

**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	915
	Automotive Hydraulics	931, 2314, 15410
	Automotive Pneumatics	990, 2324, 2340
	Automotive Trailers	941, 2341, 15414
	Engine Repairs	15439
	Power Boat Systems	5433, 5436, 15450-15469
	Tractor and Machine Body Systems	5438, 5439, 15470, 15471
	Vehicle Recovery	2337, 2338, 3387-3389, 15481

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

**Date new versions published**

**September 2007**

**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 have increased from 2 to 3 in standard 915, from 4 to 6 in standard 15464, and decreased from 4 to 3 in standard 15465, and from 15 to 12 in 15410, to more accurately reflect the learning requirements.
- The Level has decreased from 4 to 3 in 2314, from 4 to 3 in standard 15451, from 5 to 4 in standard 15461, and from 5 to 4 in standard 15469.
- Standards 931, 941, 2341, 3388, 5439, 15414, and 15452 have each been replaced by two new standards to separate theory knowledge from practical outcomes.
- Standards 2338 and 15481 have been replaced by two new standards 23941 and 23942 to separate theory knowledge from practical outcomes.
- Standard 15470 has been replaced by standard 23958 as there have been significant changes to the content.
- The *Power Boat Systems* domain has been designated lapsing and the standards have been reclassified to the new *Trailer Boat Systems* domain, with the exception of standards 5433 and 5436 which have been reclassified to the *Automotive Electrical and Electronics* domain. The *Tractor and Machine Body Systems* domain has been designated lapsing and the standards have been reclassified to the new *Tractor and Machine Systems* domain, with the exception of standard 15470 which has been reclassified to the *Automotive Preventive Maintenance* domain.

- Changes have been 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.
- Standards 2337, 3389, 15453, and 15457 have been designated expiring and will not be replaced as they no longer meet industry needs.
- Two new standards, 23939 and 23940, have been developed to reflect new technology and fill gaps in the existing framework of standards.

**Unit standards categorised as category C or D 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
Domain	Engine Repairs	3	Domain	Engines	3
Domain	Tractor and Machine Body Systems	2	Domain	Tractor and Machine Systems	2
Domain	Vehicle Recovery	3	Standard	23942	4
Standard	941	3	Standards	23929, 23930	3

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

AMAP 0014 has been 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	Standard in the qualification
National Certificate in Motor Industry (Automotive Electrical Engineering) [Ref: 0137]	<b>915</b> , 3387, 5433, 5436, <b>15453</b>
National Certificate in Motor Industry (Automotive Heavy Engineering) with strands in Agricultural Equipment, Plant and Equipment, and Road Transport [Ref: 0003]	<b>915</b> , <b>931</b> , 990, <b>2314</b> , 2324, <b>2338</b> , 2340, <b>2341</b> , 3387, <b>3389</b> , 5438, <b>5439</b> , <b>15410</b> , <b>15481</b>
National Certificate in Motor Industry (Automotive Machining) [Ref: 0371]	2324
National Certificate in Motor Industry (Brake Service Engineering) [Ref: 0096]	3387
National Certificate in Motor Industry (Diesel Fuel Injection Engineering) [Ref: 0139]	3387
National Certificate in Motor Industry (Motorcycle Engineering) [Ref: 0015]	3387

Qualification title	Standard in the qualification
National Certificate in Motor Industry (Trailer Boat Systems Engineering) (Level 3) [Ref: 0698]	<b>915</b> , 5433, <b>15414</b> , 15439, 15450, 15454-16456, <b>15457</b> , 15458, 15459, 15467
National Certificate in Motor Industry (Trailer Boat Systems Engineering) (Level 4) [Ref: 0699]	5436, <b>15451-15453</b> , 15460, <b>15461</b> , 15462, 15463, <b>15464</b> , <b>15465</b> , 15466, 15468, <b>15469</b>

The following qualifications are also impacted by the outcome of this review, with the items that generated the affected status in **bold**. The standard setting bodies (SSBs) have been advised that they require revision.

Qualification title	Classification or standard in the qualification	SSB Name
National Certificate in Adventure Tourism (Level 4) [Ref: 1099]	<b>Power Boat Systems</b>	Aviation, Tourism and Travel Training Organisation
National Certificate in Boatbuilding (Level 4) with strands in Marine Cabinetmaking, Composite Sparmaking, Alloy Boatbuilding, Marine Rigging, Marine Painting, Composite Boatbuilding, Steel Boatbuilding, Wooden Boatbuilding, Marine Systems Engineering, Metal Sparmaking, Composite Production Trailer Boats, and Alloy Production Trailer Boats [Ref: 0877]	5433	Boating Industry Training Organisation
National Certificate in Boatbuilding (Marine Electrical and Electronic Installation) (Level 3) [Ref: 0930]	5433	Boating Industry Training Organisation

### 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  
Domain Automotive Electrical and Electronics

Id	Title	Level	Credit	Review Category
915	Service multiple battery installations on heavy commercial vehicles, machines, or units <b>Service multiple battery installations on vehicles, machines, and/or units</b>	3	2 <b>3</b>	B

## Domain Automotive Hydraulics

Id	Title	Level	Credit	Review Category
931	Describe the application of hydraulics for automotive heavy engineering use	4	8	C
<b>23927</b> and <b>23928</b>	<b>Demonstrate knowledge of automotive hydraulic principles, practices, systems and components</b>	<b>3</b>	<b>4</b>	
	<b>Demonstrate knowledge of automotive hydraulic circuit diagrams and oil requirements</b>	<b>3</b>	<b>3</b>	
2314	Test, service and repair faults in hydraulic systems on heavy equipment, vehicles, and machines	4	6	B
	<b>Test and service hydraulic systems on equipment, vehicles, and/or machines</b>	<b>3</b>		
15410	Test and repair hydraulic equipment components on heavy equipment, vehicles, and machines	4	15 12	B

## Domain Automotive Pneumatics

Id	Title	Level	Credit	Review Category
990	Repair an air operated engine starting system	4	3	B
	<b>Test and repair an air operated engine starting system</b>			
2324	Repair and test heavy vehicle and/or equipment compressors and adjust their controls	3	4	B
2340	Describe the operation of pneumatic systems for heavy vehicle and equipment use	3	6	B
	<b>Demonstrate knowledge of pneumatic system principles and operation for heavy vehicles and equipment</b>			

## Domain Automotive Trailers

Id	Title	Level	Credit	Review Category
941	Describe light trailer servicing requirements, and repair light trailers	3	2	C
<b>23929</b> and <b>23930</b>	<b>Repair light trailers in the motor and related industries</b>	<b>3</b>	<b>2</b>	
	<b>Demonstrate knowledge of light trailer servicing requirements</b>	<b>3</b>	<b>2</b>	
2341	Describe heavy trailer systems, and maintain and repair heavy trailers and semi-trailers	4	15	C
<b>23931</b> and <b>23932</b>	<b>Demonstrate knowledge of heavy trailer systems</b>	<b>4</b>	<b>2</b>	
	<b>Maintain and repair heavy trailers and semi-trailers</b>	<b>4</b>	<b>13</b>	

Id	Title	Level	Credit	Review Category
15414	Maintain and repair a power boat trailer	4	4	C
<b>23933</b>	<b>Demonstrate knowledge of servicing requirements for boat trailer systems and controls</b>	<b>3</b>	<b>2</b>	
<b>23934</b>	<b>Inspect, maintain, and repair a boat trailer</b>	<b>3</b>	<b>3</b>	

Domain Engine Repairs

Domain Engines

Id	Title	Level	Credit	Review Category
15439	Demonstrate knowledge of open and closed cooling systems on power boats <b>Demonstrate knowledge of the operation and servicing of open and closed cooling systems on trailer boats</b>	3	4	B

Domain Power Boat Systems \*

Domain Automotive Electrical and Electronics

Id	Title	Level	Credit	Review Category
5433	Describe the application of electricity and electronics for marine use <b>Demonstrate knowledge of electrical and electronic applications for marine use</b>	3 4	8	B
5436	Diagnose and rectify faults in marine starting and charging systems <b>Diagnose and rectify faults in marine charging and starting systems</b>	4	4	

\* indicates domain split into two tables to indicate classification changes more clearly.

Domain Power Boat Systems \*

Domain Trailer Boat Systems

Id	Title	Level	Credit	Review Category
15450	Carry out a maintenance check and complete a pre-season service on a power boat <b>Check and service trailer boat systems and controls</b>	3	4	B
15451	Identify the construction and layout requirements of power boats <b>Demonstrate knowledge of the construction and rigging requirements of trailer boats</b>	4 3	10	
15452	Carry out basic marine fibreglass repairs	4	4	C
<b>23935</b>	<b>Demonstrate knowledge of glass reinforced plastic (GRP) and its repair methods for trailer boat hulls</b>	<b>3</b>	<b>2</b>	
<b>23936</b>	<b>Carry out basic glass reinforced plastic (GRP) repairs to a trailer boat hull</b>	<b>4</b>	<b>3</b>	

Id	Title	Level	Credit	Review Category
15453	Install, test, and repair or replace electrical accessories on power boats	4	6	D
15454	Describe power boat propeller operation, types, servicing, and installation procedures <b>Demonstrate knowledge of trailer boat propeller operation, types, servicing, and installation procedures</b>	3	4	B
15455	Describe hydraulic type marine transmission operation and repair procedures <b>Demonstrate knowledge of marine hydraulic transmission operation and servicing requirements</b>	3	4	B
15456	Demonstrate knowledge of a stern drive type marine transmission <b>Demonstrate knowledge of stern drive transmissions and servicing requirements</b>	3	4	B
15457	Demonstrate knowledge of saildrive (S drive) transmission units, and repair them	3	4	D
15458	Identify the operation and servicing of power boat impeller propulsion systems (water jet units) <b>Demonstrate knowledge of trailer boat impeller propulsion systems (water jet units) and servicing requirements</b>	3	4	B
15459	Identify the operation and servicing requirements of surface piercing drive units fitted to boats <b>Demonstrate knowledge of trailer boat surface piercing drive units and servicing requirements</b>	3	2	B
15460	Inspect and repair power boat inboard driveline components <b>Inspect and repair trailer boat inboard driveline components</b>	4	4	B
15461	Plan basic equipment layout on a power boat, and install equipment <b>Plan basic equipment layout and rig a trailer boat</b>	5 4	15	B
15462	Inspect, test, and rectify inboard engine cooling system faults on a power boat <b>Inspect, test, and rectify inboard engine cooling system faults on a trailer boat</b>	4	4	B
15463	Carry out a sea trial for a power boat <b>Carry out a sea trial for a trailer boat</b>	4	4	B
15464	Check and arrange the restoration of previously submerged boats, engines, systems, and components <b>Check and arrange the restoration of previously submerged marine engines, systems, and/or components</b>	5	4 6	B

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>	<b>Review Category</b>
15465	Check, determine the suitability, and repair a propeller for a power boat <b>Check and determine the suitability of a propeller for a trailer boat</b>	4	4 3	B
15466	Test, inspect, and service a power boat impeller propulsion system (water jet unit) <b>Inspect, test, and repair a trailer boat impeller propulsion system (water jet unit)</b>	4	3	B
15467	Describe the construction, layout, and servicing requirements of power boat drive trains <b>Demonstrate knowledge of the layout and servicing requirements of trailer boat drive trains</b>	3	6	B
15468	Inspect and repair a hydraulic type marine transmission <b>Inspect and repair a hydraulic marine transmission</b>	4	6	B
15469	Inspect and rebuild power boat stern legs <b>Inspect and rebuild trailer boat stern legs</b>	5 4	8	B

\* indicates domain split into two tables to indicate classification changes more clearly.

Domain Tractor and Machine Body Systems \*  
Domain **Automotive Preventive Maintenance**

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>	<b>Review Category</b>
15470	Inspect and repair forklift mast and carriage	4	6	C
<b>23958</b>	<b>Diagnose and rectify faults in forklift masts</b>	<b>4</b>	<b>5</b>	

\* indicates domain split into two tables to indicate classification changes more clearly.

Domain Tractor and Machine Body Systems \*  
Domain **Tractor and Machine Systems**

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>	<b>Review Category</b>
5438	Describe the functions and general locations of tractor, agricultural machine, and equipment systems <b>Demonstrate knowledge of the functions and general locations of tractor, agricultural machine, and equipment systems</b>	2	4	B
5439	Inspect and fit tractor and agricultural machine safety frames, and repair guarding	4	4	C
<b>23937</b> and	<b>Demonstrate knowledge of tractor and agricultural machine safety frame and cab requirements, and inspection and repairs</b>	<b>4</b>	<b>2</b>	
<b>23938</b>	<b>Inspect and fit tractor and agricultural machine safety frames, and repair guarding</b>	<b>4</b>	<b>3</b>	

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>	<b>Review Category</b>
15471	Describe material handling machine types, their applications, operation, and servicing precautions <b>Demonstrate knowledge of material handling machine types, their applications, operation, and safety precautions</b>	2	4	B

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Domain Tractor and Machine Systems

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>	<b>Review Category</b>
<b>23939</b>	<b>Install and repair materials handling equipment attachments</b>	<b>3</b>	<b>4</b>	<b>New</b>

Domain Trailer Boat Systems

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>	<b>Review Category</b>
<b>23940</b>	<b>Demonstrate knowledge of trailer boat hydraulic principles and system applications</b>	<b>3</b>	<b>5</b>	<b>New</b>

Domain Vehicle Recovery

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>	<b>Review Category</b>
2337	Demonstrate knowledge of vehicle recovery and recover light vehicles and/or machines	3	2	D
2338 and 15481	Describe salvage and recovery procedures and recover heavy vehicles and/or on-road machines Demonstrate knowledge of heavy commercial vehicle and on-road machine flat towing procedures	3 3	4 4	C C
<b>23941 and 23942</b>	<b>Demonstrate knowledge of salvage and recovery procedures to recover heavy vehicles and on-road machines</b> <b>Recover heavy vehicles and/or on-road machines and maintain towing and lifting equipment</b>	<b>3</b> <b>4</b>	<b>3</b> <b>3</b>	
3387	Respond to vehicle breakdown <b>Respond to vehicle and/or machine breakdown</b>	3	1	B
3388 <b>23943 and 23944</b>	Flat tow a car or light commercial vehicle <b>Demonstrate knowledge of flat towing a light vehicle</b> <b>Flat tow a light vehicle</b>	3 <b>3</b> <b>3</b>	1 <b>1</b> <b>1</b>	C
3389	Flat tow a heavy commercial vehicle and/or on-road machine	3	1	D