



UNIT STANDARD TRACKING DOCUMENT

National Certificate in Electro-Mechanics - Level 2

National Certificate in Electro-Mechanics - Level 3

National Certificate in Electro-Mechanics - Level 4

July 2008

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List	Old Unit Standards					New revised Unit Standards registered 2008					
	NLRD Ref No	MQA Ref No	Title	Level	Credits	NLRD Ref No	MQA Ref No	Title	Level	Credits	Comments
1	113877		Understand fundamentals of electricity	2	8	113877		Understand fundamentals of electricity	2	8	Equivalent - (SAQA NLRD number still valid)
2						11954		Design and construct a single phase circuit	2	5	
3						116450		Demonstrate a broad understanding of pneumatic and hydraulic systems and concepts	3	4	
4						9881		Mark off basic regular engineering shapes	2	6	
5	12215		Read, interpret and produce basic engineering drawings	2	6	12215		Read interpret and produce basic engineering drawings	2	6	Equivalent - (SAQA NLRD number still valid)
6	10601	ENE-G001	Install an electrical cable	2	3	10253		Install electrical wire ways	2	6	Equivalent
7	10603	ENE-G002	Restore power by joining a low voltage electrical cable	2	4	10603	ENE-G002	Restore power by joining a low voltage electrical cable	2	4	Equivalent - (SAQA NLRD number still valid)
8	10624	ENE-G014	Install a lighting system	2	4	10624	ENE-G014	Install a lighting system	2	4	Equivalent - (SAQA NLRD number still valid)
9	10626	ENE-G015	Repair a lighting system	2	2	10626	ENE-G015	Repair a lighting system	2	2	Equivalent - (SAQA NLRD number still valid)
10	10856	EnM-G085	Install a V-belt drive	2	4	13216		Maintain indirect drives	2	6	Range: Need to do all EnM-G083, EnM-G084, EnM-G085, EnM-G086
	10858	EnM-G086	Repair a V-belt drive	2	4						
		EnM-G083	Install a chain drive	2	4						
		EnM-G084	Repair a chain drive	2	4						
11						13219		Maintain static seats in machines and/or equipment	2	4	
12						13221		Perform routine maintenance	2	8	
13						113876		Identify, inspect and clean electrical machines	2	4	
14						243780		Monitor bearing performance and conduct routine bearing maintenance	2	8	
15	10633	ENE-G019	Use and care for hand held electrical test instruments	2	3	10237		Select use and care for electrical measuring instruments	2	4	Equivalent
16	10740	EnM-G007	Lift and move a load	3	7	10740	EnM-G007	Lift and move a load using a mechanical lifting equipment	3	7	Equivalent - (SAQA NLRD number still valid)
17		EnM-G099	Grind material by means of a pedestal / bench grinding machine	2	2	10784		Grind steel by means of a pedestal / bench grinding machine	2	2	Equivalent
18	12216		Select, use and care for engineering hand tools	2	8	119744		Select, use and care for engineering hand tools	2	8	Equivalent
19	10255		Select, use and care for power tools	2	5	12219		Select, use and care for engineering power tools	2	6	Equivalent
20	12478		Select, use and care for engineering measuring equipment	2	4	12478		Select use and care for engineering measuring equipment	2	4	Equivalent - (SAQA NLRD number still valid)
21	5739		Basic Rigging	2	4	12481		Sling loads	2	4	Equivalent
22		EnM-G100	Drill a hole by means of a radial arm or pedestal drilling machine	2	4	13214		Operate and monitor a drilling machine to produce simple components	2	6	Equivalent
23						113863		Apply soldering techniques	2	2	
24						7547		Operate a personal computer system	2	6	
25						10233		Install or replace electrical metering units or measuring instruments	2	4	
26	10762	EnM-G024	Join mild steel by means of arc welding	2	11	114669		Carry out basic electric arc welding in an electrical environment	2	8	Equivalent
27	10248	ENE-G057	Replace electrical components in a distribution board	2	3	10254		Maintain electrical distribution boards, panels and enclosures	2	6	Range: Need to do all - EnE-G003, EnE-G004, EnE-G057
	10605	ENE-G003	Inspect and clean a distribution board	2	2						
	10607	ENE-G004	Install a distribution board	2	3						
28	10296	ENE-G005	Carry out a close inspection on a transformer	1	1	113858		Maintain transformers	2	5	Range: Need to do all - EnE-G005, EnE-G049, EnE-G095
	10272	ENE-G049	Change the tap settings on a three-phase transformer	3	2						
		EnE-G095	Carry out a detailed inspection on a high voltage transformer and ancillary equipment	3	2						
29						13297		Grind tools and drill bits	3	4	
30		EnM-G413	Make up a threaded pipe system	2	2	13218		Maintain pipe systems	2	20	Range: Need to do all - EnM-G054, EnM-G055, EnE-G413
	10803	EnM-G054	Replace a flange mounted valve	1	2						
	10805	EnM-G055	Replace a flanged pipe section	2	2						
31	10745	EnM-G012	Cut mild steel by means of an Oxy-acetylene cutting torch	2	3	114616		Carry out basic gas welding, brazing and cutting in an electrical environment	2	8	Range: Need to do all - EnM-G012, EnM-G046, EnE-G047, EnE-G056
	10787	EnM-G046	Assemble Oxy-acetylene equipment	2	1						
	10789	EnM-G047	Weld mild steel by means of Oxy-acetylene equipment	3	4						
	10808	EnM-G056	Braze metals by means of oxy-acetylene equipment	3	4						
32		EnM-G412	Identify engineering equipment and materials	1	7	243783		Identify and select engineering equipment and materials.	1	4	Equivalent
33		EnM-G419	Demonstrate knowledge of the principles of the transfer of mechanical power	1	2	243762		Demonstrate knowledge of the principles of the transfer of mechanical power	1	2	Equivalent
34		EnM-G488	Identify, select and examine different types of bearings and describe their application	1	1	243781		Identify, select and examine different types of bearings	1	1	Equivalent
35		EnM-G491	Identify, select and apply mechanical fasteners	2	4	243782		Identify, select and apply mechanical fasteners	2	4	Equivalent
36	10739	EnM-G006	Repair a double drum scraper winch	2	2	10739		Repair a double scraper winch	2	4	Range: Need to do all - EnM-G006, EnM-G032
	10770	EnM-G032	Replace a double drum scraper winch	2	3						
37	10632	ENE-G018	Install a straining wire cable support system	2	2	10632	ENE-G018	Install a straining wire cable support system	2	2	Equivalent - (SAQA NLRD number still valid)
38	110404	ENE-G017	Carry out a detailed inspection on intrinsically safe apparatus and circuits	2	3	110404	ENE-G017	Carry out a detailed inspection on intrinsically safe apparatus and circuits	2	3	Equivalent - (SAQA NLRD number still valid)
39		EnM-G492	Demonstrate knowledge of lubrication	2	2	243769		Demonstrate knowledge of lubrication	2	2	Equivalent

List	Old Unit Standards					New revised Unit Standards registered 2008					Comments
	NLRD Ref No	MQA Ref No	Title	Level	Credits	NLRD Ref No	MQA Ref No	Title	Level	Credits	
40		EnE-G049	Connect and commission a three-phase direct on line motor control system	3	6	10281	EnE-G049	Connect and commission a three-phase direct on line motor control system	3	6	Equivalent
41						10270		Construct Basic Electronic Circuits	3	4	
42						113899		Demonstrate an understanding of basic programmable logic controllers	3	6	
43						13639		Fault find on alternating current (AC) and direct current (DC) systems	3	8	
44						13134		Install and program basic programmable logic controllers	3	20	
45	10601	ENE-G001	Install an electrical cable	2	3	114388		Install, joint and terminate Low Voltage cables and conductors	3	8	Range: Need to do all ENE-G001, ENE-G002, ENE-G009
	10618	ENE-G009	Terminate and connect a low voltage cable end	2	3						
	10603	ENE-G002	Restore power by joining a low voltage electrical cable	2	4						
46						13117		Install, test and maintain a basic hydraulic system	3	10	Equivalent
47	10735	EnM-G002	Replace a taper sleeve type bearing	2	2	13283		Maintain bearings in machines and equipment	3	8	Range: Need to do all EnM-G002, EnM-G126, EnM-G488
	10632	EnM-G126	Replace a direct mount bearing	2	3						
		EnM-G488	Identify, select and examine different types of bearings and describe their application	1	1						
48	15321	EnM-G153	Replace the clutch assembly of a self propelled mobile machine	2	3	13282		Maintain brakes and clutches	3	6	Range: Need to do all EnM-G153, EnM-G284, EnM-G475
		EnM-G284	Repair the brake thruster (hold back unit) of a conveyor belt system	2	2						
		EnM-G475	Replace electro magnetic brakes	3	2						
49	10822	EnM-G119	Replace a tyre type drive coupling	2	2	13280		Maintain direct drives	3	6	Range: Need to do all EnM-G001, EnM-G019, EnM-G120, EnM-G386
	10823	EnM-G120	Replace a pin and bush type drive coupling	2	2						
		EnM-G386	Replace a spring type coupling	3	3						
	10734	EnM-G001	Replace a fluid drive coupling	3	3						
50		EnM-G307	Replace a mechanical seal on a glass lined reactor	3	3	13279		Maintain dynamic seals in machines and / or equipment	3	3	Equivalent
51		EnM-G492	Demonstrate knowledge of lubrication	2	2	13277		Maintain lubricating systems	3	4	Range: Need to do both EnM-G220, EnM-G492
		EnM-G220	Replace mechanical components on a lubrication system	2	3						
52						114406		Understand basic electronic theory and components	3	4	
53		EnM-G154	Replace auto electrical components on a self propelled mobile machine	2	3	10653		Carry out a detailed inspection of an auto electrical system on a self-propelled mobile machine	2	5	Equivalent
54						119735		Remove, test, fit and service automobile batteries	2	4	
55		EnM-G186	Replace components on the liquid cooling system of a self-propelled mobile machine	2	3	10788		Repair the liquid cooling system of an internal combustion engine	2	3	Equivalent
56	10829	EnM-G124	Repair the transfer gearbox of self propelled mobile machine	2	3	10829	EnM-G124	Repair the transfer gearbox of a self-propelled mobile machine	2	3	Equivalent - (SAQA NLRD number still valid)
57	10777	EnM-G039	Replace a multi-stage centrifugal pump	2	2	10777	EnM-G039	Replace a multi-stage centrifugal pump	2	2	Equivalent - (SAQA NLRD number still valid)
58	10800	EnM-G053	Replace the final drive axle assembly of a self propelled mobile machine	2	4	10800	EnM-G053	Replace the final-drive axle assembly of a self-propelled mobile machine	2	4	Equivalent - (SAQA NLRD number still valid)
59	10828	EnM-G123	Replace the manual transmission of a vehicle	2	3	10828	EnM-G123	Replace the manual transmission of a vehicle	2	3	Equivalent - (SAQA NLRD number still valid)
60						10260		Install and commission electrical measuring instruments and control devices	3	5	
61						10261		Install and Commission Single Phase AC Machines and Control Gear	3	8	
62		EnE-G100	Connect and commission 3 phase transformer	3	4	114660		Install Medium Voltage transformers	3	6	Equivalent
63						13139		Install, test and maintain a basic pneumatic system	3	10	
64						14134		Maintain and repair single phase AC machines and control gear	3	6	
65	10854	EnM-G081	Repair a positive displacement pump	3	6	13276		Maintain pumps	3	24	Range: Need to do all - EnM-G011, EnM-G081, EnM-G142, EnM-G347
	10862	EnM-G142	Repair a vertical spindle pump	2	4						
	116650	EnM-G347	Repair a screw pump	3	2						
	10744	EnM-G011	Overhaul a portable submersible centrifugal pump	2	2						
67	10779	EnM-G041	Overhaul a multi-stage centrifugal pump	3	6	10779	EnM-G041	Overhaul of a multi-stage centrifugal pump	3	6	Equivalent - (SAQA NLRD number still valid)
68	10778	EnM-G040	Repair a multi-stage centrifugal pump	3	7	10778	EnM-G040	Repair a multi-stage centrifugal pump	3	7	Equivalent - (SAQA NLRD number still valid)
69	10746	EnM-G013	Repair a single stage centrifugal pump	3	7	10746	EnM-G013	Repair a single-stage centrifugal pump	3	7	Equivalent - (SAQA NLRD number still valid)
70	10627	EnM-G067	Repair a piston type air compressor	3	7	243773		Repair an air compressor	3	10	Range: Need to do all - EnM-G067, EnM-G068, EnM-G069
	10831	EnM-G068	Repair a vane type air compressor	3	7						
	10834	EnM-G069	Repair a screw type air compressor	3	7						
71	10773	EnM-G035	Repair the hydraulic braking system of a self-propelled machine	3	7	10773	EnM-G035	Repair the hydraulic braking system of a self-propelled machine	3	7	Equivalent - (SAQA NLRD number still valid)
72	10766	EnM-G028	Replace the diesel engine of a self-propelled mobile machine	3	5	10766	EnM-G028	Replace the diesel engine of a self-propelled mobile machine	3	5	Equivalent - (SAQA NLRD number still valid)
73						10262		Maintain and repair three phase AC machines and control gear	4	12	
74	10720	ENE-G060	Carry out a detailed inspection on low voltage switchgear	2	3	13818		Maintain low voltage switchgear	4	4	Equivalent
75	10816	ENE-G008	Carry out a detailed inspection on a flameproof enclosure	2	3	10616	ENE-G008	Carry out a detailed inspection on a flameproof enclosure	2	3	Equivalent
76	10759	EnM-G021	Repair the mechanical brake system of an underground locomotive	2	5	10759	EnM-G021	Repair the mechanical brake system of an underground locomotive	2	5	Equivalent - (SAQA NLRD number still valid)

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List	Old Unit Standards					New revised Unit Standards registered 2008					
	NLRD Ref No	MQA Ref No	Title	Level	Credits	NLRD Ref No	MQA Ref No	Title	Level	Credits	Comments
77						113899		Demonstrate an understanding of basic programmable logic controllers	3	6	
78						13327		Diagnose and repair faults on equipment and machinery during production/operation	4	24	
79						12414		Diagnose and repair faults on low voltage transformers and equipment	4	6	
80						116246		Fault find and repair Equipment associated with Final Control Elements	4	10	
81						10259		Fault find, repair and maintain three phase voltage electrical circuits	4	8	
	10794	EnM-G050	Trouble shoot the pneumatic system of a self propelled mobile machine	3	6						
	10861	EnM-G088	Repair a pneumatic cylinder	2	4						
	10863	EnM-G089	Replace a pneumatic cylinder	2	2						
	10864	EnM-G090	Overhaul a pneumatic cylinder	2	5						
	10869	EnM-G093	Replace a pneumatic motor	2	3						
		EnM-G166	Replace a hydraulic / pneumatic accumulator	3	2						
		EnM-G235	Construct a hydraulic/ pneumatic circuit	3	6						
		EnM-G236	Diagnose performance of hydraulic/pneumatic components	3	5						
		EnM-G247	Read and interpret hydraulic/pneumatic circuits and symbols from a schematic diagram	2	2						
		EnM-G263	Repair pneumatic brakes	3	5						
		10869	EnM-G087	Repair a hydraulic cylinder	2	4					
		10868	EnM-G091	Replace a hydraulic pump/motor	2	3					
		10837	EnM-G129	Replace hydraulic pipes and fittings	2	3					
		10844	EnM-G133	Repair a hydraulic accumulator	2	3					
		15319	EnM-G157	Replace a hydraulic valve bank	3	4					
	10720	ENE-G080	Carry out a detailed inspection on low voltage switchgear	2	3						
	10624	ENE-G020	Install or replace an earth leakage unit in a low voltage circuit	2	3	13818		Maintain low voltage switchgear	4	4	Range: Need to do both ENE-G020, ENE-G080
84						13328		Rebuild machines	4	24	
85						113897		Troubleshoot on programmable logic controllers	4	5	
86	10521	ENE-G011	Identify the correct phase sequence on high voltage transformers and cables	3	3	10621	ENE-G011	Identify the correct phase sequence on high voltage transformers and cables	3	3	Equivalent - (SAQA NLRD number still valid)
	10827	EnM-G067	Repair a piston type air compressor	3	7						
	10831	EnM-G068	Repair a vane type air compressor	3	7	243773		Repair an air compressor	3	10	Range: Need to do all - EnM-G067, EnM-G068, EnM-G069
	10834	EnM-G069	Repair a screw type air compressor	3	7						
88						13303		Align machines and equipment using laser technology	4	6	
	10521	ENE-G011	Identify the correct phase sequence on high voltage transformers and cables	3	3						
	10272	ENE-G049	Change the tap settings on a three-phase transformer	3	2						
		EnE-G095	Carry out a detailed inspection on a high voltage transformer and ancillary equipment	3	2	113880		Inspect, test and maintain Medium / High Voltage transformers	4	6	Range: Need to do all - EnE-G011, EnE-G049, EnE-G095, EnE-G100
		EnE-G100	Connect and commission 3 phase transformer	3	4						
	10752	EnM-G018	Overhaul a single speed reduction gearbox	2	5						
		EnM-G472	Overhaul a shaft mounted gearbox	3	4	13325		Maintain gearboxes	4	10	Range: Need to do all -EnM-G003, EnM-G018 or EnM-G472
		10736	EnM-G003	Replace a reduction gearbox	2	3					
	10752	EnM-G018	Overhaul a single speed reduction gearbox	2	5						
		EnM-G472	Overhaul a shaft mounted gearbox	3	4						
		10736	EnM-G003	Replace a reduction gearbox	2	3					
		EnM-G209	Replace components of a swing gearbox of a dragline	3	3	13325		Maintain gearboxes	4	10	Open Cast Mining Range: Need to do all - EnM-G003, EnM-G018 or EnM-G472, EnM-G209, EnM-G266, EnM-G281, EnM-G287, EnM-G345, EnM-G388
		EnM-G266	Replace components of a hoist gearbox of a dragline	3	3						
		EnM-G281	Repair the propel gearbox of a dragline (motor pinion, bearings, bull gear)	3	4						
		EnM-G267	Replace pump drive gearbox of an overburden drill	2	2						
		EnM-G345	Replace the swing gearbox on a rope shovel	2	3						
		EnM-G389	Replace a propel gearbox on a hydraulic/rope shovel	2	2						
	10752	EnM-G018	Overhaul a single speed reduction gearbox	2	5						
		EnM-G472	Overhaul a shaft mounted gearbox	3	4	13325		Maintain gearboxes	4	10	Coal Mining Range: Need to do all -EnM-G003, EnM-G018 or EnM-G472, EnM-G266, EnM-G332
	10736	EnM-G003	Replace a reduction gearbox	2	3						
		EnM-G328	Replace the down drive traction gearbox on a wall mining shearer	3	3						
		EnM-G332	Replace gearbox components of a wall mining shearer	3	3						
93						13326		Maintain safety valves	4	4	
94	10791	EnM-G049	Trouble shoot the hydraulic system of a self propelled mobile machine	3	6	10791	EnM-G049	Troubleshoot the hydraulic system of a self propelled mobile machine	3	6	Equivalent - (SAQA NLRD number still valid)
95	116656	EnM-G364	Repair a rotary packer	3	2	116656	EnM-G364	Repair a rotary packer	3	2	
96	10731	ENE-G071	Repair an electronic control system for AC multi-speed motor	3	6	110384	ENE-G071	Repair an electronic control system for an AC multi-speed motor	3	6	Equivalent