

**FIELD                    ENGINEERING AND TECHNOLOGY****Review of *Motor Industry* unit standards**

<b>Subfield</b>	<b>Domain</b>	<b>Id</b>
Motor Industry	Automotive Electrical and Electronics	877, 887-891, 895, 897-899, 904, 905, 907, 909, 910, 961, 975, 976, 978, 979, 2326, 2339, 2348, 3396, 3399, 5456-5458, 5462-5464, 5742, 5757, 8182, 8187, 15374-15379, 16114, 16115
	Automotive Fuel Systems and Exhaust	892, 5459, 5460

The NZ Motor Industry Training Organisation (Inc) (MITO) has completed the review of the unit standards listed above.

**Date new versions published**

**January 2008**

**Planned review date**

**December 2012**

**Summary of review and consultation process**

This review is part of a major review of the Motor Industry and Outdoor Fabric Product qualifications (QReview) being conducted by MITO. The Qreview Steering Group endorsed these standards after major consultation was carried out covering a wide range of stakeholders through focus group meetings and followed by industry wide consultation. These standards will form part of the new qualifications for Vehicle Servicing, Automotive Electrical and Mechanical, Automotive Heavy Engineering, Automotive Specialist Engineering, and Automotive Body.

**Main changes resulting from the review**

- Credits decreased from 6 to 4 in standard 15377, and the level increased from 3 to 4 in standards 891, 895, 897, and 15378, to more accurately reflect the learning requirements.
- Standards 877, 887, 899, 904, 910, 979, 2339, 3396, 3399, 5757, 8187, 15375, 15376, and 15379 were replaced by new standards that separate theory knowledge from practical outcomes.
- Standards 892, 961, and 5460 were collectively replaced by 24090 and 24091 for a more logical split of theory knowledge and practical outcomes.
- Standards 889 and 5457 had very similar outcomes and were replaced by one standard, 24654.
- Standards 2348, 5463, and 8182 were collectively replaced by standards 24119-24124 for a more logical split of theory knowledge and practical outcomes and to more accurately reflect vehicle electronic system groupings.
- Standard 5464 was split and replaced by 24129-24132 for more manageable assessment as not all parts of 5464 applied to all industry sectors.
- Standard 16115 was split and replaced by 24138 and 24139 to separate immobilisers and aftermarket security systems.
- Changes were made throughout the standards to titles, special notes, elements, performance criteria and range statements to update terminology, and reflect changes in technology and legislative requirements.

- Twelve new standards were developed, 24140-24151, to reflect new technology and fill gaps in the existing framework of standards.

**Unit standards categorised as category C expire at the end of December 2011.**

### Impact on existing provider accreditations

Current Accreditation for			Accreditation extended to		
Nature of accreditation	Classification or Id	Level	Nature of accreditation	Classification or Id	Level
Subfield	Motor Industry	3	Standards	891, 895, 897, 15378	4
Domain	Automotive Electrical and Electronics	3	Standards	891, 895, 897, 15378	4
Standard	877	3	Standards	24092, 24093	3
Standard	887	4	Standards	24094, 24095	4
Standard	892	4	Standards	24090, 24091	4
Standard	899	3	Standards	24105, 24106	3
Standard	961	4	Standards	24090, 24091	4
Standard	5463	4	Standards	24119, 24121, 24122, 24123, 24124	4
Standard	5464	3	Standards	24129, 24130, 24131, 24132	3
Standard	5757	3	Standards	24105, 24133	3
Standard	8182	4	Standards	24120	4
Standard	8187	3	Standards	24131, 24132	3
Standard	15379	3	Standards	24136, 24137	3

### Impact on Accreditation and Moderation Action Plan (AMAP)

AMAP 0014 was updated to reflect the changes made to the standards.

### Impact on existing qualifications

Qualifications that contain the reviewed standards or classifications are tabled below.

<b>Affected</b>	The qualification lists a reviewed classification (domain or subfield) in an elective set The qualification lists a standard that has changes to level or credits The qualification lists a C or D category standard
<b>Not materially affected</b>	The qualification lists a standard that has a new title The qualification lists a standard that has a new classification

The following MITO qualifications are impacted by the outcome of this review, with the items that generated the affected status in **bold**. These qualifications will be updated as part of the current QReview.

Qualification title	Classification or standard in the qualification
National Certificate in Motor Industry (Advanced Technical) (Level 5) with strands in Automotive Electrical and Mechanical, and Collision Repair [Ref: 1143]	<b>979, 15375</b>
National Certificate in Motor Industry (Automotive Air Conditioning) [Ref: 0002]	898, <b>899</b> , 907, 909, <b>910, 5463, 8182</b>

Qualification title	Classification or standard in the qualification
National Certificate in Motor Industry (Automotive Electrical Engineering) [Ref: 0137]	<b>887</b> , 888, 890, <b>891</b> , <b>895</b> , <b>897</b> , 898, <b>899</b> , <b>904</b> , 905, 907, 909, <b>910</b> , <b>979</b> , 2326, <b>2339</b> , <b>2348</b> , <b>3399</b> , 5456, <b>5457</b> , 5458, <b>5460</b> , 5462, <b>5463</b> , <b>5464</b> , <b>8182</b> , 15374, <b>15375</b> , <b>15379</b> , <b>16115</b>
National Certificate in Motor Industry (Automotive Engineering) [Ref: 0019]	<b>877</b> , <b>892</b> , 898, <b>899</b> , <b>961</b> , 5462, <b>5463</b> , <b>8182</b> , <b>8187</b>
National Certificate in Motor Industry (Automotive Heavy Engineering) with strands in Agricultural Equipment, Plant and Equipment, and Road Transport [Ref: 0003]	<b>877</b> , <b>887</b> , 898, <b>899</b> , <b>3396</b> , <b>5463</b> , <b>8182</b> , <b>15375</b>
National Certificate in Motor Industry (Automotive Servicing) [Ref: 0138]	898
National Certificate in Motor Industry (Automotive Steering, Suspension, and Alignment) with an optional strand in Heavy Commercial Vehicles [Ref: 0246]	<b>5463</b>
National Certificate in Motor Industry (Brake Service Engineering) [Ref: 0096]	898, <b>899</b>
National Certificate in Motor Industry (Coachbuilding) with strands in Passenger Service Vehicles, Commercial Vehicles, and Motor Homes and Caravans [Ref: 0413]	898, <b>899</b> , 909, 5742
National Certificate in Motor Industry (Diesel Fuel Injection Engineering) [Ref: 0139]	898
National Certificate in Motor Industry (Motorcycle Engineering) [Ref: 0015]	<b>877</b> , 890, <b>892</b> , 898, <b>899</b> , 909, <b>979</b> , <b>8187</b> , <b>15376</b> , <b>15377</b> , <b>15378</b>
National Certificate in Motor Industry (Outdoor Power Equipment Servicing) [Ref: 0697]	898, <b>899</b> , <b>979</b> , 15374
National Certificate in Motor Industry (Panelbeating) [Ref: 0179]	5742, <b>5757</b>
National Certificate in Motor Industry (Trailer Boat Systems Engineering) (Level 3) [Ref: 0698]	898, <b>899</b> , 5459, 5462
National Certificate in Motor Industry (Trailer Boat Systems Engineering) (Level 4) [Ref: 0699]	<b>892</b>

## Review Categories and changes to classification, title, level and credits

All changes are in **bold**.

### Key to review category

- A** Dates changed, but no other changes are made - the new version of the standard carries the same Id and a new version number
- B** Changes made, but the overall outcome remains the same - the new version of the standard carries the same Id and a new version number
- C** Major changes that necessitate the registration of a replacement standard with a new Id
- D** Standard will expire and not be replaced

Subfield		Motor Industry			
Id	Domain	Title	Level	Credit	Review Category
892	Automotive Fuel Systems and Exhaust	Test, diagnose, and rectify faults in an electronic fuel injection (EFI) system on an engine	4	4	C
961	Automotive Electrical and Electronics	Diagnose and rectify faults in engine management systems	4	8	C
and 5460	Automotive Fuel Systems and Exhaust	Test and repair automotive electronic fuel injection systems	4	4	C
<b>24090</b>	<b>Automotive Electrical and Electronics</b>	<b>Demonstrate knowledge of diagnosing faults in engine management systems</b>	<b>3</b>	<b>1</b>	
<b>and 24091</b>	<b>Automotive Electrical and Electronics</b>	<b>Inspect, diagnose, and rectify faults in engine management systems</b>	<b>4</b>	<b>6</b>	

Domain		Automotive Electrical and Electronics			
Id	Title	Level	Credit	Review Category	
877	Identify functions of automotive lighting systems, rectify lighting faults, and adjust vehicle lamps	3	5	C	
<b>24092 and 24093</b>	<b>Demonstrate knowledge of automotive lighting systems, and headlamp adjustment</b>	<b>3</b>	<b>2</b>		
	<b>Rectify simple vehicle lighting faults, and adjust vehicle lamps</b>	<b>3</b>	<b>3</b>		
887	Diagnose and repair automotive wiper system faults	4	2	C	
<b>24094 and 24095</b>	<b>Demonstrate knowledge of windscreen wiper and headlamp cleaning systems</b>	<b>3</b>	<b>1</b>		
	<b>Test for and rectify automotive wiper system faults</b>	<b>4</b>	<b>2</b>		
888	Overhaul a starter motor from a car and/or light commercial vehicle	3	3	B	
	<b>Overhaul starter motors from light vehicles</b>				
889	Repair an automotive alternator	3	3	C	
5457	Test and repair automotive alternator circuits	4	4	C	
<b>24654</b>	<b>Test and rectify faults in automotive alternator circuits, and overhaul an automotive alternator</b>	<b>3</b>	<b>4</b>		

Id	Title	Level	Credit	Review Category
890	Diagnose and repair faults in electrical starting and charging systems on motorcycles <b>Diagnose and rectify faults in motorcycle or ATV electrical starting and charging systems, and overhaul starter motors</b>	4	4	B
891	Test, diagnose, and rectify faults in a contact breaker (CB) ignition system on an engine <b>Diagnose and rectify faults in a contact breaker (CB) ignition system on an engine</b>	3 4	2	B
895	Test, diagnose, and rectify faults in a conventional type electronic ignition system on an engine <b>Diagnose and rectify faults in a conventional-type electronic ignition system on an engine</b>	3 4	4	B
897	Diagnose and repair faults in starting and charging systems on cars or light commercial vehicles <b>Diagnose and rectify faults in light vehicle starting and charging systems</b>	3 4	5	B
898	Identify an automotive wiring diagram and translate information to a motor vehicle circuit <b>Identify a wiring diagram and translate information to a circuit in the motor and related industries</b>	3	3	B
899 24105 <sup>1</sup> and 24106	Carry out automotive wiring repairs and test circuits for serviceability <b>Demonstrate knowledge of wiring and wiring diagrams used in automotive circuits</b> Carry out automotive wiring repairs and replace a wiring circuit	3 3 3	3 2 2	C
904 24107 and 24108	Diagnose faults in an automotive generator type charging system, and overhaul a DC generator <b>Demonstrate knowledge of an automotive charging system that uses a direct current (dc) generator</b> Test for and rectify faults in an automotive direct current (dc) type generator charging system	3 3 3	5 2 4	C
905	Overhaul an electric starter motor from a heavy commercial vehicle <b>Overhaul heavy duty electric pre-engaged and axial-type starter motors</b>	4	5	B
907	Install audio entertainment systems in vehicles, repair installation faults, and replace components <b>Install entertainment systems in vehicles, test and rectify installation faults, and replace components</b>	4	4	B

<sup>1</sup> This unit standard and unit standard 24106 replaced unit standard 899. This unit standard and unit standard 24133 replaced unit standard 5757.

Id	Title	Level	Credit	Review Category
909	Install, repair, and replace electrical accessories in vehicles <b>Install electrical accessories in vehicles, and test for and rectify faults</b>	3	2	B
910 <b>24113</b> <b>and</b> <b>24114</b>	Diagnose and rectify faults in automotive instruments and gauges <b>Demonstrate knowledge of automotive instruments and gauges, and testing and rectifying system faults</b> <b>Test for and rectify faults in automotive instruments and gauges</b>	4 4 4	5 2 4	C
975	Design a wiring harness for a particular automotive application	4	4	B
976	Specify the lighting requirements for a passenger coach or special purpose vehicle	5	4	B
978	Specify the battery and charging system requirements for a passenger coach or special purpose vehicle	5	4	B
979 <b>24115</b> <b>and</b> <b>24116</b>	Diagnose and rectify faults in an engine flywheel ignition system <b>Diagnose and rectify faults in an engine flywheel ignition system</b> <b>Demonstrate knowledge of contact breaker and capacitor discharge ignition systems used on motorcycles and small engines</b>	4 3 3	5 3 2	C
2326	Inspect and test an ignition distributor, and rectify faults <b>Overhaul an ignition distributor</b>	3	2	B
2339 <b>24117</b> <b>and</b> <b>24118</b>	Describe direct current electric motors used in forklifts, and repair speed control systems <b>Demonstrate knowledge of direct and alternating current electric motors used in forklifts and their repair procedures</b> <b>Prepare to and rectify faults in forklift direct or alternating current electric motors and speed control systems</b>	4 4 4	6 3 5	C

Id	Title	Level	Credit	Review Category
2348 and 5463	Diagnose and rectify faults in vehicle and machine body electronics	4	8	C
	Explain the operation and repair requirements of automotive electronic control systems	4	8	C
<b>24119</b>	<b>Demonstrate knowledge of vehicle steering and suspension electronic control systems, and testing and rectifying faults</b>	4	3	
<b>24121</b>	<b>Demonstrate knowledge of vehicle body electronic control safety systems, and testing and rectifying faults</b>	4	3	
<b>24122</b>	<b>Demonstrate knowledge of vehicle body electronic control security systems, and testing and rectifying faults</b>	4	3	
<b>24123</b>	<b>Demonstrate knowledge of vehicle comfort and entertainment electronic control systems, and testing and rectifying faults</b>	4	3	
<b>and 24124</b>	<b>Demonstrate knowledge of vehicle powertrain electronic control systems, and testing and rectifying faults</b>	4	3	
2348 and 8182	Diagnose and rectify faults in vehicle and machine body electronics	4	8	C
	Diagnose and rectify faults in automotive electronically controlled systems	4	6	C
<b>24120</b>	<b>Test for and rectify faults in vehicle mechanical and body electronic control systems</b>	4	10	
3396	Diagnose and rectify faults in heavy vehicle and/or machine electrical starting and charging systems	4	8	C
<b>24125</b>	<b>Demonstrate knowledge of testing heavy vehicle or machine electrical starting and charging systems</b>	4	2	
<b>and 24126</b>	<b>Diagnose and rectify faults in heavy vehicle or machine electrical starting and charging systems</b>	4	5	
3399	Demonstrate knowledge of vehicle lighting and rectify lighting circuit faults	4	5	C
<b>24127 and 24128</b>	<b>Demonstrate knowledge of automotive lighting requirements and lighting circuit diagnosis</b>	4	3	
	<b>Diagnose and rectify lighting circuit faults on vehicles or machines</b>	4	4	
5456	Explain the operation of automotive alternators and alternator controls <b>Demonstrate knowledge of the operation and testing of automotive alternators and alternator controls</b>	3	4	B
5458	Explain the operation of heavy duty starter motors <b>Demonstrate knowledge of heavy duty starter motor operation</b>	4	4	B

Id	Title	Level	Credit	Review Category
5462	Explain the operation of automotive electronic ignition systems <b>Demonstrate knowledge of automotive electronic ignition system operation</b>	4	5	B
5464 24129 24130 24131 <sup>2</sup> and 24132 <sup>3</sup>	Explain automotive electrical and electronic applications <b>Create and measure automotive series-parallel circuits, and calculate values of power in automotive circuits</b> <b>Demonstrate knowledge of inductance, capacitors and chokes, and alternating current used in automotive applications</b> <b>Demonstrate knowledge of electronic components and their application in the automotive industry</b> <b>Demonstrate knowledge of integrated electronic devices, multiplexing, and microprocessors in the motor industry</b>	3 3 3 3 3	12 2 3 5 4	C
5742	Protect electronics when repairing a vehicle in the motor industry <b>Protect electronics when servicing or repairing a vehicle or machine in the motor industry</b>	3	2	B
5757 24133 and 24105 <sup>1</sup>	Remove and replace damaged vehicle wiring <b>Identify, remove and replace a vehicle or machine wiring harness sub-assembly</b> <b>Demonstrate knowledge of wiring and wiring diagrams used in automotive circuits</b>	3 3 3	3 2 2	C
8187 24131 <sup>2</sup> and 24132 <sup>3</sup>	Describe electronic components and circuitry for automotive engineering requirements <b>Demonstrate knowledge of electronic components and their application in the automotive industry</b> <b>Demonstrate knowledge of integrated electronic devices, multiplexing, and microprocessors in the motor industry</b>	3 3 3	8 5 4	C
15374	Diagnose and repair faults in electrical starting and charging systems on outdoor powered equipment <b>Diagnose and rectify faults in starting and charging systems, and overhaul starter motors on outdoor powered equipment</b>	4	4	B

<sup>2</sup> This unit standard, unit standard 24129, unit standard 24130, and unit standard 24132 replaced unit standard 5464. This unit standard and unit standard 24132 replaced unit standard 8187. This unit standard and unit standard 24134 replaced unit standard 15375. This unit standard and unit standard 24135 replaced unit standard 15376.

<sup>3</sup> This unit standard, unit standard 24129, unit standard 24130, and unit standard 24131 replaced unit standard 5464. This unit standard and unit standard 24131 replaced unit standard 8187.

Id	Title	Level	Credit	Review Category
15375	Diagnose and repair faults in electronically controlled systems used on heavy vehicles and machines	4	8	C
<b>24131<sup>2</sup></b>	<b>Demonstrate knowledge of electronic components and their application in the automotive industry</b>	<b>3</b>	<b>5</b>	
<b>and 24134</b>	<b>Test for and rectify faults in electronically controlled systems used on heavy vehicles or machines</b>	<b>4</b>	<b>5</b>	
15376	Diagnose and repair faults in electronically controlled systems used on motorcycles	4	5	C
<b>24131<sup>2</sup></b>	<b>Demonstrate knowledge of electronic components and their application in the automotive industry</b>	<b>3</b>	<b>5</b>	
<b>and 24135</b>	<b>Test for and rectify faults in electronically controlled systems used on motorcycles</b>	<b>4</b>	<b>3</b>	
15377	Test, diagnose, and rectify faults in a motorcycle electronic ignition system <b>Diagnose and rectify faults in a motorcycle electronic ignition system</b>	4	6 4	B
15378	Test and rectify faults in a motorcycle contact breaker battery ignition system <b>Diagnose and rectify faults in a motorcycle contact breaker battery ignition system</b>	3 4	4	B
15379	Demonstrate knowledge of, and service traction batteries on electric forklifts	3	3	C
<b>24136</b>	<b>Demonstrate knowledge of traction type batteries and their service requirements</b>	<b>3</b>	<b>2</b>	
<b>and 24137</b>	<b>Service traction type batteries used on electric materials handling equipment</b>	<b>3</b>	<b>3</b>	
16114	Demonstrate knowledge of vehicle security systems and their installation	3	4	B
16115	Install a security system in a vehicle	4	4	C
<b>24138</b>	<b>Install an immobiliser system in a vehicle</b>	<b>3</b>	<b>2</b>	
<b>and 24139</b>	<b>Install an aftermarket vehicle or machine body control security system</b>	<b>4</b>	<b>4</b>	
<b>24140</b>	<b>Demonstrate knowledge of the principles of motorcycle electronic control system operation and repair</b>	<b>4</b>	<b>6</b>	<b>New</b>
<b>24141</b>	<b>Demonstrate knowledge of vehicle ABS, TCS, and ESC electronic control systems, and testing and rectifying faults</b>	<b>5</b>	<b>3</b>	<b>New</b>
<b>24142</b>	<b>Test and rectify faults in vehicle ABS, TCS, or ESC electronic control systems</b>	<b>5</b>	<b>6</b>	<b>New</b>
<b>24143</b>	<b>Demonstrate knowledge of starting and charging systems and fault diagnosis on motorcycles or all-terrain vehicles (ATVs)</b>	<b>3</b>	<b>3</b>	<b>New</b>

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>	<b>Review Category</b>
24144	<b>Demonstrate knowledge of testing for and rectifying faults on a motorcycle electronic ignition system</b>	4	2	New
24145	<b>Remove and replace a traction steering hydraulic controller on a forklift</b>	3	2	New
24146	<b>Adjust controller systems on materials handling equipment</b>	3	4	New
24147	<b>Inspect components, test equipment for condition, and rectify equipment faults in battery powered forklifts</b>	4	6	New
24148	<b>Demonstrate knowledge of engine management systems</b>	3	3	New
24149	<b>Demonstrate knowledge of overhauling starter motors from light vehicles</b>	3	2	New
24150	<b>Demonstrate knowledge of overhauling automotive alternators</b>	3	2	New
24151	<b>Demonstrate knowledge of automotive oscilloscopes</b>	4	2	New

Domain Automotive Fuel Systems and Exhaust

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>	<b>Review Category</b>
5459	Explain the operation of automotive electronic fuel injection systems <b>Demonstrate knowledge of automotive electronic fuel injection system operation, and fault diagnosis and repair</b>	3	4	B