrication shapes under supervision	2	15
2416	Assemble and mechanically join plate and sheet under supervision	2	10
25075	Perform basic fabrication operations under supervision	2	12
25698	Form and shape light fabrication materials	4	20
25699	Form and shape heavy fabrication materials	4	20
25700	Assemble and join light fabrication materials	4	20
25701	Assemble and join heavy fabrication materials	4	20
25874	Lay out and mark off light fabrication shapes	4	15

## Engineering and Technology &gt; Mechanical Engineering &gt; Engineering Machining and Toolmaking

ID	Title	Level	Credit
2714	Produce components by performing engineering turning operations	3	15

ID	Title	Level	Credit
11662	Produce components by performing basic engineering turning operations	2	12
11663	Produce components by performing basic engineering milling operations	2	12

## Engineering and Technology &gt; Mechanical Engineering &gt; Welding

ID	Title	Level	Credit
2677	Weld aluminium with the gas tungsten arc welding process in the downhand positions	3	6
21907	Demonstrate and apply knowledge of safe welding procedures under supervision	2	3

## Engineering and Technology &gt; Motor Industry &gt; Automotive Workshop Engineering

ID	Title	Level	Credit
21682	Demonstrate knowledge of an oxy-acetylene welding plant in the motor industry	2	2
21683	Demonstrate knowledge of MIG welding in the motor industry	2	2
21685	Use an oxy-acetylene welding plant in the motor industry	2	3
23992	Use and maintain a gas metal arc welding (GMAW) plant in the motor and related industries	3	5

**Motorsport Elective 2**

A minimum of 20 credits

## Engineering and Technology &gt; Motor Industry &gt; Automotive Administration

ID	Title	Level	Credit
23801	Determine and comply with competition race vehicle and support equipment transportation requirements	3	2
23802	Prepare to transport competition race vehicles and support equipment to and from a motorsport event	2	2

## Engineering and Technology &gt; Motor Industry &gt; Automotive Electrical and Electronics

ID	Title	Level	Credit
891	Diagnose and rectify faults in a contact breaker (CB) ignition system on an engine	4	2
909	Install electrical accessories in vehicles, and test for and rectify faults	3	2
2326	Overhaul an ignition distributor	3	2
21719	Remove and replace motor vehicle lamps in the motor industry	2	1
24131	Demonstrate knowledge of electronic components and their application in the automotive industry	3	5

ID	Title	Level	Credit
24132	Demonstrate knowledge of integrated electronic devices, multiplexing, and microprocessors in the motor industry	3	4

## Engineering and Technology &gt; Motor Industry &gt; Automotive Fuel Systems and Exhaust

ID	Title	Level	Credit
8183	Demonstrate knowledge of the operation, service checks, fault diagnosis, and repair of carburettors	3	6
11735	Select, make, and fit exhaust brackets and mounts	2	2
21678	Remove, repair, and/or replace a vehicle and/or machine exhaust system	3	2
23805	Demonstrate knowledge of fuel systems and fuel system requirements for competition race vehicles	3	3
24180	Inspect and test diesel engine intake and exhaust systems	3	4
24191	Demonstrate knowledge of fabricating, assembling and fitting exhaust systems in the motor and related industries	4	2

## Engineering and Technology &gt; Motor Industry &gt; Automotive Preventive Maintenance

ID	Title	Level	Credit
381	Store a vehicle or machine	3	3

## Engineering and Technology &gt; Motor Industry &gt; Automotive Trailers

ID	Title	Level	Credit
23929	Repair light trailers in the motor and related industries	3	2
23930	Demonstrate knowledge of light trailer servicing requirements	3	2

## Engineering and Technology &gt; Motor Industry &gt; Automotive Transmission Systems

ID	Title	Level	Credit
24332	Diagnose and rectify oil leaks on transmission and driveline components on light vehicles	3	2
24690	Remove and replace an automatic transmission from and in a light vehicle	3	2

## Engineering and Technology &gt; Motor Industry &gt; Engines

ID	Title	Level	Credit
24269	Demonstrate knowledge of cooling system operation, and factors that affect system efficiency on vehicles or machines	3	4
24274	Carry out general repairs to a cylinder head that does not require machining	3	2

ID	Title	Level	Credit
24275	Disassemble, inspect, and reassemble an engine short block under general supervision	3	3
24287	Demonstrate knowledge of disassembling, inspecting, and reassembling an engine short block	3	2
24306	Carry out general repairs to an engine short block	3	3
24807	Remove, disassemble, inspect, reassemble, and refit an engine cylinder head	3	4

## Engineering and Technology &gt; Motor Industry &gt; Vehicle Braking Systems

ID	Title	Level	Credit
936	Make up brake pipes for a particular braking application	3	1
24409	Prepare and overhaul hydraulic braking system components from light vehicles	3	2

## Engineering and Technology &gt; Motor Industry &gt; Vehicle Steering and Suspension

ID	Title	Level	Credit
883	Check and adjust vehicle front and rear wheel alignment	3	4
884	Dismantle, inspect, and overhaul vehicle manual steering boxes and rack assemblies	3	2

## Service Sector &gt; Retail, Distribution, and Sales &gt; Stock Control

ID	Title	Level	Credit
28500	Maintain stock in a retail or distribution facility	3	15

**Motorsport Elective 3**

A minimum of 18 credits

## Engineering and Technology &gt; Mechanical Engineering &gt; Refrigeration and Air Conditioning

ID	Title	Level	Credit
19666	Demonstrate knowledge of ozone and how it relates to the refrigeration and air conditioning industry	3	3

## Engineering and Technology &gt; Motor Industry &gt; Automotive Heating, Ventilation, and Air Conditioning

ID	Title	Level	Credit
902	Test a vehicle heating and ventilation system	3	3
15373	Demonstrate knowledge of automotive air conditioning	3	4



## Engineering and Technology &gt; Motor Industry &gt; Automotive Plastic Repair

ID	Title	Level	Credit
23741	Demonstrate knowledge of plastics and plastic repairs used in the motor and related industries	3	2
23742	Repair plastic components in the motor and related industries	3	5

## Engineering and Technology &gt; Motor Industry &gt; Automotive Refinishing

ID	Title	Level	Credit
24020	Demonstrate knowledge of adhesive stripes and graphics in the motor industry	3	1
24021	Prepare and apply adhesive stripes and graphics to a vehicle or machine	3	3

## Engineering and Technology &gt; Motor Industry &gt; Collision Repair

ID	Title	Level	Credit
5766	Demonstrate knowledge of motor vehicle safety systems and working on damaged systems	3	4
23976	Demonstrate knowledge of a hydraulic jack and attachments in the motor industry	3	1
23977	Use and maintain a hydraulic jack and attachments in the motor industry	3	2
23978	Demonstrate knowledge of chassis alignment system equipment, measuring systems, and structural damage on a vehicle	3	4
23979	Use vehicle unibody chassis alignment equipment and measuring systems under supervision	3	6

## Engineering and Technology &gt; Motor Industry &gt; Vehicle Bodywork

ID	Title	Level	Credit
5465	Dismantle, clean, and store vehicle mechanical, electrical, and electronic components	3	4
21695	Repair minor panel damage, shrink, and metal finish a repair in the motor body industry	2	3
21697	Demonstrate knowledge of repairing minor panel damage and shrinking a repair in the motor industry	2	2
21704	Demonstrate knowledge of removing and replacing damaged bolted-on motor body panels	2	2
21705	Demonstrate knowledge of fillers, and filling and sanding a repair in the motor body industry	2	2
21709	Remove and replace damaged bolted-on motor body panels in the motor body industry	2	2
21710	Fill and sand a repair in the motor body industry	2	1
22801	Demonstrate knowledge of adhesives and sealants used in the motor body industry	3	4
22802	Select and use adhesives and sealants for vehicle bodywork applications	3	3

ID	Title	Level	Credit
23986	Demonstrate knowledge of glass reinforced plastic (GRP) and working with GRP repair kits for motor vehicles	3	2
23987	Use a glass reinforced plastic (GRP) repair kit to repair a damaged motor vehicle panel	3	2
24081	Prepare and fabricate a new motor body panel in the motor body industry	3	6
24082	Demonstrate knowledge of fabricating a new motor body panel in the motor body industry	3	2

## Transition Arrangements

This qualification and the National Certificate in Motor Industry (Automotive Specialist Engineering) (Level 4) with strands in Automotive Heating, Ventilation, and Air Conditioning; Automotive Machining; Diesel Fuel Injection; and Motorsport [Ref: 1416] replaced the National Certificate in Motor Industry (Automotive Machining) [Ref: 0371], the National Certificate in Motor Industry (Diesel Fuel Injection Engineering) [Ref: 0139], and the National Certificate in Motor Industry (Automotive Air Conditioning) [Ref: 0002].

Version 1 of this qualification was republished to include reverse transition arrangements for expiring standards 2414-2416 and 2418-2420.

Programmes leading to the new qualifications are being introduced from 2008. People currently working towards any of the replaced qualifications may either complete the requirements for that qualification or transfer their results to these qualifications.

The last date for entry to training programmes or courses for the replaced qualifications is 31 December 2009. The last dates for assessments to take place for the replaced qualifications are:

- National Certificate in Motor Industry (Automotive Air Conditioning) [Ref: 0002], 31 December 2011;
- National Certificate in Motor Industry (Automotive Machining) [Ref: 0371], 31 December 2012;
- National Certificate in Motor Industry (Diesel Fuel Injection Engineering) [Ref: 0139], 31 December 2012.

Industry will continue to recognise the former qualifications, so there should be no need to 'upgrade' by those who have already achieved one.

## Differences between new and replaced qualifications

There are substantial differences between the new and replaced qualifications. Changes include:

- The new qualifications have core compulsory and core elective sections.
- The new qualifications both have strands in Automotive Heating, Ventilation, and Air Conditioning; Automotive Machining; Diesel Fuel Injection; and Motorsport, with compulsory and elective sections in each strand.

- Candidates must complete a strand in the level 3 qualification [Ref: 1415] before they may progress to the corresponding strand in the level 4 qualification [Ref: 1416].

For detailed information see [Review Summaries](#) on the NZQA website.

Version 1 of this qualification contains standards that will expire in December 2014. For the purposes of this qualification, people who have gained credit for the substitute or replacement standards are exempt from the requirement to gain credit for the expiring standards – see table below.

Credit for	Exempt from
25075	2414, 2415, 2416
25698	2419
25700	2420
25874	2418

Version 1 of this qualification contains standards that replace or are being used as substitutes for expiring standards. For the purposes of this qualification, people who have gained credit for the expiring standards are exempt from the requirement to gain credit for the replacement or substitute standards – see table below.

Credit for	Exempt from
226 or 16098	21858
227 or 3879	21670, 21671
228 or 3880	21669, 21859
230 or 3885	21682, 21685
232	21676, 21707
236	21686, 21717
237	21720
241	21677, 21692
245	21680, 21716
382	327
385	12008
387	22785, 22786
391	934
392 or 5739	21673, 21708

<b>Credit for</b>	<b>Exempt from</b>
876	23741, 23742
896 or 15657	24564
899	24105, 24106
913	21685
914 or 5771	23992
921	24307, 24308
923	24274, 24807
925	24275, 24306
930	24179
933 or 5754 or 11738	21678
938	24408, 24409
941	23929, 23930
950	24372, 24373
958 or 15422	24690
965 or 3391	24269
2629	22799, 22800
2670	21907
3394	24191
3862	21704, 21709
3864	21719
3865	21705, 21710
3875 and 16110	21695, 21697
3876	24081, 24082
3883	21714, 21715
3884	21683
5464 or 8187	24131, 24132
5733	24020, 24021
5741	23976, 23977
5745	23978, 23979

Credit for	Exempt from
5755	23980, 23981
5757	24105
5764	23986, 23987
5767	23743
8184	23817, 23818
15375 or 15376	24131
15390	24210, 24211
15396	24222
15404	24179, 24180
15440	24807
16097	21718
19302	24195, 24196
19304	24232, 24233
19632	22801, 22802

It is anticipated that no existing trainees will be disadvantaged by these transition arrangements. Any person who feels they have been disadvantaged by these transition arrangements should contact MITO at the following address. All appeals will be considered on a case-by-case basis.

### Other standard setting bodies whose standards are included in the qualification

Competenz  
 NZQA  
 ServiceIQ

### 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.

## 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	030503	Engineering and Related Technologies > Automotive Engineering and Technology > Vehicle Mechanics

### 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. Organisation with consent to assess and Industry Training Organisations assessing against standards must engage with the moderation system that applies to those standards. Consent to assess requirements and the moderation system are outlined in the associated Consent and Moderation Requirements (CMR) for each standard.

REVIEWED