

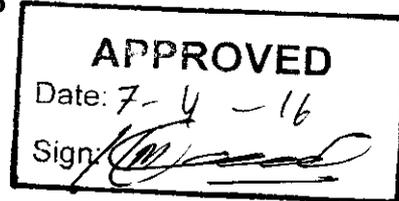
GOVERNMENT OF THE PUNJAB
TECHNICAL EDUCATION & VOCATIONAL
TRAINING AUTHORITY



CURRICULUM FOR
GENERATOR REPAIR MECHANIC

(6 – Months Course)

Revised April 2016



CURRICULUM SECTION
ACADEMICS DEPARTMENT

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TRAINING OBJECTIVES

In present day conditions, when load shedding has affected the working of life up to a larger extent, generators are the important Electro-Mechanical devices, which are providing some resistance against power failure and resulting stoppage of important home appliances and industrial machinery etc.

It is pertinent to mention that there was no formal course of any duration catering this sector, prior to this one. The course under reference will help a lot to produce the semi skilled manpower in this field possessing concepts of Construction of Generators, Diagnose the technical problems of various parts, whether electrical or auto related, and Servicing and trouble shooting of the same along with Functional English and Information Technology.

CURRICULUM SALIENTS

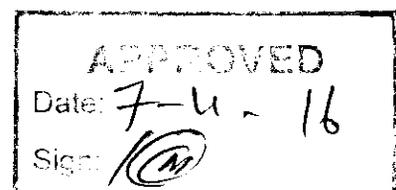
Name of the course	Generator Repair Mechanic
Entry Level	Middle preferably Matric
Duration of Course	6 – Months
Total Training Hours	800 Contact Hours
Training Methodology	Practical 80% Theory 20%
Medium of Instruction	Urdu / English



SKILL PROFICIENCY DETAILS

On successful completion of the course, is trainee should be able to: -

1. Use the hand and workshop tools accurately and safely.
2. Remove, check and refit the engine mechanical parts.
3. Perform maintenance of A.C Diesel Generator regarding electrical side.
4. Diagnose and service the related Engine systems including cooling, lubrication & ignition system.
5. Perform the Inspection & adjustment of Generator



KNOWLEDGE PROFICIENCY DETAILS

On the successful completion of the course the trainee should be able to: -

1. Explain and apply safety rules in workshop
2. Describe various types of tools and fasteners used in workshop.
3. Explain purpose construction and types of cooling, lubricating fuel and ignition system.
4. Understand construction of generators and its Electrical controls
5. Describe the Inspection & adjustment of Generator

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SCHEME OF STUDIES
Generator Repair Mechanic
(6 – Months Course)

S. No.	Main Topics	Theory Hours	Practical Hours	Total Hours
1.	Basic knowledge	15	85	100
2.	Engine	61	334	395
3.	Electrical	40	75	115
4.	Trouble Shooting of Generator	20	50	70
5.	I.T Fundamentals	8	32	40
6.	Functional English	16	64	80
Total		160	640	800

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DETAIL OF COURSE CONTENTS**Generator Repair Mechanic
(6 – Months Course)**

S. No.	Detail of Topics	Theory Hours
1.	<p>Basic Knowledge</p> <p>1.1. Safety</p> <p>1.1.1 Personal Safety</p> <p>1.1.2 Job safety</p> <p>1.1.3 Tool Safety</p> <p>1.2. Hand Tools</p> <p>1.2.1 Fitting Tools (Spanners, Socket sets, Allen key)</p> <p>1.2.2 Measuring Tools (Vernier Caliper and Micrometer)</p> <p>1.2.3 Cutting Tools (Hacksaw and file)</p> <p>1.2.4 Electrical Tools (Ampere Meter, Multimeter, Tong tester)</p> <p>1.2.5 Workshop Tools (Bench vice, Grinder, Compressor, Drill machine, Soldering iron, Hydrometer)</p> <p>1.3 Fasteners</p> <p>1.3.1 Permanent and Temporary</p>	<p>3</p> <p>10</p> <p>2</p>

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DETAIL OF COURSE CONTENTS**Generator Repair Mechanic
(6 – Months Course)**

S. No.	Detail of Topics	Practical Hours
1	Basic Knowledge 1.1 Safety Precautions 1.2 Use of turning tools 1.3 Use of Cutting Tools 1.4 Measurements with Measuring tools 1.5 Measuring with ampere meter, Volt meter & multi meter 1.6 Use of workshop Tools 1.7 Starting, stopping of Generators,	6 14 20 20 10 10 5
2.	Engine 2.1 Fitting 2.1.1 Dismantling ,checking and refitting of engine 2.1.2 Adjusting of valve clearance 2.1.3 Setting valve timing 2.1.4 Refitting of piston rings 2.1.5 Refitting of Engine bearings 2.2 Cooling System 2.2.2 Removing and refitting Radiator 2.2.3 Testing thermostat 2.3 Fuel System 2.3.1 Replacing air filter 2.3.2 Removal of fuel tank, fuel pump 2.3.3 Carburetor service 2.3.4 Replacing Diesel Filter 2.3.5 Diesel engine timing 2.4 Ignition System 2.4.1 Maintenance of battery 2.4.2 Wiring up ignition system 2.4.3 Replacing c. b point 2.4.4 Setting ignition timing 2.4.5 Magneto ignition service 2.4.6 Spark plug service 2.5 Lubricating System 2.5.1 Oil and filters change 2.5.2 Service of oil pump 2.5.3 Checking oil gauge 2.6 Starting system 2.6.1 Removal ,checking and refitting of starting motor	20 20 20 20 20 34 50 50 50 50
3.	Electrical 3.1 Use of Ampere meter 3.2 Use of Volt meter 3.3 Use of ohm meter 3.4 Use of tong tester	10 10 10 10

	3.5 Verification of Ohm ,s law and Faraday's law	10
	3.6 Demonstrating Electromagnetism	10
	3.7 Dismantling checking and assembling of Generator	10
	3.8 Checking load	05
4.	Trouble shooting	
	4.1 Engine trouble shooting and remedies	25
	4.1.1 Diagnosing	
	4.1.2 Fuel	
	4.1.3 Lubrication	
	4.1.4 Cooling	
	4.1.5 Ignition system	
	4.2 Diagnosing Generator troubles	25
	Total	544

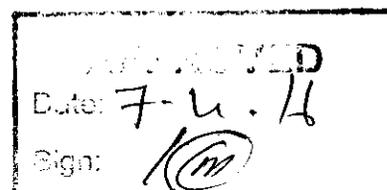
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LIST OF PRACTICAL'S**Generator Repair Mechanic**

S. No.	Detail of Topics
1	Basic Knowledge 1.8 Safety Precautions 1.9 Use of turning tools 1.10 Use of Cutting Tools 1.11 Measurements with Measuring tools 1.12 Measuring with ampere meter, Volt meter & multi meter 1.13 Use of workshop Tools 1.14 Starting, stopping of Generators,
2.	Engine 2.1 Fitting 2.1.1 Dismantling ,checking and refitting of engine 2.1.2 Adjusting of valve clearance 2.1.3 Setting valve timing 2.1.4 Refitting of piston rings 2.1.5 Refitting of Engine bearings 2.2 Cooling System 2.2.2 Removing and refitting Radiator 2.2.3 Testing thermostat 2.3 Fuel System 2.3.1 Replacing air filter 2.3.2 Removal of fuel tank, fuel pump 2.3.3 Carburetor service 2.3.4 Replacing Diesel Filter 2.3.5 Diesel engine timing 2.4 Ignition System 2.4.1 Maintenance of battery 2.4.2 Wiring up ignition system 2.4.3 Replacing c. b point 2.4.4 Setting ignition timing 2.4.5 Magneto ignition service 2.4.6 Spark plug service 2.5 Lubricating System 2.5.1 Oil and filters change 2.5.2 Service of oil pump 2.5.3 Checking oil gauge 2.6 Starting system 2.6.1 Removal ,checking and refitting of starting motor
3.	Electrical 3.1 Use of Ampere meter 3.2 Use of Volt meter 3.3 Use of ohm meter 3.4 Use of tong tester 3.5 Verification of Ohm ,s law and Faraday's law 3.6 Demonstrating Electromagnetism 3.7 Dismantling checking and assembling of Generator

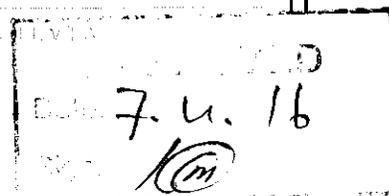
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	3.8 Checking load
4.	Trouble shooting 4.1 Engine trouble shooting and remedies 4.1.1 Diagnosing 4.1.2 Fuel 4.1.3 Lubrication 4.1.4 Cooling 4.1.5 Ignition system 4.2 Diagnosing Generator troubles



SCHEME OF STUDIES**I.T. Fundamentals**

S.No	Main Topics	Theory Hours	Practical Hours	Total Hours
1.	Introduction to Computers	2	6	8
2.	Typing - Microsoft Word	4	14	18
3.	Internet & Electronic Mail	2	12	14
Total		8	32	40



DETAIL OF COURSE CONTENTS
I.T Fundamentals

S. No	Detail of Topics	Theory Hours	Practical Hours
1	<p>Introduction to Computers</p> <p>1.1 What is a computer- Definition, functions and general features?</p> <p>1.2 What is Hardware –</p> <p style="padding-left: 20px;">1.2.1 Computer parts and units</p> <p style="padding-left: 40px;">1.2.1.1 Input Unit - Keyboard, Mouse etc.</p> <p style="padding-left: 40px;">1.2.1.2 Central Processing Unit</p> <p style="padding-left: 40px;">1.2.1.3 Output Unit</p> <p>1.3 What is Software –</p> <p style="padding-left: 20px;">1.3.1 Electronic Parts of a Pc it is</p> <p style="padding-left: 40px;">1.3.1.1 Software and Its types</p> <p style="padding-left: 40px;">1.3.1.2 System Software, Application software and its functions</p> <p>1.4 Working with windows Operating System</p> <p style="padding-left: 20px;">1.4.1 How does windows desktops work?</p> <p style="padding-left: 20px;">1.4.2 Setting desktop, background and wall papers etc.</p> <p style="padding-left: 20px;">1.4.3 Viewing directories – List of files and folders different styles.</p> <p>1.5 What are the Icons, Shortcuts and other graphic,</p> <p style="padding-left: 20px;">1.5.1 How to see computer contents on different drives etc.</p>	2	6
2	<p>Typing and Word processing (MS Word)</p> <p>2.1 Proper way of typing correct and speedy - getting familiar with the keys</p> <p>2.2 Where to type in computer? How to save a file? How to get it back? Where to find your saved work?</p> <p>2.3 Formatting in MS Word Bold, Italic, page setup, setting shades and colors.</p> <p>2.4 Working with saved work, opening and moving files.</p> <p>2.5 How to get it printed?</p>	4	14

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3	Emailing and Internet Surfing	2	12
	3.1 How to go to Internet, what is required for an internet connection etc.		
	3.2 How to use email? How to search on web? Etc		
	3.3 How to make new email account, login and logout an email account etc.?		
	3.4 Downloading and uploading attachments etc.		
Total		8	32

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LIST OF PRACTICALS
I.T Fundamentals

S. No.	Name of Practical
1.	Turn On/Off and setting of power supply
2.	Accessing The Desktop
3.	Using of Icons and Shortcuts
4.	Setting / customizing the desktop
5.	Viewing the contents of computer – Directory
6.	Setting the view of a folder
7.	Copying, Deleting and Moving Files in a folder
8.	Working with different Applications
9.	Opening MS Word for typing
10.	First lesson of Typing A S D F
11.	Second Lesson of typing J K L ;
12.	Third Lesson U I O P
13.	Fourth Lesson R E W Q
14.	Fifth Lesson N M , .
15.	Sixth Lesson V C X Z
16.	Seventh Lesson All letter using R index Finger
17.	Eighth Lesson All letter using L index Finger
18.	Formatting in MS Word Bold, Italic etc.
19.	Page Setting/ Page Layout
20.	Using Internet
21.	Opening Email, making new account
22.	Sending Receiving Emails
23.	Downloading and uploading attachments etc.

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DETAIL OF COURSE CONTENTS
Functional English

S. No	Detail of Topics	Theory Hours	Practical Hours
1	Use of past indefinite tense 1.1 Describing past events	2	6
2	Use of 'was' 'were' ' questions and negatives	2	6
3	Explaining a situations/ analysis 3.1 Making a plan 3.2 Visiting factory area 3.3 Giving justifications	2	6
4	Communication in writing 4.1 Asking for list of stationery items 4.2 Submitting report of performance of team of technicians 4.3 Submitting joining report	2	6
5	Comprehension: practice sets	2	6
6	Job application/C.V.	1	6
7	Dialogues	1	9
8	Understand vocabulary	1	3
9	Writing complaints/ answers to complaints	1	9
10	Interviews	2	7
Total		16	64

LIST OF PRACTICALS
Functional English

S. No.	Practical
1.	Group discussion
2.	Interviews
3.	Role play

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LIST OF LABS

Generator Repair Mechanic

- Auto Diesel Lab
- Electrical Lab

I.T Fundamentals

- Computer Lab

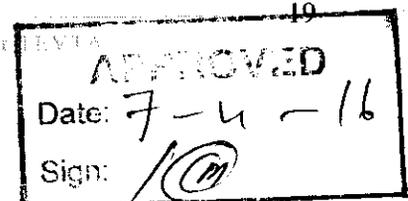
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LIST OF TOOLS / MACHINERY & EQUIPMENT

(For a class of 25 students)

Name of Trade	Generator Repair Mechanic
Duration of Course	6 – Months

Sr. No.	Name of Tools / Machinery & Equipment	Quantity
1.	Open end spanner set (6-32 mm)	05 Nos.
2.	Ring end spanner set (6-32 mm)	05 Nos.
3.	Allen key set socket set (1.5-10mm)	05 Nos.
4.	Socket set (8-32 mm)	05 Nos.
5.	Torque Wrench (micrometer type) (10-500N)	02 Nos.
6.	Adjustable wrench (1')	05 Nos.
7.	Oil filter wrench	05 Nos.,
8.	Flat screw driver (blade length)	05 Nos., 8 Nos., 10 Nos.
9.	Philips screw driver blade length (4', 6', 8', 12')	05 each
10.	Lock Plier (8')	05 Nos.
11.	Nose Plier (8')	05 Nos.
12.	Vice grip plier (8")	05 Nos.
13.	Combination slip plier (8')	05 Nos.
14.	Nose plier	05 Nos.
15.	File with handle (flat size) (150 to 300 mm)	25 Nos.
16.	Scraper	05 Nos.
17.	Ball peen hammers (1Kg.)	03 Nos.
18.	Rubber Hammer	03 Nos.
19.	Hand Hacksaw frame (300mm)	25 Nos.
20.	Punch set	05 Nos.
21.	Grease gun	01 No.
22.	Oil can	05 Nos.
23.	Steel rule (30cm)	05 Nos.
24.	Piston ring expander	02 Nos.
25.	Piston ring compressor (3 mm)	05 Nos.



26.	Valve compressor	05 Nos.
27.	Bearing puller	05 Nos.
28.	V-block	10 Nos.
29.	Adjustable jack stands.	04 Nos.
30.	Bench vice (4')	25 Nos.
31.	Work Bench, steel (6'x21/2'x23/4)	05 Nos.
32.	Tool Box (empty)	05 Nos.
33.	Jumper cables	02 set
34.	Parts tray (12'x10')	05 Nos.
35.	Vernier caliper (150mm)	25 Nos.
36.	Out side micrometer (0-1, 1-3, 0-100mm)	05 each 25 Nos.
37.	Feeler gauge (0.05-1.00mm)	05 Nos.
38.	Digital Multi-meter	05 Nos.
39.	Ignition timing light	03 Nos.
40.	Bench grinder (8')	03 Nos.
41.	Pedestal Drill machine (fixed)	02 Nos.
42.	Hand drill machine	01 No.
43.	Air compressor	01 No.
44.	Generator-(5-KVA)	01 No.
45.	Engine compression gauge	2 Nos.
46.	Vacuum gauge	2 Nos.
47.	AVO meter	2 Nos.
48.	Tong tester	2 Nos
49.	Ampere Meter	2 Nos
50.	Speedo Meter / RPM Meter (Digital System)	2 Nos
51.	Battery Charger	1 No
52.	Hydrometer	2 Nos
53.	Soldering Iron (75 w)	2 Nos

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COMPUTER LAB

S. No.	Tools / Equipment	Quantity
1.	Desktop computer (Specifications as per notification issued by MIS Section, TEVTA)	26 (1 for each student & 1 for the teacher)
2.	Printer (Laser)	01
3.	Scanner	01
4.	Internet Connection (At least 1 MB speed)	01
5.	UPS 10 KVA	01
6.	Air Conditioner 1 ½ Ton	02
7.	Multimedia Projector	01

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LIST OF CONSUMABLE MATERIALS

(For a class of 25 students)

Name of Trade	Generator Repair Mechanic
Duration of Course	06 – Months

Sr. No.	Name of Consumable Material	Quantity
1.	Engine oil for two stroke and four stroke engine	20 Liters
2.	Oil Filter	06 Nos.
3.	Petrol Filter	06 Nos.
4.	Cotton Waste	5 Kg
5.	Kerosene oil	10 Liters
6.	Lubricating oil	05 Liters
7.	Coolant for radiator	05 Liters
8.	Spark Plug	04 Nos.
9.	CB Point	02 Nos.
10.	Diesel	100 Liters
11.	Petrol	100 Liters
12.	PVC insulated single core cable 7/0.029"	01 Coil
13.	Circuit Breaker 16A, two pole	02 Nos.
14.	Circuit Breaker 63 A, three pole	02 Nos.

Functional English

S. No.	Item	Quantity
1.	Stationary	As per requirement
2.	Board Markers	As per requirement

I.T Fundamentals

S. No.	Item	Quantity
1.	Printing Paper	As per requirement
2.	Printer Toner	As per requirement

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REFERENCE BOOKS

Generator Repair Mechanic

1. Generator Repair Mechanic Published by TEVTA

Functional English

1. High School English Grammar By Wren & Martin
2. Oxford English Grammar

I.T Fundamentals

1. Introduction to Computer by Peter Norton
2. 2007 Microsoft® Office System Step by Step by Joyce Cox, Steve Lambert and Curtis Frye
3. Internet and E-mail with Windows 7 by Studio Visual Steps

MINIMUM QUALIFICATION OF INSTRUCTOR

- DAE Auto & Diesel Technology

OR

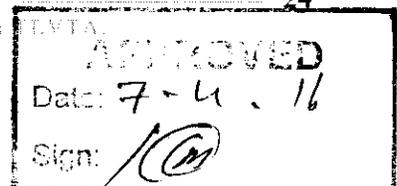
- Two years Trade Proficiency certificate in Auto & Diesel Technology along with 5 years relevant experience

Functional English

- M.A (English)

I.T Fundamentals

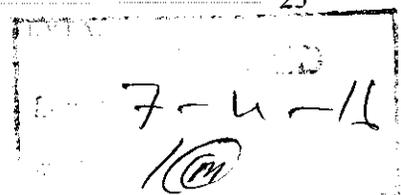
- DAE CIT/ BCS from HEC recognized university



EMPLOYABILITY OF PASS-OUTS

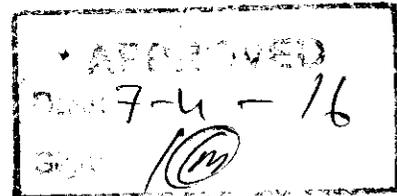
The pass outs of this course may find the job / employment opportunities in the following areas / sectors: -

1. Private sector.
2. Self Business.
3. Different Public Sector Organizations.



LIST OF TRADE RELATED JARGON**General Vocabulary Words**

Bradawl	سوا	Magnitude	مقدار
Capacitance	ظرفیت	Making	بنانا
Checking	جانچنا	Measurement	پیمائش
Components	حصے	Multiplication	ضرب
Conductance	ایصالیت	Parallel	متوازی
Conductivity	کرنٹ گزارنے کی صلاحیت	Percentage	فی صد
Conductor	موصل	Plier	پلاس
Connecting	جوڑنا	Power	طاقت
Consumer	صارف	Principle	اصول
Current	برقی رو	Protective Device	حفاظتی آلہ
Cutting	کٹنا	Removing	ختم کرنا
Decimal	اعشاریہ	Resistance	مزاحمت
Diagram	شکل	Resistivity	مزاحمت کی صلاحیت
Energy	توانائی	Reversing	سمت تبدیل کرنا
Equipment	آلات	Scissor	قینچی
Faults	نقص	Screw Driver	پیچ کس
Files	ریتی	Semi-Conductor	نیم موصل
First Aid	ابتدائی طبی امداد	Series	سلسلہ وار
Fixing	لگانا	Soldering	ٹانکا لگانا
Hacksaw	لوہا کاٹنے والی آری	Specific Resistance	مزاحمت مخصوصہ
Hammer	ہتوڑا	Structure	ساخت
Handling	کنٹرول	Tools	اوزار
Identification	شناخت	Tracing	تلاش کرنا
Installation	لگانا	Tri square	گنیا
Insulation	حاجز تہہ	Understanding	سمجھنا
Insulation Remover	حاجز تہہ اتارنے والا آلہ	Vernier Caliper	ورنیئر کیلیپر
Insulator	حاجز	Voltage	وولٹیج
Magnet	مقناطیس	Work	کام



SPECIFIC VOCABULARY WORDS

Adjustment	ایڈجسٹمنٹ	Ignition System	ایگنیشن کا نظام
Alternating Current	متغیر کرنٹ	Inspection	جانچنا
Assembling	جوڑنا	Kinetic Energy	حرکی توانائی
Auto Mobile	گاڑی	Knowledge	علم
Battery Charger	بیٹری چارجر	Laying	بچھانا
Bench Vice	بانک	Lubrication System	نظام چکنائی
Chain Hoist	چین کپی	Magnet	مقناطیس
Check Up	جانچنا	Reciprocating	متقافی
Cooling System	نظام ٹھنڈا ک	Refitting	دوبارہ جوڑنا
Combustion	اختراک	Replacing	تبدیل کرنا
Commutator	کاموٹیٹر	Rusting	زنگ آلودگی
Construction	ساخت	Starting System	سٹارٹنگ کا نظام
Cylinder Head	سلنڈر ہیڈ	Spanner	پانا
Direct Current	یکساں کرنٹ	Socket	گوٹی
Divider	پرکار	Technical	تکنیکی
Electrical System	برقی نظام	Thread	چوڑی
Friction	رگڑ	Trouble Shooting	نقص کی درستگی
Fuel Feed Pump	لقتی پمپ	Turbo Charger	ٹربو چارجر
Fuel System	فیول کا نظام	Valve Mechanism	والو میکانیزم
Hydrometer	ہائڈرو میٹر	Viscosity	گاڑھا پن

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Curriculum Revision Committee

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