



Model Curriculum

HEMM Mechanic

SECTOR: MINING

SUB-SECTOR: ENGINEERING SERVICES

OCCUPATION: FIELD SERVICES - MECHANICAL

REF ID: MIN/Q0433

NSQF LEVEL: 4



Certificate

CURRICULUM COMPLIANCE TO QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

SKILL COUNCIL FOR MINING SECTOR

for the

MODEL CURRICULUM

Complying to National Occupational Standards of
Job Role/ Qualification Pack: '**HEMM Mechanic**' QP No. '**MIN/Q 0433 NSQF Level 4**'

Date of Issuance: **December 24th, 2015**

Valid up to: **March 31st, 2017**

* Valid up to the next review date of the Qualification Pack


Authorised Signatory
(Skill Council for Mining Sector)



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HEMM Mechanic

CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of a “HEMM Mechanic”, in the “Mining” Sector/Industry and aims at building the following key competencies amongst the learner

Program Name	HEMM Mechanic		
Qualification Pack Name & Reference ID.	MIN/Q0433		
Version No.	1.0	Version Update Date	12 – 12 – 2015
Pre-requisites to Training	Preferably ITI (Motor Vehicle Mechanic), Technical and gallery training as per first schedule, Mining Vocational Training Rules (MVTR) 1966 (suggested but not mandatory).		
Training Outcomes	<p>After completing this programme, participants will be able to:</p> <p>Gain familiarity with the HEMM Mechanic: General introduction to HEMM, responsible for repair, maintenance, heavy earth moving machinery, medium and light vehicles, pumps and compressors and other mechanical equipment and assemblies used in a mine.</p> <p>Become well versed with Environment Health & Safety: Well versed with health and safety measures in terms of personal safety and controls emergency operations.</p> <p>Identify and use basic tools, equipment & materials: Understanding of using hand tools and power tool as applied to maintenance and servicing requirements.</p>		

This course encompasses 3 out of 3 National Occupational Standards (NOS) of “HEMM Mechanic” Qualification Pack issued by “SSC: Skill Council for Mining Sector”.

Sr. No.	Module	Key Learning Outcomes	Equipment Required
1	<p>Introduction</p> <p>Theory Duration (hh:mm) 03:00</p> <p>Practical Duration (hh:mm) 05:00</p> <p>Corresponding NOS Code Bridge Module</p>	<p>Understanding of</p> <ul style="list-style-type: none"> Types of earth moving equipment Inspection, repair and maintenance of earth moving equipment Basic Machinery defect diagnostic Basic safety measures to be adopted for machine maintenance use of machine tool 	<p>PPTs of Iron and steel manufacturing, Charts showing the same</p>
2.	<p>Diagnose HEMM for repair requirements</p> <p>Theory Duration (hh:mm) 15:00</p> <p>Practical Duration (hh:mm) 30:00</p> <p>Corresponding NOS Code MIN/N 0491</p>	<ul style="list-style-type: none"> Knowledge and understanding of an individual to assist in diagnosing faults and troubleshooting problems in a Heavy Earth Moving Machine (HEMM) Identify and diagnose operational faults. Use diagnostic procedures as defined in the troubleshooting checklist prepared by the equipment manufacturer Use diagnostic tools as required to assess the problem, this includes using on board diagnostic computer to attain vehicle data and compare the same with standard output to detect faults in the system. The basic technology used in and functioning of various components and aggregates of the vehicle. The tools used to assess and confirm technical faults that cannot be determined through a visual inspection. 	<p>Engines of HEMM equipment (Shovel & Dump-truck), Transmissions of HEMM equipment, Tools & tackles for repairs, Lathe machine, Tyre equipment.</p>
3.	<p>Carry out service and repairs of engine and aggregates.</p> <p>Theory Duration (hh:mm) 30:00</p> <p>Practical Duration (hh:mm) 95:00</p>	<ul style="list-style-type: none"> Perform HEMM maintenance operation for activities that need to be carried out during a shift. ensure OEM recommended procedure and checklist is followed for routine servicing calibrate, align and adjust settings, alignment, pressures, tension, speeds and levels relevant to: <ul style="list-style-type: none"> engine and aggregates 	<p>Undercarriages of tracked equipment, 5 tonne crane, Allen Key set of 12 pieces, Caliper inside 15 cm Spring, Calipers outside 15 cm spring, Center Punch 10 mm. Dia. x 100 mm., Electrician Screw Driver 250 mm, Hammer ball peen 0.5 kg with handle,</p>

Sr. No.	Module	Key Learning Outcomes	Equipment Required
	Corresponding NOS Code MIN/N 0492	<ul style="list-style-type: none"> transmission system load bearing arms and structure Safety devices and components installed electrical and electronic components other components (including to valves, ignition, fuel and emissions, brakes, transmission, lights, tyres, steering and body fittings) Identify typical causes and symptoms of operational faults and failures of a vehicle corrective action to be taken for common engine and aggregate system faults and failures. 	Pliers combination 20 cm., Screw driver 20cm.X 9mm. Blade, Scriber 15 cm, Spanner, ring set of 12 metric sizes 6 to 32 mm, Spanner D.E. set of 12 pieces (6mm to 32mm), Spanners socket with speed handle, T-bar, ratchet and universal upto 32, Steel rule 30 cm inch and metric, Steel tool box with lock and key (folding type) 400x200x150 mm, Wire cutter and stripper.
4.	Health & Safety Theory Duration (hh:mm) 12:00 Practical Duration (hh:mm) 20:00 Corresponding NOS Code MIN / N0204	<ul style="list-style-type: none"> This unit is about health and safety measures critical in open-cast mines Health and safety measures critical for personnel working in open-cast mines Comply with occupational health and safety regulations adopted by the employer. Follow mining operations procedures with respect to materials handling and accidents. Adhere the of safety guidelines specified by Directorate General of Mine Safety (DGMS)). 	Gloves, Safety shoes, Safety goggles, Safety helmet, Fire extinguisher, Types of log book, First Aid box.
	Total Duration Theory Duration (hh:mm) 60:00 Practical Duration (hh:mm) 150:00	Unique Equipment Required: Engines of HEMM equipment (Shovel & Dump-truck), Transmissions of HEMM equipment, Tools & tackles for repairs, Lathe machine, Tyre equipment, Undercarriages of tracked equipment, 5 tonne crane, Allen Key set of 12 pieces, Caliper inside 15 cm Spring, Calipers outside 15 cm spring, Center Punch 10 mm. Dia. x 100 mm., Electrician Screw Driver 250 mm, T-bar, ratchet and universal upto 32, Steel rule 30 cm inch and metric, Wire cutter and stripper, Gloves, Safety shoes, Safety goggles, Safety helmet, Fire extinguisher, Types of log book, First Aid box.	

Grand Total Course Duration: 210 Hours, 0 Minutes

(This syllabus/ curriculum have been approved by SSC: Skill Council for Mining Sector).

Trainer Prerequisites for Job role: “HEMM Mechanic” mapped to Qualification Pack: “MIN/Q0433”

Sr. No.	Area	Details
1	Description	To deliver accredited training service, mapping to the curriculum detailed above, in accordance with the Qualification Pack “MIN/Q0433”.
2	Personal Attributes	Aptitude for conducting training, and pre/ post work to ensure competent, employable candidates at the end of the training. Strong communication skills, interpersonal skills, ability to work as part of a team; a passion for quality and for developing others; well-organised and focused, eager to learn and keep oneself updated with the latest in the mentioned field.
3	Minimum Educational Qualifications	ITI (Motor Vehicle Mechanic)
4a	Domain Certification	Certified for Job Role: “HEMM Mechanic” mapped to QP: “MIN/Q0433”. Minimum accepted score for domain certification will be 85%.
4b	Platform Certification	Recommended that the Trainer is certified for the Job Role: “Trainer”, mapped to the Qualification Pack: “SSC/Q1402”. Minimum accepted score for platform certification will be 90%.
5	Experience	Heavy Commercial Vehicle Driving License. Technical and gallery training as per first schedule, Mining Vocational Training Rules (MVTR) 1966 suggested but not mandatory.

Annexure: Assessment Criteria

Assessment Criteria for HEMM Mechanic	
Job Role	HEMM Mechanic
Qualification Pack	MIN/Q0433
Sector Skill Council	Mining

Sr. No.	Guidelines for Assessment
1	Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.
2	The assessment of the theory/knowledge will be based on written test/viva-voce or both while skill test shall be hands on practical. Behaviour and attitude will be assessed while performing the task.
3	Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below)
4	Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on this criteria
5	To pass the Qualification Pack , every trainee should score a minimum of 70% in skills, 30 % in knowledge and 70% in practical including Behaviour separately in each attributes.
6	In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack.

		Marks Allocation			
		Total Mark (100)	Out Of	Theory	Skills Practical
1. MIN/N 0491(Diagnose HEMM for repair requirements)	PC1. Conduct scheduled, routine examination methods and assessments against vehicle specifications to identify damage, corrosion, inadequate fluid levels, leaks, wear, security problems and general condition and serviceability	35	4	1	3
	PC2. Review complaint sheet and understand repair requirements.		3	1	2
	PC3.Understand original equipment manufacturers' specifications and follow standard operating procedure set out for diagnosing faults.		3	1	2
	PC4.Use diagnostic procedures as defined in the troubleshooting checklist prepared by the equipment manufacturer.		3	1	2
	PC5.Use diagnostic tools as required to assess the problem, this includes using on board diagnostic computer to attain vehicle data and compare the same with standard output to detect faults in the system		3	1	2
	PC6.check and make adjustments to clearances, gaps, settings, alignment, pressures, tension, speeds and levels relevant to the engine area, transmission area, chassis area, electrical area and body (including to valves, ignition, fuel and emissions, brakes, transmission, lights, tyres, steering and body fittings).		3	1	2
	PC7.Check routine service components and materials, including filters, drive, belts, wiper blades, brake linings and pads, lubricants and fluids.		3	1	2
	PC8.recognise cosmetic damage to vehicle components and units outside normal service items.		3	1	2
	PC9.Check lubricant levels and identify codes and grades of lubricants to be used for specific components of		3	1	2

		Marks Allocation			
		Total Mark (100)	Out Of	Theory	Skills Practical
	HEMM.				
	PC10. Dismantle specific components and assemblies to identify faults		4	1	3
	PC11. Report malfunctions or repair requirements observed in vehicles beyond what is mentioned in the complaint sheet.		3	1	2
	Total		35	11	24
2.MIN/N 0492(Carry out service, repair and maintenance activities)	PC1.ensure OEM recommended procedure and checklist is followed for routine servicing.		5	1	4
	PC2.in case of non-routine service or repair, confirm tasks to be carried out with superior .		5	1	4
	PC3. Ensure that the correct spare parts, lubricants, tools and other materials required have been obtained.		5	2	3
	PC4. calibrate, align and adjust settings, alignment, pressures, tension, speeds and levels relevant to: <ul style="list-style-type: none"> • engine and aggregates • transmission system • load bearing arms and structure • Safety devices and components installed • electrical and electronic components • other components (including to valves, ignition, fuel and emissions, brakes, transmission, lights, tyres, steering and body fittings) 	35	5	2	3
	PC5. Identify and change components requiring change due to continuous wear and tear including: <ul style="list-style-type: none"> • oil and air filters • drive belts • braking system • drive 		5	2	3
	PC6.ensure disposal of materials in accordance with the organization's policies.		5	1	4

		Marks Allocation			
		Total Mark (100)	Out Of	Theory	Skills Practical
	PC7. refill correct grade of coolants, lubricants and other fluids as per OEM.		5	1	4
		Total	35	10	15
3. MIN / N 0901 (Health and Safety)	PC1. Comply with occupational health and safety regulations adopted by the employer.	30	3	1	2
	PC2. Follow mining operations procedures with respect to materials handling and accidents		3	1	2
	PC3. Follow the correct safety steps in case of accident or major failure		3	1	2
	PC4. Comply with safety regulations and procedures in case of fire hazard.		3	1	2
	PC5. Operate various grades of fire extinguishers.		3	1	2
	PC6. Work responsibly and as safe and careful as possible so as not to put the health and safety of self or others at risk, including members of the public.		2	0	2
	PC7. Perform storage and transport of hazardous materials compliant with safety guidelines prescribed by DGMS.		2	0	2
	PC8. Deal with misfires as per statutory requirement.		2	1	1
	PC9. Identify characteristics of post-blast fumes and take necessary precautions.		3	1	2
	PC10. Wears safety gear such as hard hat, respiratory protection, eye protection, ear protection.		3	1	2
	PC11. Follow the manufacturer's instructions for care and safe operation of the equipment.		3	1	2
	NOS Total	Total	30	9	21
	QP Total		100	30	70



Skill Council for Mining Sector

FIMI House, B-311, Okhla Industrial Area, Phase-I, New Delhi-110 020