



Gujarat Council of Vocational Training
Gandhinagar



1. Name of Course:

Operation and Maintenance of Road
Construction Equipments

N.C.O. No. for Skills Covered:
(Please refer National Classification of
Occupations -2004 available
on www.dget.nic.in)

2. Engineering OR Non-engineering: Engineering

3. No. of students per batch: 20

4. Duration in Hours. : 500

5. Duration in Month: 3 (42 Hours / Week)

6. Examination Scheme:

No.	Name of Subject	Teaching Hours during full course.	Maximum Marks. (Excluding Sessional)	Minimum Marks required for Passing (Excluding Sessional).	Sessional Marks if any.
Subject-1	Trade Theory	100	50	20	
Subject-2	Trade Practical	400	150	90	
Subject-3					
Subject-4					
Subject-5					

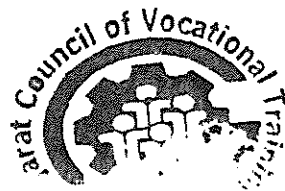
7. Entry qualification for Trainee:

Minimum entry qualification (Essential): 10 th Pass
Desirable: ITI Holder

8. Minimum qualification for Trainer:

Minimum qualification (Essential): DME
Desirable: BE

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9. Syllabus Committee Member:

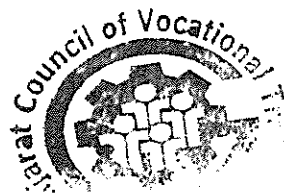
Sr. No.	Name	Organization	Designation	Technical Qualification	Experience in Years	Signature
1.	Rakesh Prajapati	Skill Development Program. Ganpat University	Lecturer	B.E.	15	R.H. Prajapati
2.	Dharmendra Brahmhatt	Ammann Apollo(India) Pvt. Ltd.	Assist Manager	DME	15	Dharmendra
3	K.N.Patel	B.S.Patel Polytechnic	Sr.Lecturer	BE	16	K.N.
4	D.I.Patel	ITI, Mehsana	SI	Diploma	20	D.I.Patel
5.	C.K.Chauhan	ITI, Mehsana	Principal	Diploma	20	C.K.Chauhan

10. Terminal Skills of trainee: (Should be well defined and having reference to NCO):

The trainee, after successful completion of training, will have following skills...

1. On successful completion of training one should be able to carry out Maintenance & repair of mining machineries and road constructions equipments.
- 2.
- 3.
- 4.
- 5.
- 6.

(please attach separate sheet, if more space is required)



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1. Approximate cost of Tools
Equipments Machinery for
Starting one batch of the course:

Rupees
Rs. 1.33Crore

Reference Year
2015

2. Area required for practical Workshop for one batch.

150. Sq. Meter

3. Minimum Power connection required

4 K.W.

4.1 No of items in Standard list of Machinery:

5

4.1.1. Page NO from 5 to 6.

4.2 No of items in Standard list of Measuring Tool kit

11

4.2.1. Page NO from 5 to 5.

4.3 No of items in Standard list of Trainee Toll-Kit:

25

4.1.1. Page NO from 5 to 6.

***** FOR OFFICIAL USE *****

Approved by GCVT in Governing Body meeting on

18.02.2017

Syllabus implemented w.e.f. admission session

next session

Revision History :

1. Revision No..... Revision Date.

2. Revision No..... Revision Date.

3. Revision No..... Revision Date.

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Standard List of Machinery Measuring tool kit Trainee Toolkit For Trade of Operation and Maintenance of Road Construction Equipments

Sr. No.	Description of Item with detailed specifications	Item type i.e. Machinery Equipment OR Shop Outfit OR Trainee Toolkit	Quantity Required per one Batch of Students	Quantity Required per one Batch of Students for Instructor	Total Quantity Required (Total of previous two columns)
1.	Open Spanner	Tool kit	2 Nos.		2 Nos.
2.	Ring Spanner	Tool kit	2 Nos.		2 Nos.
3.	Combination Spanner	Tool kit	2 Nos.		2 Nos.
4.	Allen Key	Tool kit	2 Nos.		2 Nos.
5.	Toxy Allen Key	Tool kit	2 Nos.		2 Nos.
6.	Socket box	Tool kit	2 Nos.		2 Nos.
7.	Socket box	Tool kit	2 Nos.		2 Nos.
8.	Torque Wrench	Tool kit	2 Nos.		2 Nos.
9.	Torque Wrench	Tool kit	2 Nos.		2 Nos.
10.	Inner Plier	Tool kit	2 Nos.		2 Nos.
11.	Outer Plier	Tool kit	2 Nos.		2 Nos.
12.	Nose Plier	Tool kit	2 Nos.		2 Nos.
13.	Monkey Plier	Tool kit	2 Nos.		2 Nos.
14.	Grip Plier	Tool kit	2 Nos.		2 Nos.
15.	Adjustable Plier	Tool kit	2 Nos.		2 Nos.
16.	Circlip outer Plier	Tool kit	2 Nos.		2 Nos.
17.	Circlip inner Plier	Tool kit	2 Nos.		2 Nos.

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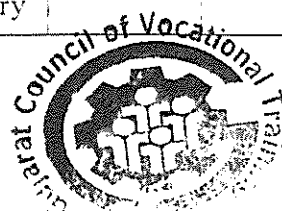


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18.	Hammer	Tool kit	2 Nos.	2 Nos.
19.	Chisel	Tool kit	2 Nos.	2 Nos.
20.	Pipe Wrench	Tool kit	2 Nos.	2 Nos.
21.	Screw Driver Plus	Tool kit	2 Nos.	2 Nos.
22.	Screw Driver Minus	Tool kit	2 Nos.	2 Nos.
23.	Puller	Tool kit	2 Nos.	2 Nos.
24.	Filter wrench	Tool kit	2 Nos.	2 Nos.
25.	Mechanical screw jack	Tool kit	1Nos	1Nos
26.	Micro Meter	Measuring Tool kit	2 Nos.	2 Nos.
27.	Micro Meter	Measuring Tool kit	2 Nos.	2 Nos.
28.	Vernier Caliper	Measuring Tool kit	2 Nos.	2 Nos.
29.	Bore Gauge	Measuring Tool kit	2 Nos.	2 Nos.
30.	Magnetic Stand	Measuring Tool kit	2 Nos.	2 Nos.
31.	Dial Gauge	Measuring Tool kit	2 Nos.	2 Nos.
32.	Filler Gauge	Measuring Tool kit	2 Nos.	2 Nos.
33.	Digital Multimeter	Measuring Tool kit	2 Nos.	2 Nos.
34.	Ring Compressor	Measuring Tool kit	2 Nos.	2 Nos.
35.	Pressure Gauge	Measuring Tool kit	2 Nos.	2 Nos.
36.	Pressure Gauge	Measuring Tool kit	2 Nos.	2 Nos.
37.	Hydraulic Sensor Paver	Machinery	1Nos	1Nos
38.	Excavator	Machinery	1Nos	1Nos
39.	Wheel loader	Machinery	1Nos	1Nos

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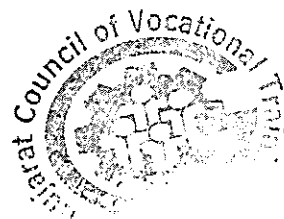


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40.	Soil Compactor	Machinery	1Nos	1Nos
41.	Tandem Roller	Machinery	1Nos	1Nos

(As many sheets as required should be used to accommodate all items)



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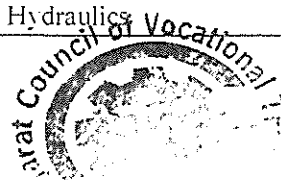
Name of Syllabus: Operation and Maintenance of Road Construction Equipments

Sector: Construction Equipment Sector

Terminal Competency: On successful completion of training one should be able to carry out Maintenance & repair of mining machineries and road constructions equipments.

Sr. No.	PRACTICAL	THEORY
1.		<p>INDUCTION & SAFETY TRAINING</p> <p>Description of safety equipment. their use. safety rules to be observed in a Road Construction Equipments workshop. Accident. their causes. Up keep of fire extinguishers. Familiarization of the tools and machinery available in the shop and machinery available in the shop there use and keep. Importance of cleanliness of work spot. tools. jacks. Trays etc.</p> <p>Importance of safety & general precautions to be observed in the shop. Fire extinguisher used for different types of fires. Storing and handling of inflammable materials. Elementary First Aid.</p>
2.	<p>STUDY OF TOOLS. MEASURING INSTRUMENTS & HARDWARE</p> <p>Learn to use Scale. Vernier caliper. Micrometer. Pressure Gauge. Torque Wrench etc.</p>	<p>STUDY OF TOOLS. MEASURING INSTRUMENTS & HARDWARE</p> <p>Ability to identify & use the right kind of Tools. Measuring Instrument & Measuring. Purpose. Types. Correct use & application of various Fasteners. Tools & Special Tools. Measuring Instruments (Electrical & Mechanical), Seal. Seal kits. O-Ring. Lubricants. Fuels. Coolants & Sealants. Gear. Gear Boxes. Bearings. Springs. V-Belts. Hoses. Study of measuring units.</p>
3.	<p>BASIC HYDRAULICS</p> <p>Demonstration on basic hydraulic</p>	<p>Basic hydraulics</p> <p>Basic Hydraulics</p>

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<p>system and relate them to the machine Measure flow and pressure in different circuits. Procedure for troubles shoots in hydraulic systems. and different applications.</p> <p>Identification of Different types of Hydraulic Components & Circuits. Closed and Open loop circuits. Principles of pumps. Motors. , Cylinders in Hydraulic System. Actuators. Control Valves (direction Pressure Flow). Scheduled and Preventive Maintenance practices in Hydraulic Systems. reading & understanding of Hydraulic Circuit diagrams. Symbols and application to equipment.</p>	<p>Different Components Parts and their applications with specific reference.</p> <p>Reading Hydraulic Circuit Diagrams and relating them to the Machine</p> <p>Load Sensing and Negative Control Systems. Different Hydraulic Pumps and their repairs. Difference Between closed loop and open loop Hydraulic Systems.</p> <p>Troubleshooting procedure and tips.</p> <p>Use of special tools – pressure gauge, sonic sensor</p>
<p>BASIC ELECTRICALS</p> <p>Understand the meaning of current. voltage. resistance. electric power and be able to measure those using multimeter and special tools available.</p> <p>4. Understand the significance of electric symbols with the aid of the symbol compendium and Service Manual and translate that to components on the machine.</p> <p>Use Matrix reading in a more discerning manner.</p>	<p>BASIC ELECTRICALS</p> <p>Basic electrical and how to read circuit diagrams from the Service manuals</p> <p>Basic knowledge on different electrical sensors.</p> <p>Usage of different electrical troubleshooting and repair tools.</p> <p>Information on wire harness and data busses.</p> <p>Identification of different types of Electrical components & Circuit. Operating Principles of Relays. Fuses. Wires. Solenoids. Battery. alternators. starters. switches etc. Systems. Symbols. Schematic drawing use of measuring instrument.</p>
<p>BASIC ENGINE</p> <p>5. Understand the fundamental controls used in engine on paver machine.</p> <p>Repair and troubleshoot engines using Service manual.</p> <p>Know the correct usage of the special tools.</p>	<p>BASIC ENGINE</p>

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6. Demonstration on functions of Differentials. and Differential Lock in Gear box.

ENGINE

- The correct Procedures and Selection of Proper Tools Special Tools for Dismantling. Inspection. assembling. Replacing Seals. Seal kits and O rings.
7. Dismantling and Assembling of Electronically control Engine. Identification of Parts. and Checking of Components as per Specification.

TRANSMISSION

- Dismantling and Assembling of Gear box. Identification of Parts. Checking of Components as per Specification.
8. TRACK
Dismantling and Assembling of track, Identification of Parts, Checking of Components as per Specification.

HYDRAULIC PUMP

- Dismantling and Assembling of Hydraulic Pump. Identification of Parts. Checking of Components as per Specification.
- 9.

HYDRAULIC SYSTEM

- Dismantling and Assembling of Motors. Gear Box. & Cylinders. Identification of Parts. Checking of Components as per Specification
- 10.

11. ON SITE TRAINING
Safety at Site Working on

TRANSMISSION

- Basic and Operating Principles. Identification & function of different types of Hydraulic Transmission in the paver machine
- Basic and operating principles of different types of engines, hydraulic pumps used in paver machine

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Machines.

Candidate will be able to carry out Periodic Maintenance. Trouble Shooting in Electrical, Mechanical and Hydraulic System: will be assisting Experienced Technicians in Major Overhauls of Components.

M/c Inspection, Commissioning, Mandatory Services

(100/500/1000/2000 Hrs.)

Replacement of Mechanical, Hydraulic, Electrical Components Parts

M/c Performance analysis, productivity Calculation.

Using of electrical measuring instruments, faultfinding and rectification.

Report Making

Communicating with customers, Operators, and representatives.

Information and Gathering

Understanding and Reading Manuals. (operating and service)

EXCAVATOR TRAINING STEP -

1

Detailed knowledge of the ROAD CONSTRUCTION MACHINE's design, systems and function.

12. Describe the make-up of the Electrical systems.

Perform all available test and calibration of sensor control units.

EXCAVATOR TRAINING STEP - 1

This training include operation and maintenance of the machine, and the design of their Hydraulic and electrical systems.

Description of

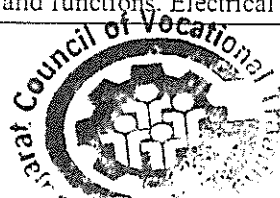
Electrical control systems and sensor functions, reading of diagram. Also, Practical training in adjusting pressure and troubleshooting in the electrical systems. Description and function of optional equipment.

ROAD MACHINERY

13. Practical training in adjusting pressure and trouble shooting of electrical and vibration system. Use of special features on pavers and

Operation and maintenance of the machine. The concept of vibration system and design. Description of vibration control unit features and functions. Electrical and hydraulic system.

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<p>13. ROAD MACHINERY Practical training in adjusting pressure and trouble shooting of electrical and vibration system. Use of special features on pavers and their application in Asphalt. Perform all available tests and calibration</p>	<p>ROAD MACHINERY Operation and maintenance of the machine. The concept of vibration system and design. Description of vibration control unit features and functions. Electrical and hydraulic system. Reading of schematic diagram</p>
<p>14. COMPACTOR STEP 1 TRAINING Trouble shooting with simulation of problems on the machine related to hydraulic and electrical system. Follow -up classroom review session for detailed understanding on "What how and Why" Concept.</p>	<p>COMPACTOR STEP 1 TRAINING Diagnose and rectify faults in logical manner using circuits to minimize down time. Enhance technical skill and problem solving competence level. Intimate knowledge on hydraulic, Electrical and Mechanical Systems.</p>

*Practical may be conducted in the industry as well as onsite.

Signature:

• Rakesh Prajapati

R.H. Prajapati

• Dharmendra Brahmhatt

Dharmendra

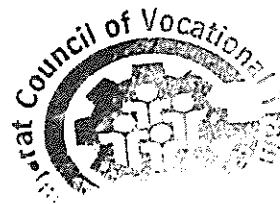
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*By
Head, J.P.P
Gandhinagar*