

National Certificate in Motor Industry (Automotive Heavy Engineering) (Level 3) with strands in Agricultural Equipment, Materials Handling Equipment, Plant and Equipment, and Road Transport

Level	3
Credits	227-250

This qualification has been **reviewed**. The last date to meet the requirements is 31 December 2019.

Transition Arrangements

This qualification has been reviewed and replaced by New Zealand Certificate in Heavy Automotive Engineering (Level 4) with strands in Road Transport, Plant and Equipment, Agricultural Equipment, and Materials Handling [Ref: 3118].

The last date for entry into training programmes or courses leading to replaced qualification is 31 December 2017.

The last date to meet the requirements of the replaced qualification is 31 December 2019, 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 2019.

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 standards that will expire December 2018. Exemptions have been included in this qualification so people can complete the qualification using either the expired standards or replacement standards.

For the purpose of this qualification, people who have gained credit for the replacement standards are exempt from the requirement to gain credit for the expiring standards – see table below.

Credit for	Exempt from
29372	24234
29582	24077

Credit for	Exempt from
29579, 29580	21858
29371 or 30571	21707 and 21667

NZQF National Qualification Registration Information

Process	Version	Date	Last Date for Assessment
Registration	1	September 2008	December 2019
Review	2	December 2015	December 2019
Republished	2	December 2018	December 2019

Standard Setting Body

MITO New Zealand Incorporated
 PO Box 10803
 WELLINGTON

Telephone 0800 88 21 21
 Facsimile 04 494 0006
 Email info@mito.org.nz
 Website www.mito.org.nz



National Certificate in Motor Industry (Automotive Heavy Engineering) (Level 3) with strands in Agricultural Equipment, Materials Handling Equipment, Plant and Equipment, and Road Transport

Level	3
Credits	227-250

Purpose

The National Certificate in Motor Industry (Automotive Heavy Engineering) (Level 3) with strands in Agricultural Equipment, Materials Handling Equipment, Plant and Equipment, and Road Transport [Ref: 1445] recognises the skills and knowledge required for people in roles that involve general heavy vehicle and equipment repair and service work at an introductory to intermediate level and who work within the automotive heavy sector of the motor industry.

The qualification includes a core compulsory and core elective section common to each of the four strands. 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 common heavy vehicle or equipment electrics and electronics, fuel systems and exhausts, hydraulics, preventive maintenance, transmissions, engines, and braking systems. Each strand comprises a set of compulsory standards, which reflect the specific requirements of each of the automotive heavy industry sectors, and an elective section that allows candidates to add further skills that are relevant to their position and/or specific workplace requirements.

The qualification strands recognise the competencies required to work in a range of automotive heavy engineering workplaces in roles involving the overall repair and servicing of the following categories of heavy vehicle, machines, and equipment and their associated components:

- agricultural machines and equipment, including tractors, land maintenance and cultivation implements, and harvesting equipment
- materials handling equipment, including all electric and non-electric forklifts and other fuel or electric powered equipment designed for the movement of goods
- heavy plant and equipment, including construction, off-road, and earth moving equipment
- road transport, including all trucks, buses, heavy trailers and combination units that are deemed 'heavy vehicles' under Land Transport Rule definitions.

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 and exit points from training.

Industry wished to be able to recognise a minimum and consistent set of fundamental competencies across all roles in all qualifications at each level. This has resulted in a common set of standards that 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.

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 prerequisite qualifications 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 both qualifications. This qualification prepares people and is a prerequisite for the award of the National Certificate in Motor Industry (Automotive Heavy Engineering) (Level 4) with strands in Agricultural Equipment, Materials Handling Equipment, Plant and Equipment, and Road Transport [Ref: 1446].

Replacement Information

This qualification and the National Certificate in Motor Industry (Automotive Heavy Engineering) (Level 4) with strands in Agricultural Equipment, Materials Handling Equipment, Plant and Equipment, and Road Transport [Ref: 1446] replaced the National Certificate in Motor Industry (Automotive Heavy Engineering) with strands in Agricultural Equipment, Plant and Equipment, and Road Transport [Ref: 0003].

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	64	0-6
Level 3 credits	41	0-6
Minimum totals	105	6

	Agricultural Equipment Strand		Materials Handling Equipment Strand	
	Compulsory	Elective	Compulsory	Elective
Level 2 credits	9	0-21	18	0-15
Level 3 credits	79	3-28	83	0-26
Level 4 credits	-	0-4	8	0-17
Minimum totals	88	28	109	26
Qualification total	227		246	

	Plant and Equipment Strand		Road Transport Strand	
	Compulsory	Elective	Compulsory	Elective
Level 2 credits	18	0-16	20	0-9
Level 3 credits	71	4-25	101	6-18
Level 4 credits	4	0-5	-	0-3
Minimum totals	93	25	121	18
Qualification total	229		250	

Requirements for Award of Qualification

Award of NQF 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 in section 7 of the New Zealand Qualifications Authority (NZQA) Rules and Procedures publications available at <http://www.nzqa.govt.nz/ncea/acrp/index.html>.

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

- Agricultural Equipment Strand
- Materials Handling Equipment Strand
- Plant and Equipment Strand
- Road Transport 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
234	Describe automotive starting and charging systems and their operation	2	4
3877	Demonstrate knowledge of protecting vehicle electronics in the motor industry	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
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

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

ID	Title	Level	Credit
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
24179	Demonstrate knowledge of a forced air intake system on an engine	3	4

ID	Title	Level	Credit
24180	Inspect and test diesel engine intake and exhaust systems	3	4

Engineering and Technology > Motor Industry > Automotive Hydraulics

ID	Title	Level	Credit
23927	Demonstrate knowledge of automotive hydraulic principles, practices, systems and components	3	4
23928	Demonstrate knowledge of automotive hydraulic circuit diagrams and oil requirements	3	3

Engineering and Technology > Motor Industry > 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
24338	Service bearings and seals in vehicles or equipment	3	3

Engineering and Technology > Motor Industry > Automotive Transmission Systems

ID	Title	Level	Credit
2316	Demonstrate knowledge of heavy vehicle and machine driveline and drive assembly operation and terminology	3	3

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 > Motor Industry > Engines

ID	Title	Level	Credit
231	Explain the operation of two and four stroke petrol and diesel engines	2	4
21686	Demonstrate knowledge of automotive cooling systems	2	2
21717	Service automotive cooling systems	2	3

ID	Title	Level	Credit
24269	Demonstrate knowledge of cooling system operation, and factors that affect system efficiency on vehicles or machines	3	4

Engineering and Technology > Motor Industry > 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

Engineering and Technology > Motor Industry > Vehicle Braking Systems

ID	Title	Level	Credit
24422	Demonstrate knowledge of heavy vehicle and equipment disc brakes	3	2

Core Elective

A minimum of 6 credits

Core Generic > Core Generic > Work and Study Skills

ID	Title	Level	Credit
7118	Manage own learning programme	2	3

Engineering and Technology > Motor Industry > 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 > Communication Skills > Interpersonal Communications

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

Humanities > Communication Skills > Reading

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

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
64	Perform calculations for the workplace	1	2

Agricultural Equipment Strand

Meet the requirements of all of the following sets

- Agricultural Equipment Compulsory
- Agricultural Equipment Elective

Agricultural Equipment Compulsory

The following standards are required

Agriculture, Forestry and Fisheries > Agriculture > Agricultural Vehicles and Machinery

ID	Title	Level	Credit
19044	Describe the legal requirements and occupational hazards associated with tractor use	2	2

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
898	Identify a wiring diagram and translate information to a circuit in the motor and related industries	3	3
915	Service multiple battery installations on vehicles, machines, and/or units	3	3
21675	Demonstrate knowledge of automotive batteries	2	2

ID	Title	Level	Credit
24092	Demonstrate knowledge of automotive lighting systems, and headlamp adjustment	3	2
24093	Rectify simple vehicle lighting faults, and adjust vehicle lamps	3	3

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

ID	Title	Level	Credit
24192	Repair heavy vehicle or machine exhaust systems	3	3
24237	Demonstrate knowledge of the operation and testing of vehicle diesel emission controls	3	4

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

ID	Title	Level	Credit
15373	Demonstrate knowledge of automotive air conditioning	3	4

Engineering and Technology > Motor Industry > Automotive Hydraulics

ID	Title	Level	Credit
2314	Test and service hydraulic systems on equipment, vehicles, and/or machines	3	6

Engineering and Technology > Motor Industry > Automotive Preventive Maintenance

ID	Title	Level	Credit
2322	Carry out general service checks on heavy vehicles or equipment	3	4

Engineering and Technology > Motor Industry > Automotive Transmission Systems

ID	Title	Level	Credit
2318	Demonstrate knowledge of the construction and operation of heavy vehicle and equipment manual transmissions	3	4
3385	Demonstrate knowledge of heavy machine manual and power shift transmissions	3	4
24319	Demonstrate knowledge of hydrostatic transmission drives, and testing and diagnosing faults, on plant or machinery	3	2
24321	Demonstrate knowledge of belt and chain drive systems on plant and machinery	3	2
24331	Remove and replace heavy vehicle or equipment transmissions and clutches	3	3

Engineering and Technology > Motor Industry > Engines

ID	Title	Level	Credit
24287	Demonstrate knowledge of disassembling, inspecting, and reassembling an engine short block	3	2
24302	Demonstrate knowledge of disassembling, inspecting, and reassembling an engine cylinder head	3	2
24807	Remove, disassemble, inspect, reassemble, and refit an engine cylinder head	3	4

Engineering and Technology > Motor Industry > Tractor and Machine Systems

ID	Title	Level	Credit
5438	Demonstrate knowledge of the functions and general locations of tractor, agricultural machine, and equipment systems	2	4

Engineering and Technology > Motor Industry > Tyres

ID	Title	Level	Credit
24459	Demonstrate knowledge of tractor and agricultural machinery tyres and wheels	3	4
24460	Remove and refit wheels from tractors and agricultural machinery	3	2

Engineering and Technology > Motor Industry > Vehicle Braking Systems

ID	Title	Level	Credit
24416	Demonstrate knowledge of wheel tractor braking systems	3	3
24423	Inspect and repair heavy vehicle and equipment disc brakes	3	3
24425	Bleed a heavy equipment or tractor mineral oil braking system	2	1

Engineering and Technology > Motor Industry > Vehicle Recovery

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

Engineering and Technology > Motor Industry > Vehicle Steering and Suspension

ID	Title	Level	Credit
24434	Demonstrate knowledge of heavy machine and equipment suspension systems, and diagnosing system failure	3	3
24438	Demonstrate knowledge of tractor or machine wheel steering systems and fault diagnosis and repair procedures	3	2

ID	Title	Level	Credit
24564	Remove and replace steering and suspension components on motor vehicles or machines	3	3

Agricultural Equipment Elective

A minimum of 28 credits

Engineering and Technology > Motor Industry > 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

Engineering and Technology > Motor Industry > Automotive Electrical and Electronics

ID	Title	Level	Credit
235	Describe automotive ignition systems and their operation	2	4
24129	Create and measure automotive series-parallel circuits, and calculate values of power in automotive circuits	3	2

Engineering and Technology > Motor Industry > 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
24178	Demonstrate knowledge of exhaust systems on heavy vehicles and equipment	3	3

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
24445	Remove and replace automotive air conditioning components	3	2
24448	Demonstrate knowledge of servicing automotive air conditioning systems	3	2

Engineering and Technology > Motor Industry > Automotive Pneumatics

ID	Title	Level	Credit
2324	Repair and test heavy vehicle and/or equipment compressors and adjust their controls	3	4
2340	Demonstrate knowledge of pneumatic system principles and operation for heavy vehicles and equipment	3	6

Engineering and Technology > Motor Industry > Automotive Preventive Maintenance

ID	Title	Level	Credit
381	Store a vehicle or machine	3	3
24339	Carry out general service checks on all-terrain vehicles (ATVs)	3	2
24340	Carry out a pre-delivery check, rectify defects, and complete the service on an all-terrain vehicle (ATV)	3	3

Engineering and Technology > Motor Industry > 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 > Motor Industry > Automotive Transmission Systems

ID	Title	Level	Credit
2336	Diagnose and rectify heavy vehicle or equipment transmission fluid coupling faults	3	3

Engineering and Technology > Motor Industry > 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
24393	Heat metal automotive components to aid disassembly and assembly in the motor and related industries	2	2

Engineering and Technology > Motor Industry > Engines

ID	Title	Level	Credit
929	Test and rectify starting aid system faults on a diesel engine	3	2
2334	Remove an engine assembly from, and install the assembly in, a heavy vehicle	3	2
15441	Overhaul an engine cooling system water pump	3	3

ID	Title	Level	Credit
21687	Demonstrate knowledge of basic tuning on a four stroke petrol engine	2	3
24275	Disassemble, inspect, and reassemble an engine short block under general supervision	3	3
24290	Inspect and service auxiliary engines on heavy vehicles or equipment	3	3
24306	Carry out general repairs to an engine short block	3	3

Engineering and Technology > Motor Industry > Vehicle Braking Systems

ID	Title	Level	Credit
15476	Demonstrate knowledge of pneumatic brakes on heavy vehicles and machines	3	4
21689	Demonstrate knowledge of hydraulic brake fluid, fluid replacement, and brake bleeding procedures	2	2
24407	Demonstrate knowledge of brake lining friction materials	3	2
24410	Demonstrate knowledge of machining brake disc rotors and brake drums	3	1
24411	Machine brake disc rotors and brake drums	3	2
24418	Demonstrate knowledge of foundation (drum) brakes on heavy vehicles and machines	3	2
24419	Inspect and repair foundation (drum) brakes on heavy vehicles and machines	3	3
24420	Demonstrate knowledge of hydraulic brakes and testing hydraulic brakes on heavy vehicles or machines	3	2

Engineering and Technology > Motor Industry > 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

Materials Handling Equipment Strand

Meet the requirements of all of the following sets

- Materials Handling Equipment Compulsory
- Materials Handling Equipment Elective

Materials Handling Equipment Compulsory

The following standards are required

Engineering and Technology > Motor Industry > Automotive Electrical and Electronics

ID	Title	Level	Credit
235	Describe automotive ignition systems and their operation	2	4
24129	Create and measure automotive series-parallel circuits, and calculate values of power in automotive circuits	3	2
24130	Demonstrate knowledge of inductance, capacitors and chokes, and alternating current used in automotive applications	3	3
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
24136	Demonstrate knowledge of traction type batteries and their service requirements	3	2
24137	Service traction type batteries used on electric materials handling equipment	3	3
24145	Remove and replace a traction steering hydraulic controller on a forklift	3	2
24146	Adjust controller systems on materials handling equipment	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
894	Diagnose and rectify faults in a carburetted petrol fuel system	4	4
8183	Demonstrate knowledge of the operation, service checks, fault diagnosis, and repair of carburettors	3	6
21678	Remove, repair, and/or replace a vehicle and/or machine exhaust system	3	2
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 > Motor Industry > Automotive Hydraulics

ID	Title	Level	Credit
2314	Test and service hydraulic systems on equipment, vehicles, and/or machines	3	6

Engineering and Technology > Motor Industry > Automotive Preventive Maintenance

ID	Title	Level	Credit
24341	Carry out general service checks on non-electric forklifts and forklift attachments	3	4
24342	Carry out general service checks on electric forklifts and forklift attachments	3	4

Engineering and Technology > Motor Industry > Automotive Transmission Systems

ID	Title	Level	Credit
3385	Demonstrate knowledge of heavy machine manual and power shift transmissions	3	4

Engineering and Technology > Motor Industry > Engines

ID	Title	Level	Credit
3400	Check a four stroke petrol engine for condition using hand held test equipment	3	4
21687	Demonstrate knowledge of basic tuning on a four stroke petrol engine	2	3

Engineering and Technology > Motor Industry > Tractor and Machine Systems

ID	Title	Level	Credit
15471	Demonstrate knowledge of materials handling machine types, their applications, operation, and safety precautions	2	4
23939	Install and repair materials handling equipment attachments	3	4

Engineering and Technology > Motor Industry > Tyres

ID	Title	Level	Credit
24461	Demonstrate knowledge of heavy machine and equipment tyres and wheels	4	4

Engineering and Technology > Motor Industry > Vehicle Braking Systems

ID	Title	Level	Credit
24407	Demonstrate knowledge of brake lining friction materials	3	2
24418	Demonstrate knowledge of foundation (drum) brakes on heavy vehicles and machines	3	2
24419	Inspect and repair foundation (drum) brakes on heavy vehicles and machines	3	3

Engineering and Technology > Motor Industry > Vehicle Recovery

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

Engineering and Technology > Motor Industry > Vehicle Steering and Suspension

ID	Title	Level	Credit
16112	Demonstrate knowledge of heavy vehicle and machine power steering systems	3	4
24438	Demonstrate knowledge of tractor or machine wheel steering systems and fault diagnosis and repair procedures	3	2

Service Sector > Lifting Equipment > Powered Industrial Lift Trucks

ID	Title	Level	Credit
10851	Operate a powered industrial lift truck fitted with forks (forklift)	3	7
10852	Operate a powered industrial lift truck (PILT) fitted with attachments on a worksite	3	3

Materials Handling Equipment Elective

A minimum of 26 credits

Engineering and Technology > Mechanical Engineering > Maintenance and Diagnostics in Mechanical Engineering

ID	Title	Level	Credit
19873	Demonstrate knowledge of bearings used in machines and equipment	3	8

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
891	Diagnose and rectify faults in a contact breaker (CB) ignition system on an engine	4	2
5462	Demonstrate knowledge of automotive electronic ignition system operation	4	5
24092	Demonstrate knowledge of automotive lighting systems, and headlamp adjustment	3	2
24093	Rectify simple vehicle lighting faults, and adjust vehicle lamps	3	3

Engineering and Technology > Motor Industry > 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
5461	Demonstrate knowledge of fuel emissions, and vehicle emission controls	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
15373	Demonstrate knowledge of automotive air conditioning	3	4

Engineering and Technology > Motor Industry > Automotive Transmission Systems

ID	Title	Level	Credit
2318	Demonstrate knowledge of the construction and operation of heavy vehicle and equipment manual transmissions	3	4
2336	Diagnose and rectify heavy vehicle or equipment transmission fluid coupling faults	3	3
15418	Demonstrate knowledge of the operation and servicing requirements for heavy vehicle and equipment clutches	3	4
24319	Demonstrate knowledge of hydrostatic transmission drives, and testing and diagnosing faults, on plant or machinery	3	2
24331	Remove and replace heavy vehicle or equipment transmissions and clutches	3	3

Engineering and Technology > Motor Industry > 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

ID	Title	Level	Credit
24393	Heat metal automotive components to aid disassembly and assembly in the motor and related industries	2	2

Engineering and Technology > Motor Industry > Engines

ID	Title	Level	Credit
244	Disassemble and reassemble a four cylinder four stroke engine to a running state	2	6
929	Test and rectify starting aid system faults on a diesel engine	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
24302	Demonstrate knowledge of disassembling, inspecting, and reassembling an engine cylinder head	3	2
24807	Remove, disassemble, inspect, reassemble, and refit an engine cylinder head	3	4

Engineering and Technology > Motor Industry > Tyres

ID	Title	Level	Credit
24462	Check, remove, and refit wheels and tyres from heavy machines or equipment	4	10

Plant and Equipment Strand

Meet the requirements of all of the following sets

- Plant and Equipment Compulsory
- Plant and Equipment Elective

Plant and Equipment Compulsory

The following standards are required

Engineering and Technology > Mechanical Engineering > 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 > 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
898	Identify a wiring diagram and translate information to a circuit in the motor and related industries	3	3
915	Service multiple battery installations on vehicles, machines, and/or units	3	3
21675	Demonstrate knowledge of automotive batteries	2	2
24092	Demonstrate knowledge of automotive lighting systems, and headlamp adjustment	3	2

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

ID	Title	Level	Credit
21692	Perform minor servicing tasks on a diesel fuel system	2	2
24192	Repair heavy vehicle or machine exhaust systems	3	3

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

ID	Title	Level	Credit
15373	Demonstrate knowledge of automotive air conditioning	3	4

Engineering and Technology > Motor Industry > Automotive Hydraulics

ID	Title	Level	Credit
2314	Test and service hydraulic systems on equipment, vehicles, and/or machines	3	6

Engineering and Technology > Motor Industry > Automotive Pneumatics

ID	Title	Level	Credit
2340	Demonstrate knowledge of pneumatic system principles and operation for heavy vehicles and equipment	3	6

Engineering and Technology > Motor Industry > Automotive Preventive Maintenance

ID	Title	Level	Credit
2322	Carry out general service checks on heavy vehicles or equipment	3	4

Engineering and Technology > Motor Industry > Automotive Transmission Systems

ID	Title	Level	Credit
2319	Demonstrate knowledge of heavy vehicle and equipment automatic transmission operation	3	5
3385	Demonstrate knowledge of heavy machine manual and power shift transmissions	3	4

ID	Title	Level	Credit
24319	Demonstrate knowledge of hydrostatic transmission drives, and testing and diagnosing faults, on plant or machinery	3	2
24337	Demonstrate knowledge of automated manual transmissions (AMTs) and AMT shift control operation	3	1

Engineering and Technology > Motor Industry > Automotive Workshop Engineering

ID	Title	Level	Credit
21682	Demonstrate knowledge of an oxy-acetylene welding plant in the motor industry	2	2
21685	Use an oxy-acetylene welding plant in the motor industry	2	3
24393	Heat metal automotive components to aid disassembly and assembly in the motor and related industries	2	2

Engineering and Technology > Motor Industry > Engines

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
24302	Demonstrate knowledge of disassembling, inspecting, and reassembling an engine cylinder head	3	2
24807	Remove, disassemble, inspect, reassemble, and refit an engine cylinder head	3	4

Engineering and Technology > Motor Industry > Tyres

ID	Title	Level	Credit
24461	Demonstrate knowledge of heavy machine and equipment tyres and wheels	4	4

Engineering and Technology > Motor Industry > Vehicle Braking Systems

ID	Title	Level	Credit
21720	Demonstrate knowledge of vehicle braking systems	2	2
24407	Demonstrate knowledge of brake lining friction materials	3	2
24418	Demonstrate knowledge of foundation (drum) brakes on heavy vehicles and machines	3	2
24423	Inspect and repair heavy vehicle and equipment disc brakes	3	3

Engineering and Technology > Motor Industry > Vehicle Steering and Suspension

ID	Title	Level	Credit
16112	Demonstrate knowledge of heavy vehicle and machine power steering systems	3	4
24434	Demonstrate knowledge of heavy machine and equipment suspension systems, and diagnosing system failure	3	3

Plant and Equipment Elective

A minimum of 25 credits

Engineering and Technology > Motor Industry > Automotive Electrical and Electronics

ID	Title	Level	Credit
235	Describe automotive ignition systems and their operation	2	4
24093	Rectify simple vehicle lighting faults, and adjust vehicle lamps	3	3
24129	Create and measure automotive series-parallel circuits, and calculate values of power in automotive circuits	3	2

Engineering and Technology > Motor Industry > 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
19303	Demonstrate knowledge of unit type diesel fuel injectors	3	3
24178	Demonstrate knowledge of exhaust systems on heavy vehicles and equipment	3	3

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
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

Engineering and Technology > Motor Industry > Automotive Pneumatics

ID	Title	Level	Credit
2324	Repair and test heavy vehicle and/or equipment compressors and adjust their controls	3	4

Engineering and Technology > Motor Industry > Automotive Preventive Maintenance

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

Engineering and Technology > Motor Industry > Automotive Transmission Systems

ID	Title	Level	Credit
2318	Demonstrate knowledge of the construction and operation of heavy vehicle and equipment manual transmissions	3	4
2336	Diagnose and rectify heavy vehicle or equipment transmission fluid coupling faults	3	3
15418	Demonstrate knowledge of the operation and servicing requirements for heavy vehicle and equipment clutches	3	4
24321	Demonstrate knowledge of belt and chain drive systems on plant and machinery	3	2
24331	Remove and replace heavy vehicle or equipment transmissions and clutches	3	3

Engineering and Technology > Motor Industry > Automotive Workshop Engineering

ID	Title	Level	Credit
21683	Demonstrate knowledge of MIG welding 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
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 > Motor Industry > Engines

ID	Title	Level	Credit
929	Test and rectify starting aid system faults on a diesel engine	3	2
2334	Remove an engine assembly from, and install the assembly in, a heavy vehicle	3	2
15441	Overhaul an engine cooling system water pump	3	3
21687	Demonstrate knowledge of basic tuning on a four stroke petrol engine	2	3
24283	Demonstrate knowledge of diesel engine braking systems and exhaust braking systems, and diagnosing and rectifying faults	4	2

Engineering and Technology > Motor Industry > Vehicle Braking Systems

ID	Title	Level	Credit
242	Change the fluid and bleed a brake hydraulic system	2	2
15476	Demonstrate knowledge of pneumatic brakes on heavy vehicles and machines	3	4
24410	Demonstrate knowledge of machining brake disc rotors and brake drums	3	1
24416	Demonstrate knowledge of wheel tractor braking systems	3	3
24419	Inspect and repair foundation (drum) brakes on heavy vehicles and machines	3	3
24420	Demonstrate knowledge of hydraulic brakes and testing hydraulic brakes on heavy vehicles or machines	3	2
24421	Test and repair hydraulic brake system components on heavy vehicles or machines	4	3

Engineering and Technology > Motor Industry > Vehicle Recovery

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

Engineering and Technology > Motor Industry > Vehicle Steering and Suspension

ID	Title	Level	Credit
21721	Demonstrate knowledge of vehicle steering and suspension systems	2	2

Road Transport Strand

Meet the requirements of all of the following sets

- Road Transport Compulsory
- Road Transport Elective

Road Transport Compulsory

The following standards are required

Engineering and Technology > Mechanical Engineering > 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 > 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
898	Identify a wiring diagram and translate information to a circuit in the motor and related industries	3	3
915	Service multiple battery installations on vehicles, machines, and/or units	3	3
21675	Demonstrate knowledge of automotive batteries	2	2
24092	Demonstrate knowledge of automotive lighting systems, and headlamp adjustment	3	2
24093	Rectify simple vehicle lighting faults, and adjust vehicle lamps	3	3

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

ID	Title	Level	Credit
21692	Perform minor servicing tasks on a diesel fuel system	2	2
24178	Demonstrate knowledge of exhaust systems on heavy vehicles and equipment	3	3
24192	Repair heavy vehicle or machine exhaust systems	3	3

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

ID	Title	Level	Credit
15373	Demonstrate knowledge of automotive air conditioning	3	4

Engineering and Technology > Motor Industry > Automotive Pneumatics

ID	Title	Level	Credit
2324	Repair and test heavy vehicle and/or equipment compressors and adjust their controls	3	4
2340	Demonstrate knowledge of pneumatic system principles and operation for heavy vehicles and equipment	3	6

Engineering and Technology > Motor Industry > Automotive Preventive Maintenance

ID	Title	Level	Credit
2322	Carry out general service checks on heavy vehicles or equipment	3	4

Engineering and Technology > Motor Industry > Automotive Transmission Systems

ID	Title	Level	Credit
2318	Demonstrate knowledge of the construction and operation of heavy vehicle and equipment manual transmissions	3	4
2319	Demonstrate knowledge of heavy vehicle and equipment automatic transmission operation	3	5
15418	Demonstrate knowledge of the operation and servicing requirements for heavy vehicle and equipment clutches	3	4
24331	Remove and replace heavy vehicle or equipment transmissions and clutches	3	3
24337	Demonstrate knowledge of automated manual transmissions (AMTs) and AMT shift control operation	3	1

Engineering and Technology > Motor Industry > Automotive Workshop Engineering

ID	Title	Level	Credit
21682	Demonstrate knowledge of an oxy-acetylene welding plant in the motor industry	2	2
21685	Use an oxy-acetylene welding plant in the motor industry	2	3
24393	Heat metal automotive components to aid disassembly and assembly in the motor and related industries	2	2

Engineering and Technology > Motor Industry > Engines

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
24302	Demonstrate knowledge of disassembling, inspecting, and reassembling an engine cylinder head	3	2
24807	Remove, disassemble, inspect, reassemble, and refit an engine cylinder head	3	4

Engineering and Technology > Motor Industry > Tyres

ID	Title	Level	Credit
24463	Demonstrate knowledge of heavy vehicle tyres and wheels	3	4

Engineering and Technology > Motor Industry > Vehicle Braking Systems

ID	Title	Level	Credit
242	Change the fluid and bleed a brake hydraulic system	2	2
15476	Demonstrate knowledge of pneumatic brakes on heavy vehicles and machines	3	4

ID	Title	Level	Credit
15477	Demonstrate knowledge of braking systems on truck and trailer combinations	3	4
21720	Demonstrate knowledge of vehicle braking systems	2	2
24407	Demonstrate knowledge of brake lining friction materials	3	2
24418	Demonstrate knowledge of foundation (drum) brakes on heavy vehicles and machines	3	2
24419	Inspect and repair foundation (drum) brakes on heavy vehicles and machines	3	3
24423	Inspect and repair heavy vehicle and equipment disc brakes	3	3

Engineering and Technology > Motor Industry > Vehicle Recovery

ID	Title	Level	Credit
23941	Demonstrate knowledge of salvage and recovery procedures to recover heavy vehicles and on-road machines	3	3

Engineering and Technology > Motor Industry > Vehicle Steering and Suspension

ID	Title	Level	Credit
16112	Demonstrate knowledge of heavy vehicle and machine power steering systems	3	4
24432	Demonstrate knowledge of heavy vehicle suspension systems and identifying suspension failure	3	3
24564	Remove and replace steering and suspension components on motor vehicles or machines	3	3

Road Transport Elective

A minimum of 18 credits

Engineering and Technology > Motor Industry > Automotive Electrical and Electronics

ID	Title	Level	Credit
235	Describe automotive ignition systems and their operation	2	4
16114	Demonstrate knowledge of vehicle security systems and their installation	3	4
24129	Create and measure automotive series-parallel circuits, and calculate values of power in automotive circuits	3	2

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

ID	Title	Level	Credit
240	Demonstrate knowledge of petrol fuel systems	2	3

ID	Title	Level	Credit
917	Remove and replace a diesel fuel injection pump	3	2
19303	Demonstrate knowledge of unit type diesel fuel injectors	3	3

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
24445	Remove and replace automotive air conditioning components	3	2
24448	Demonstrate knowledge of servicing automotive air conditioning systems	3	2

Engineering and Technology > Motor Industry > Automotive Hydraulics

ID	Title	Level	Credit
2314	Test and service hydraulic systems on equipment, vehicles, and/or machines	3	6

Engineering and Technology > Motor Industry > Automotive Transmission Systems

ID	Title	Level	Credit
2336	Diagnose and rectify heavy vehicle or equipment transmission fluid coupling faults	3	3

Engineering and Technology > Motor Industry > Automotive Workshop Engineering

ID	Title	Level	Credit
21683	Demonstrate knowledge of MIG welding 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
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 > Motor Industry > Engines

ID	Title	Level	Credit
929	Test and rectify starting aid system faults on a diesel engine	3	2
2334	Remove an engine assembly from, and install the assembly in, a heavy vehicle	3	2
15441	Overhaul an engine cooling system water pump	3	3
24290	Inspect and service auxiliary engines on heavy vehicles or equipment	3	3

Engineering and Technology > Motor Industry > Vehicle Bodywork

ID	Title	Level	Credit
912	Remove, repair, and replace vehicle body interior components	3	3
22799	Demonstrate safety precautions on vehicles fitted with air bags and/or seatbelt pre-tensioners	3	1
22800	Describe safe working precautions on vehicles equipped with air bags and seatbelt pre-tensioners	3	2

Engineering and Technology > Motor Industry > Vehicle Braking Systems

ID	Title	Level	Credit
24406	Prepare and reline brake shoes in the automotive repair industry	3	2
24410	Demonstrate knowledge of machining brake disc rotors and brake drums	3	1
24420	Demonstrate knowledge of hydraulic brakes and testing hydraulic brakes on heavy vehicles or machines	3	2
24421	Test and repair hydraulic brake system components on heavy vehicles or machines	4	3

Engineering and Technology > Motor Industry > Vehicle Recovery

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

Previous version of the qualification

Version 2 was republished to include exemptions for unit standards 21667, 21707, 21858, 24077, and 24234.

This qualification and the National Certificate in Motor Industry (Automotive Heavy Engineering) (Level 4) with strands in Agricultural Equipment, Materials Handling Equipment, Plant and Equipment, and Road Transport [Ref: 1446] replaced the National Certificate in Motor Industry (Automotive Heavy Engineering) with strands in Agricultural Equipment, Plant and Equipment, and Road Transport [Ref: 0003].

People currently working towards the replaced qualification may either complete the requirements for that qualification or transfer their results to one or more of these qualifications.

The last date for entry to training programmes or courses for the replaced qualification is December 2016. The last date for assessment of the replaced qualification is 31 December 2020.

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

Differences between new and replaced qualifications

There are substantial differences between the new and replaced qualifications.

Changes to structure and content included: the new qualifications have core compulsory and core elective sections; Ref 1445 and Ref: 1446 have strands in Agricultural Equipment, Materials Handling Equipment, Plant and Equipment, and Road Transport with compulsory and elective sections in each strand; candidates must now complete a strand in Ref: 1445 before they may progress to the corresponding strand in Ref: 1446.

This qualification contains standards that replace or have been substituted for earlier 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 standards – see table below.

Credit for	Exempt from
226	21858
227	21670, 21671
228	21669, 21859
230	21682, 21685
232	21676, 21707
236	21686, 21717
237	21720, 21721
241	21677, 21692
242	24425
245	21680, 21716
391	934
392	21673, 21708
877	24092, 24093

Credit for	Exempt from
896	24564
899	24105, 24106
913	21685
914	23992
923	24807
925	24275, 24306
930	24179
931	23927, 23928
933	21678
937	24406, 24407
948	24410, 24411
950	24372, 24373
965	24269
2315	24432
2317	24283
2330	24434
2338	23941
2342	24319
2343	24321
2629	22799, 22800
3391	24269
3394	24192
3879	21670, 21671
3880	21669, 21859
3884	21683
3885	21682, 21685
5437	24416
5440	24459, 24460

Credit for	Exempt from
5443	24438
5464	24129, 24130, 24131, 24132
5739	21673, 21708
5754	21678
5757	24105
5767	23743
5771	23992
8187	24131, 24132
11738	21678
11741	24462
11742	24461, 24462
15375	24131
15376	24131
15379	24136, 24137
15404	24178, 24179, 24180
15440	24807
15475	24407, 24418, 24419
15478	24420, 24421
15480	24422, 24423
15481	23941
15657	24564
16097	21718
16098	21858

Other standard setting bodies whose standards are included in the qualification

Competenz
 NZQA
 Primary Industry Training Organisation

Certification

This certificate will display the logos of NZQA, the NZ Motor Industry Training Organisation Inc and the accredited organisation.

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.