

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

<b>Subfield</b>	<b>Domain</b>	<b>Id</b>
Motor Industry	Automotive Transmission Systems	922
	Engine Repairs	878, 879, 886, 893, 923, 925, 928, 929, 932, 940, 943, 965, 967, 971, 980, 2313, 2317, 2329, 2334, 2335, 2350, 2351, 3391-3393, 3400, 11723, 11725, 11727-11730, 15434-15438, 15440, 15441-15449

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 have increased from 4 to 6 in standard 879, from 10 to 15 in standard 11723, from 15 to 25 in standard 11725, from 4 to 6 in standard 11729; and decreased from 4 to 2 in standard 2313, and from 10 to 8 in standard 3393 to more accurately reflect the learning requirements.
- The level has decreased from 4 to 3 in standard 11729.
- Standards 886, 928, 971, 2317, and 15443 have each been replaced by two new standards that separate theory knowledge from practical outcomes.
- Standards 878, 965, and 3391 have collectively been replaced by 24269, 24270, and 24271 for a more logical progression and to separate theory knowledge from practical outcomes.
- Standards 967, 15448, and 15449 have collectively been replaced by 24278, 24279, and 24280 for a more logical split of theory knowledge and practical outcomes.
- Standards 923 and 15440 have collectively been replaced by 24274 and M1083, as their content was not previously completed in its entirety in all workshops.
- Standard 925 has been split into two new standards as its content was not previously completed in its entirety in all workshops.
- The standards in the Engine Repairs domain have been reclassified to the Engines 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 932, 2329, 2351, and 11730 have been designated expiring and will not be replaced as they no longer meet industry needs.
- 17 new standards, 24268 and 24287-24302, 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
Subfield	Motor Industry	2	Standards	24277	3
		3	Standards	24270, 24271	4
Domain	Engine Repairs	Any	Domain	Engines	Same
		2	Standards	24277	3
		3	Standards	24270, 24271	4
Standard	878	3	Standard	24269	3
			Standards	24270, 24271	4
	886	4	Standards	24272, 24273	4
	923	3	Standards	24274, 24807	3
	925	3	Standards	24275, 24306	3
	928	2	Standards	24276, 24277	3
	967	4	Standards	24278, 24279, 24280	4
	971	4	Standards	24281, 24282	4
	3391	4	Standard	24269	3
Standards			24270, 24271	4	
15448	4	Standards	24278, 24279, 24280	4	

### 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	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>15449</b>
National Certificate in Motor Industry (Automotive Air Conditioning) [Ref: 0002]	<b>878, 965</b>
National Certificate in Motor Industry (Automotive Dismantling and Recycling) [Ref: 0170]	943
National Certificate in Motor Industry (Automotive Electrical Engineering) [Ref: 0137]	980, 3400
National Certificate in Motor Industry (Automotive Engineering) [Ref: 0019]	<b>878, 893, 922, 3400, 15446</b>
National Certificate in Motor Industry (Automotive Heavy Engineering) with strands in Agricultural Equipment, Plant and Equipment, and Road Transport [Ref: 0003]	929, <b>965, 967, 971, 980, 2317, 2334, 2335, 3391, 3392, 3393, 15440, 15441, 15448, 15449</b>
National Certificate in Motor Industry (Automotive Machining) [Ref: 0371]	<b>878, 879, 929, 932, 943, 965, 971, 2313, 2317, 2350, 3400, 11723, 11725, 11727, 11728, 11729, 11730, 15442, 15444, 15445, 15448</b>
National Certificate in Motor Industry (Automotive Radiator Repair) [Ref: 0188]	<b>878</b>
National Certificate in Motor Industry (Automotive Servicing) [Ref: 0138]	3400, 15446
National Certificate in Motor Industry (Brake Service Engineering) [Ref: 0096]	922, 943
National Certificate in Motor Industry (Diesel Fuel Injection Engineering) [Ref: 0139]	929, <b>2313, 15448</b>
National Certificate in Motor Industry (Motorcycle Engineering) [Ref: 0015]	<b>879, 886, 928, 967, 980, 3400, 15442, 15443, 15444, 15445</b>
National Certificate in Motor Industry (Outdoor Power Equipment Servicing) [Ref: 0697]	<b>879, 928, 940, 2329</b>
National Certificate in Motor Industry (Trailer Boat Systems Engineering) (Level 3) [Ref: 0698]	<b>923, 928, 3400, 15436, 15437, 15447</b>
National Certificate in Motor Industry (Trailer Boat Systems Engineering) (Level 4) [Ref: 0699]	<b>879, 925, 929, 971, 15434, 15435, 15438</b>

The following qualifications are also affected by the outcome of this review. 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 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]	15448	Boating Industry Training Organisation

National Certificate in Materials Processing (Level 1) with strands in General, Plastics Injection Moulding, Plastics Extrusion, Plastics Blow Moulding, Plastics Thermoforming, Plastics Blown Film Extrusion, Plastics Film Conversion, Plastics Injection Stretch-Blow Moulding, Plastics Rotational Moulding, Plastics Film Slitting, Expanded Polystyrene Moulding, Glass Containers, and Paint Manufacturing [Ref: 1072]	Engine Repairs	Plastics and Materials Processing Industry Training Organisation Incorporated
National Certificate in Materials Processing (Level 2) with strands in General, Plastics Injection Moulding, Plastics Extrusion, Plastics Blow Moulding, Plastics Pressure Thermoforming, Plastics Vacuum Thermoforming, Plastics Blown Film Extrusion, Plastics Film Conversion, Plastics Injection Stretch-Blow Moulding, Plastics Rotational Moulding, Expanded Polystyrene Moulding, Polystyrene Pre-expansion, Glass Containers, and Paint Manufacturing [Ref: 1073]	Engine Repairs	Plastics and Materials Processing Industry Training Organisation Incorporated

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

All changes are in **bold**.

<b>Key to review category</b>	
<b>A</b>	Dates changed, but no other changes are made - the new version of the standard carries the same Id and a new version number
<b>B</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
<b>C</b>	Major changes that necessitate the registration of a replacement standard with a new Id
<b>D</b>	Standard will expire and not be replaced

Subfield      Motor Industry  
Domain        Automotive Preventive Maintenance

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>	<b>Review Category</b>
24268	<b>Carry out general service checks on motorcycles</b>	3	2	New

Domain        Automotive Transmission Systems

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>	<b>Review Category</b>
922	Rectify faults in clutches used on cars or light commercial vehicles <b>Check and rectify faults in manual single plate clutches used on light vehicles</b>	3	2	B

Domain Engine Repairs  
 Domain Engines

Id	Title	Level	Credit	Review Category
878	Repair an engine cooling system	3	4	C
965	Analyse vehicle or machine cooling system problems and requirements	5	4	C
3391	Diagnose and rectify faults in heavy vehicle and/or machine diesel engine cooling systems	4	4	C
<b>24269</b>	<b>Demonstrate knowledge of cooling system operation, and factors that affect system efficiency on vehicles or machines</b>	<b>3</b>	<b>4</b>	
<b>24270</b>	<b>Diagnose and rectify faults in vehicle or machine engine cooling systems</b>	<b>4</b>	<b>5</b>	
<b>24271</b>	<b>Demonstrate knowledge of diagnosing vehicle or machine cooling system faults and their causes</b>	<b>4</b>	<b>3</b>	
879	Test a two stroke petrol engine to determine its condition	4	4	B
	<b>Test, diagnose, and rectify faults in a two stroke petrol engine</b>		<b>6</b>	
886	Test a four stroke petrol engine using a tunescope	4	2	C
<b>24272</b>	<b>Demonstrate knowledge of automotive oscilloscope patterns and conducting a test programme on a four stroke petrol engine</b>	<b>4</b>	<b>1</b>	
<b>24273</b>	<b>Test a four stroke petrol engine using relevant test equipment and determine engine condition</b>	<b>4</b>	<b>2</b>	
893	Diagnose and rectify vehicle emission control system faults	4	3	B
923	Carry out general repairs to a cylinder head	3	4	C
15440	Remove and replace a heavy vehicle and/or machine diesel engine cylinder head	3	2	C
<b>24807</b>	<b>Remove, disassemble, inspect, reassemble, and refit an engine cylinder head</b>	<b>3</b>	<b>4</b>	
<b>24274</b>	<b>Carry out general repairs to a cylinder head that does not require machining</b>	<b>3</b>	<b>2</b>	
925	Carry out general repairs to and assemble an engine short block	3	5	C
<b>24275</b>	<b>Disassemble, inspect, and reassemble an engine short block under general supervision</b>	<b>3</b>	<b>3</b>	
<b>24306</b>	<b>Carry out general repairs to an engine short block</b>	<b>3</b>	<b>3</b>	
928	Demonstrate knowledge of, and repair a manual starting system on a small engine	2	2	C
<b>24276</b>	<b>Demonstrate knowledge of manual starting systems used on small engines</b>	<b>2</b>	<b>1</b>	
<b>24277</b>	<b>Inspect manual starting system components and rectify component faults on a small engine</b>	<b>3</b>	<b>1</b>	
929	Test and repair starting aid systems on a diesel engine	3	2	B
	<b>Test and rectify starting aid system faults on a diesel engine</b>			

Id	Title	Level	Credit	Review Category
932	Inspect engine flywheel and fit starter ring gear	2	1	D
940	Check and rectify governor faults on a small engine <b>Inspect and rectify governor faults on a small engine</b>	2	2	B
943	Remove and install an engine assembly from and to a car or light commercial vehicle <b>Remove and install an engine assembly from and to a light vehicle</b>	3	2	B
967	Measure and interpret engine performance	4	4	C
15448	Demonstrate knowledge of engine performance testing, and tune and test a 4 stroke diesel engine	4	7	C
15449	Test a diesel engine on a dynamometer and determine engine condition using test results	4	4	C
24278	<b>Demonstrate knowledge of engine performance testing using a dynamometer</b>	4	2	
24279	<b>Tune and test a four stroke diesel engine</b>	4	6	
24280	<b>Test engine performance using a dynamometer and determine engine condition</b>	4	1	
971	Diagnose and repair diesel engine shut-down systems	4	2	C
24281	<b>Demonstrate knowledge of testing and rectifying diesel engine shutdown system faults</b>	4	2	
24282	<b>Diagnose and rectify diesel engine shutdown system faults</b>	4	3	
980	Service engine driven stationary and mobile generators and power units, and repair control systems <b>Service engine driven stationary and mobile generators and power units, and rectify control system faults</b>	4	3	B
2313	Repair fuel injection pump drives on diesel engines <b>Rectify fuel injection pump drive faults on diesel engines</b>	4	4 2	B
2317	Service diesel engine braking systems and exhaust braking systems	4	4	C
24283	<b>Demonstrate knowledge of diesel engine braking systems and exhaust braking systems, and diagnosing and rectifying faults</b>	4	2	
24284	<b>Diagnose and rectify faults in diesel engine braking systems and exhaust braking systems</b>	4	3	
2329	Repair hand held motors	4	10	D
2334	Remove and install an engine in a heavy vehicle and/or equipment item <b>Remove an engine assembly from, and install the assembly in, a heavy vehicle</b>	3	2	B
2335	Repower heavy vehicles and/or equipment <b>Repower heavy vehicles or equipment</b>	4	3	B

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>	<b>Review Category</b>
2350	Repower cars and light commercial vehicles <b>Repower light vehicles</b>	4	3	B
2351	Remove, assemble and install a motorcycle engine	4	3	D
3392	Repair a heavy vehicle and/or machine diesel engine cylinder head <b>Repair a heavy vehicle diesel engine cylinder head</b>	4	4	B
3393	Repair a heavy vehicle and/or machine diesel engine short block <b>Repair a heavy vehicle diesel engine short block</b>	4	10 8	B
3400	Check a four stroke petrol engine for condition using hand held test equipment	3	4	B
11723	Recondition engine camshafts <b>Inspect and machine engine camshafts</b>	4	10 15	B
11725	Recondition engine crankshafts <b>Inspect and machine engine crankshafts</b>	4	15 25	B
11727	Inspect and recondition an engine cylinder head <b>Prepare to and machine engine cylinder heads</b>	4	20	B
11728	Inspect and recondition an engine short block assembly <b>Prepare to and machine engine short block assemblies</b>	4	25	B
11729	Inspect and recondition engine piston and connecting rod assemblies <b>Inspect and machine engine piston and connecting rod assemblies</b>	4 3	4 6	B
11730	Inspect and rebuild an engine crankshaft or camshaft	4	6	D
15434	Diagnose and rectify inboard 4 stroke diesel engine faults on power boats <b>Diagnose and rectify inboard four stroke diesel engine faults on trailer boats</b>	4	10	B
15435	Diagnose and rectify inboard petrol engine faults on power boats <b>Diagnose and rectify inboard petrol engine faults on trailer boats</b>	4	8	B
15436	Demonstrate knowledge of the construction, operation, and servicing requirements of outboard engines <b>Demonstrate knowledge of the construction and operation, and servicing requirements of outboard engines</b>	2	4	B
15437	Service outboard engines	3	4	B
15438	Diagnose and rectify outboard engine faults	4	4	B
15441	Overhaul an engine cooling system water pump	3	3	B
15442	Carry out repairs to a motorcycle cylinder head	4	6	B

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>	<b>Review Category</b>
15443	Demonstrate knowledge of, test, and repair a motorcycle engine cooling system	3	5	C
<b>24285</b>	<b>Demonstrate knowledge of motorcycle engine cooling systems and testing motorcycle engine cooling systems</b>	<b>3</b>	<b>2</b>	
<b>24286</b>	<b>Diagnose and rectify faults in a motorcycle engine cooling system</b>	<b>3</b>	<b>3</b>	
15444	Repair a motorcycle engine crankshaft assembly	4	4	B
15445	Repair a motorcycle engine piston and cylinder assembly <b>Diagnose and rectify motorcycle engine piston and cylinder assembly faults</b>	3	5	B
15446	Remove and replace a car or light commercial vehicle engine cambelt <b>Remove and replace a light vehicle engine cam belt</b>	3	3	B
15447	Install a replacement engine to a power boat <b>Install a replacement engine in a trailer boat</b>	3	4	B

## Domain Engines

<b>Id</b>	<b>Title</b>	<b>Level</b>	<b>Credit</b>	<b>Review Category</b>
<b>24287</b>	<b>Demonstrate knowledge of disassembling, inspecting, and reassembling an engine short block</b>	<b>3</b>	<b>2</b>	<b>New</b>
<b>24288</b>	<b>Demonstrate knowledge of repowering heavy vehicles or equipment</b>	<b>4</b>	<b>1</b>	<b>New</b>
<b>24289</b>	<b>Diagnose and rectify faults in auxiliary engines on heavy vehicles or equipment</b>	<b>4</b>	<b>5</b>	<b>New</b>
<b>24290</b>	<b>Inspect and service auxiliary engines on heavy vehicles or equipment</b>	<b>3</b>	<b>3</b>	<b>New</b>
<b>24291</b>	<b>Demonstrate knowledge of inspecting and machining engine piston and connecting rod assemblies</b>	<b>3</b>	<b>6</b>	<b>New</b>
<b>24292</b>	<b>Demonstrate knowledge of motorcycle engine cylinder head faults, and their inspection and repair requirements</b>	<b>4</b>	<b>3</b>	<b>New</b>
<b>24293</b>	<b>Demonstrate knowledge of motorcycle engine crankshaft assembly faults and their inspection and repair requirements</b>	<b>4</b>	<b>1</b>	<b>New</b>
<b>24294</b>	<b>Demonstrate knowledge of two stroke petrol engines and diagnosing two stroke petrol engine faults</b>	<b>3</b>	<b>2</b>	<b>New</b>
<b>24295</b>	<b>Demonstrate knowledge of small engine air cooling systems and their test and service procedures</b>	<b>3</b>	<b>2</b>	<b>New</b>
<b>24296</b>	<b>Test and rectify faults in a small engine air cooling system</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>
24297	Demonstrate knowledge of engine gasket and sealant options	3	2	New
24298	Align bore and hone bearing tunnels	4	3	New
24299	Demonstrate knowledge of engine crankshaft and camshaft machining procedures	4	4	New
24300	Check a motorcycle engine for condition and carry out engine tuning requirements	3	4	New
24301	Disassemble, inspect, and reassemble a multi-cylinder motorcycle engine	3	4	New
24302	Demonstrate knowledge of disassembling, inspecting, and reassembling an engine cylinder head	3	2	New