



Trainer Guide

AUTOMOTIVE ELECTRICIAN

LN AUT VSE AEL AL/RW L4 ENG VER 1.00

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Foreword

LabourNet is a social enterprise that creates sustainable benefits for workers in the informal sector, by taking an end to end solution focused on plugging gaps in the eco-system to the market, to address all the challenges faced by the unorganized sector workforce today. It is observed that there is lot of scope for employment in the automotive sector particularly in vehicle servicing sub sector for candidates who possess the necessary knowledge and skills. In vehicle servicing sub sector there is dearth of trade man power in electrical servicing. To fill this gap this course on Automotive Electrician is created to upgrade the skills of practicing electrician in automotive industry for becoming eligible for higher wages and better standard of living.

This course is designed for the training model known as instructor led. Trainee will be provided the knowledge inputs through lecture either in the class room or at the garage premises followed by practical training at the center with available facilities and at the garage as on the job training.

This course for automotive electrician is in general aligned Qualification Pack for automotive electricians vide Reference ID: ASC/Q 1408 published by NSDC and covers all the operations carried out by an electrician attending four wheelers on the roads in India. Servicing of technologically advanced four wheelers such as vehicles with automatic systems, transmissions, vehicles with latest technologies pertaining to engine such as fuel cell technology and intelligent navigation and transport systems

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Course Details

Course Name	Automotive Electrician
Course Code	LN AUT VSE AEL AL/RW L4 ENG VER 1.00

This course is designed for up grading the knowledge and basic skills to take up the job of 'Automotive Electrician' in 'Automotive Industry' sector. All the activities carried out by an automotive electrician are covered in this course. Upon successful completion of this course the candidate will be eligible to work as automotive service technician.

This course is designed to provide the necessary knowledge and skill inputs for a technician to work in an organized and disciplined manner by following safe working practices, good housekeeping, effective communication, documentation and work ethics. Knowledge inputs are provided through interactive lectures and other training methodologies such as demonstration, group discussion, role play and other activities to ensure effective learning. The methodology followed to impart the skill in service and repair of vehicle is 'practical training' under guidance. Formative assessment is carried out by the trainer as per the schedule in the assessment guide and summative assessment is carried out by external assessor.

Courseware consists of the following as per NSDC quality guidelines.

- Curriculum
- Trainers Guide
- Participants Guide
- Assessment Guide
- Training Delivery Plan
- Training Aids

Further Learning Opportunities:

Upon successful completion of this course the candidate will be eligible for attending advanced courses on Automotive Electrician.

1. Key Competencies

Upon successful completion, the Learners will be able to:

1. Carryout overhauling of engine management system such as fuel cell, remote diagnostics, CRDI, drive by drive, close loop system, etc. following the SOP.
2. Carryout overhauling of braking system such as ABS, etc. following the SOP
3. Carryout overhauling of electrical wire harness such as lighting, ignition and AC system following the SOP
4. Maintain work area clean and tidy
5. Work effectively in a team
6. Follow safety precautions while servicing

Course Duration					
No. of Days	30 days				
No. of Hours Per day (hrs)	4 hrs	Total No. Hours (GLH)	120 hrs	Theory	40 hrs
				Practical	80 hrs
Total No. Hours (Assessment)			4 hrs	Theory	
				Practical (OJT)	-

*Refer Assessment Guide for actual hours. Maximum 2 hours allotted for Formative Assessment and 2 hours for Summative Assessment.

Eligibility Criteria	
Age	18 years
NVEQF/NVQF level	4
Minimum Educational Qualifications	ITI
Maximum Educational Qualifications	Diploma in Electrical/Automobile Engineering
Experience	0 years for ASDC Automotive Electrician Level 4 certificate or diploma in Electrical/Automobile Engineering or 2-5 years for other qualification

2. Module wise duration

Module Wise Duration				
Sl.No	Module Name	Guided Learning Hours (GLH)		
		Training		
		Theory	Practical	OJT
1	Overview on Automotive industry and generic skills	5 hrs	-	-
2	Carryout electrical and electronic repair and overhauling of a vehicle	20 hrs	55 hrs	-
3	Plan and organize work to meet expected outcomes	4 hrs	10 hrs	-
4	Work effectively in a team	5 hr	5 hrs	-
5	Maintain a healthy, safe and secure working environment	6 hr	10 hrs	-
Total		40 hrs	80 hrs	-
		120 hrs		
Total GLH		120 hrs		
Total Duration		*124 hrs		

*Refer Assessment Guide for Maximum 2 hours allotted for Formative Assessment and 2 hours for Summative Assessment.

3. Training Centre Requirements

Physical Requirements

1. Room to accommodate 15 Trainees.
2. Black Board/White Board with writing and erasing materials.
3. Display stand for learning cards/Flipcharts
4. Computer and Projector for Power Point presentation (Optional).

Teaching Materials	LabourNet provides the following material to the Centres.
	<ul style="list-style-type: none"> • Curriculum • Power point presentation/learner cards/Flip Chart • Trainers Guide • Participant Guide • Assessment Guide

Trainers Qualification	Diploma in Electrical engineering or Degree in Electrical engineering with 2/4 years experience with exposure to Automotive Electrician.
Evaluation team	Separate team form LabourNet with qualified and experienced personnel.

Suggested Tools and Equipment list for Training (Mandatory)

SI	TOOLS/ EQUIPMENT	SPECIFICATION	Maker
1	Hammer ball peen	0.75 kg	Lie nielsen
2	Screw driver blade	20 cm. x 9 mm	Red rooster
3	Screw driver blade	30 cm x 9 mm	Red rooster
4	Spanner D E set of 12 pieces	6mm to 32 mm	Unique enterprises
5	Pliers combination	15 cm	Sareko tools and forging
6	Hand file. Second cut	20 cm	Nicholson
7	Centre punch	10 mm dia x 100 mm	Harbor Freight Tools
8	Chisel cold flat	20 mm	Harbor Freight Tools
9	Ring spanner set of 12 pieces	6 to 32 mm	Unique enterprises
10	Feeler gauge	20 blades (metric)	SKF
11	Steel tool box with lock & key (folding type)	size 400x200x150mm	Gobal sources
12	Allen Key set of 12 pieces	2 mm to 14 mm	Bombay tools centre
13	Philips Screw Driver Type set of 5 pieces	100 mm to 300 mm	Red rooster
14	Steel Rule	30 cm, English and metric	Lee valley tools
15	Prick punch	15 cm	Harbor Freight Tools
16	Scriber with scribing block universal	15 cm	Rdg tools
17	Hacksaw frame adjustable for	30 cm blade	Sethi brother
18	Hand vice	37mm	Mukesh trading company
19	Stud remover	STANDARD	Atd tools
20	Taps and Dies complete set in a box with handle (metric)	STANDARD	Harbor Freight Tools
21	Hand reamer adjustable	10.5 to 11.25 mm, 11.25 to 12.75 mm, 12.75 to 14.25 mm and 14.25 to 15.75 mm	Bonney tools
22	Dial indicator	Can able read 0.01 mm	hi tech tool industry
23	Outside Micrometer	0-25 mm, 25-50 mm, 50-75mm, 75-100 mm	swatic industry
24	Mallets	wooden/plastic	Mukesh trading company
25	Piston ring filer	STANDARD	HI industries
26	Spanner, ring offset	set of 6 (Metric)	garg sports international
27	Spanner, .	adjustable 20 cm	hi tech tool industry
28	Spanner for spark plugs	14 mm	Unique enterprises
29	Socket Spanners with handle, T bar & ratchet	STANDARD	Bonney tools
30	Oil can cap	0.5 liter	Vintage mobil handy

			oil
31	Cleaning Tray.	45 x 30 cm	Porstmouth
32	Work bench	250 x 120x60 with 4 bench	Mobile tool cart black
33	Ring ridge remover	STANDARD	Standard
34	Pullers screw	powered 2 mm with bearing puller attachment	Standard
35	Vice grip pliers	STANDARD	Kobalt
36	Circlip pliers	Expanding and contracting type 15cm and 20 cm each	Bombay tools centre
37	Inspection lamp with guard	STANDARD	standard
38	Hollow punch set	seven pieces 6 to 15 mm	Vardhamman die and moulds
39	Valve spring Compressor	STANDARD	Forge mech
40	Tool valve grinding, suction type	STANDARD	complete with guidesand pilot bar (all angles) in a box
41	Valve seat cutting tools	complete with guidesand pilot bar (all angles) in a box	gauge capacity 50 to 150 mm
42	Cylinder bore	gauge capacity 50 to 150 mm	60 x 60 cm
43	Surface Plate	60 x 60 cm	75 x 38 mm pair with Clamps
44	"V" Block	75 x 38 mm pair with Clamps	(6mm -17 mm) Set of 12 nos
45	Spanner off set double ended set of 7 pieces.	(6mm -17 mm) Set of 12 nos	0 to 115kg/sq cm
46	Compression testing gauge to read	0 to 115kg/sq cm	STANDARD
47	Piston Ring compressor & Ring Expander	STANDARD	To read up to 5000 rpm
48	Tachometer	To read up to 5000 rpm	12 V
49	Battery	12 V	250 or 200 mm inside, outside & depth
50	Vernier Caliper	250 or 200 mm inside, outside & depth	STANDARD
51	DMM Auto range	STANDARD	STANDARD
52	Hydrometer	STANDARD	12 mm dia
53	Drilling machine bench to drill	12 mm dia	two 18 cm wheel
54	Electric pedestal grinder	two 18 cm wheel	STANDARD

4. Instructions for Trainee

1. During training all trainees are expected to conduct themselves as per norms and regulations of the company wherein you are undergoing training.
2. Trainees should maintain punctuality in respect of attendance.
3. Trainee should be in the class before the training scheduled time.
4. No leave will be granted to the trainees during training session, except under emergent circumstances.
5. Trainees must put their mobile phone in “Switch Off/ Silent” mode during training session inside Theoretical class room and as well as in Practical Lab.
6. Make sure you are neatly attired and presentable at all times.
7. Be attentive in classroom, especially when trainer demonstrates a task/process/work.
8. Always participate in discussion and activities.
9. Always take safety measures and necessary precautions while doing any practical using equipment and tools.
10. Always make appropriate notes, space is provided for the same at the end of each module.
11. Do not hesitate to ask any doubts and questions. Our trainer will help and support you in best possible way.
12. Revise and practice as many times as possible.
13. In case of any clarification, Training Section may be contacted during working hours on working days.
14. Study the activities before the session starts so that your active participation and learning are assured.

Assessment: At the end of the module the trainer should administer test provided by the assessment team as described in the Assessment Guide

Resources:

- Pen
- Instructor
- Practical resources provided by instructor and training center.

4. General Instructions for Trainers

Pre training:

- Trainer is provided with the training content for reference. For e.g. the topics you have to train in this programme.
- Before leaving for the training site Trainer should make sure that the trainees have been informed about the training.
- Trainers should make sure they have route map to reach the training site without any difficulties.
- By any chance if Trainer is getting delayed make sure that he/she should inform the site supervisor that you are getting delayed.
- As soon as the Trainer reaches the training site he/she should meet training coordinator/supervisor (to make sure of the training facilities are available-onsite, offsite).
- Please make sure you have all the required training tools and materials for conducting the training session (learning cards, sketch pens, raw materials etc.).
- Check your training equipments such as laptop, projector and camera, relevant tools (depending on the training site).
- Reach 15 minutes before to arrange for the training session

During the training

- Start the session with an icebreaker to settle the participants for the session.
- Welcome and Recap the previous days learning s and clarify the doubts if any.
- Mark attendance for the trainees at the beginning and the end of the training
- Follow the session plan strictly.
- Encourage the trainees to ask questions, explore ideas etc.

Close the session with positive strokes

Specific instructions for Trainers - Course

- Use case stories (live examples) pertaining to the respective course training.
- Stop and check in between the sessions whether the learners are learning!!

- Ask the participants to draw a simple action plan with respect to the course to implement the learning's from the days training programme.
- Use current version of the curriculum/training package linked from the Course training manual of **LabourNet course page**.
- Ensure the delivery and assessment strategies are consistent with those outlined in the Course **Training and Assessment Strategy**
- Discover how to Anchor positive states to gestures, words and pictures pertaining to Course trade during the onsite training.
- Appropriate paper based document repository with respect to course should be used.
- Assess group and individual needs verbally (actively listening) and/or in writing.
- Establish trustworthiness with the group.
- Establish ground rules and/or reiterate them as needed, modelling and promoting protection of confidentiality, demonstrating consideration for other's feelings, and acknowledging occasions when trainees may have unintentionally broken a ground rule or offended someone.
- Acknowledge in advance possible feelings or differences of opinion that a session may generate.
- Trainers should get away from unclear thinking and unclear structure before they start the presentation.
- Trainers must communicate effectively with any audience, energy, voice and body to enhance presence, reputation and power.
- Become less dependent upon content and script, freeing up your creativity and passion!

Post training:

- **Share/Report the observations found in the training site with the concerned person (coordinator/supervisor)**
- Record on-going formative assessment results

5. Session Plan for each Module

Module 1- Overview of automotive industry and generic skills

Module Overview

This module covers basics concepts to work as an automotive electrician, generic skills and engineering workplace skills.

Module Objectives

By completing this module the trainee would be able to:

- Explain the evolution and growth of 4 wheeler
- Classify automobile based on
 - Purpose
 - Fuel used
 - Capacity
 - Drive
 - Wheel and axel
 - Suspension
 - Transmission
- Explain the growth of 4-wheeler industry
- Describe the opportunities of automotive electrician in an industry
- Describe role of automotive electrician in an industry
- Communicate effectively
- Listen effectively
- Write a professional resume and applying through various job related portals
- Describe work ethics
- Describe the grooming standards at the work place

Underpinning Knowledge/ Theory/ Principle

- No prior knowledge is required

Module Design

Session no.	Session Topics	Method	Duration	Training Aids/ Tools/Equipment
1.	Introduction to automotive industry and automotive electrician	Interactive lecture/Icebreaker	3 hrs	PPT, PPE, Paper, Pen and Newspaper
2.	Work place skills	Interactive lecture, group activity – writing, role play, reading	2 hrs	
TOTAL			5 hrs	

Session Plan 1- Introduction to automotive industry and automotive electrician

Session Objectives

By completing this module the trainee would be able to:

- Explain the evolution and growth of 4 wheeler
- Classify automobile based on
 - Purpose
 - Fuel used
 - Capacity
 - Drive
 - Wheel and axel
 - Suspension
 - Transmission
- Explain the growth of 4-wheeler industry
- Describe the opportunities of automotive electrician in an industry
- Describe role of automotive electrician in an industry

Duration

S.no.	Sub – Topics	Duration	
		Theory	Practical
1.1	Introduction to 4 wheeler	3 hrs	-
1.2	Evolution and growth of 4 wheeler segment		
1.2	Introduction to factory/section		
1.4	Role of automotive electrician		

TOTAL	3 hrs	-
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Instructions to the Trainer

- Follow instructions given in the activity section
- Ensure all the task is done in sequence as given
- Gather all the materials and information required in well advance
- Keep the class energetic and motivated to learn

Tips for Trainer

- Be energetic while introducing yourself to the trainees.
- Be aware of the timing required to complete the activity
- Training materials should be used at the right time and in the right way
- Maintain the flow of the module from start to finish
- Making sure that the Trainees are comfortable and eager to learn.

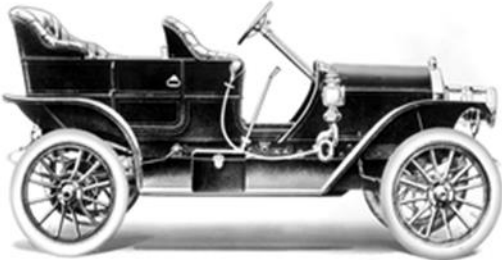
Slide No.4-15

Introduction to Automobile

Introduction to Four wheeler

The era of “Automobile” starts in the mid of 17th and 18th century, strictly speaking, in 1760s. In the beginning “steam engine automobile” was created for the means of human transport.

- ▶ Later on an internal combustion engine is used for a self-propelled vehicle to transport passengers and goods too.
- ▶ Examples: Car, etc.



Activity 1

Objective: To impart knowledge on automotive industry and job related activities as an automotive electrician.

Methodology:

Interactive Lecture covering the following

- Overview on automotive industry

- Classification of automobiles
- Growth of automotive industry
- Roles of automotive electrician

Material required: PPT, Paper, Pen and Newspaper

Outcome: The trainee will be able to describe the importance and scope of the automotive industry and roles and responsibilities of an automotive electrician.

Session Plan 2 – Work place skills

Session Objectives

At the end of the session, participants will be able to:

- Communicate effectively
- Listen effectively
- Write a professional resume and applying through various job related portals
- Describe work ethics
- Describe the grooming standards at the work environment

Duration

S.no.	Sub – Topics	Duration	
		Theory	Practical
2.1	Oral communication	2 hrs	-
2.2	Reading and comprehension skills		
2.3	Writing skills		
2.4	Work ethics and professionalism		
2.5	Analytical thinking		
2.6	Customer Service		
TOTAL		2 hrs	

Instructions to the Trainer

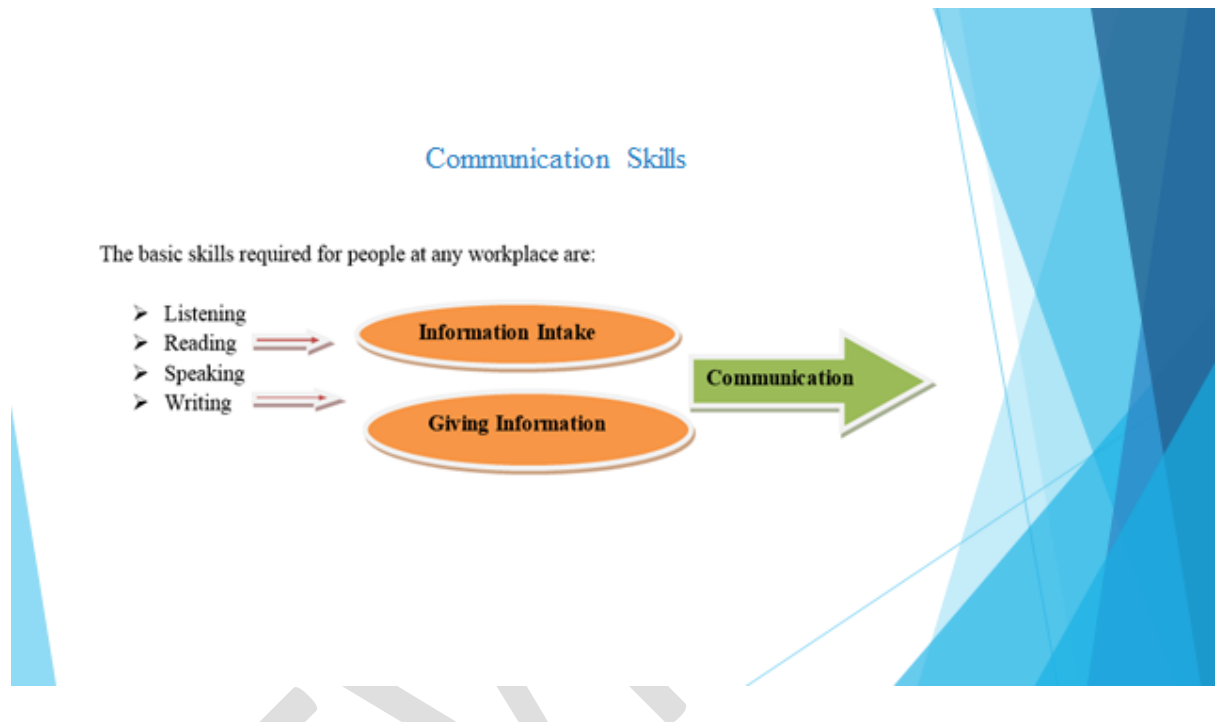
- Follow instructions given in the activity section
- Ensure all the task is done in sequence as given
- Gather all the materials and information required in well advance
- Keep the class energetic and motivated to learn

Tips for Trainer

- Be energetic while introducing yourself to the trainees.

- Be aware of the timing required to complete the activity
- Training materials should be used at the right time and in the right way
- Maintain the flow of the module from start to finish
- Making sure that the Trainees are comfortable and eager to learn.

Slide No.16-33



Activity 1

Objective: To provide basic information on communication skills and work ethics to the trainees

Methodology:

Interactive Lecture covering the following

- Communication: oral and writing
- Reading skills and tips to enhance the reading
- Work ethics and professionalism

Material required: PPT

Outcome: The trainee will be able to communicate effectively and describe work ethic

Debrief:

The trainer will recap by asking one of the participants to the duties of automotive electrician

Assessment

1. List out few roles of automotive electrician?
2. Explain different forms of communication?

Module 2- Carry out electrical and electronic repairs and overhauling of vehicle

Module Overview

This module covers skills required of an individual to carry out repairs and overhauling of electronic and electrical systems of a vehicle

Module Objectives

By completing this module the trainee would be able to:

- Describe Electricity
- Define insulator, conductor, semi-conductor, voltage and atom
- Explain current flow theories
- Describe fuel injection system and its types
- Describe Air Conditioning System
- Explain Steering system
- Explain the working principle of brake system
- Describe Suspension system and its types
- Describe and identify Safety systems in a vehicle
- Identify components in Clutch System
- Demonstrate battery service
- Service starter motor
- Identify and solve trouble shootings in fuses and lighting system
- Demonstrate Servicing of charging system
- Describe A/C system
- Rectify and repair trouble shootings in A/C system

Underpinning Knowledge/ Theory/ Principle

- Evolution and growth of 4 wheeler
- Classify automobile based on
 - Purpose
 - Fuel used
 - Capacity
 - Drive
 - Wheel and axel
 - Suspension
 - Transmission
- Growth of 4-wheeler industry

- Role of automotive electrician in an industry
- Communicate effectively
- Listen effectively
- Work ethics

Module Design

Session no.	Session Topics	Method	Duration	Training Aids/ Tools/Equipment
1	Basics of electrical and electronics	Interactive lecture	5 hrs	Paper, pen, PPT, Learner Cards, mobile, Side Cutting Pliers, Flat Nose Pliers, Round Nose Pliers, Slip joint pliers, Slip joint, Multi grip Pliers, Circlip Pliers, Locking Pliers, C-clamp, Feeler gauge, Battery hydrometer, Post lift, Multi-meter, Pneumatic gun
2	Vehicle Management System	Interactive lecture, Identification and Group discussion	25 hrs	
3	Hand tools and Power tools	Interactive lecture, demonstration and identification	7 hrs	
4	Repair and Overhaul	Interactive lecture, Group discussion and demonstration	38 hrs	
TOTAL			75 hrs	

Session Plan 1 – Basics of electrical and electronics

Session Objectives

By completing this module the trainee would be able to:

- Describe Electricity
- Define insulator
- Define conductor
- Define semi-conductor
- Define voltage
- Describe Atom
- Explain current flow theories

Duration

S.no.	Sub – Topics	Duration	
		Theory	Practical
1.1	Electricity	5 hrs	-

1.2	Current flow theories		
1.3	Components in electronics		
1.4	Types of Diodes and their Uses		
TOTAL		5 hrs	

Instructions to the Trainer

- Follow instructions given in the activity section
- Ensure all the task is done in sequence as given
- Gather all the materials and information required in well advance
- Keep the class energetic and motivated to learn

Tips for Trainer

- Be energetic while introducing yourself to the trainees.
- Be aware of the timing required to complete the activity
- Training materials should be used at the right time and in the right way
- Maintain the flow of the module from start to finish
- Making sure that the Trainees are comfortable and eager to learn

Slide No. 35-42

Basics of electrical and electronics

- ▶ Electricity
- ▶ The Volt
- ▶ The Ampere
- ▶ The Ohm
- ▶ The Atom
- ▶ Electrical Charges
- ▶ Balanced Atoms
- ▶ Ion Particles
- ▶ Insulators
- ▶ Conductors
- ▶ Semiconductors

Activity 1

Objective: To provide basic information on electrical and electronics

Methodology:

Interactive Lecture covering the following

- Principle of Electricity and Electronics
- Current flow theories
- Components in Electronics
- Types of diodes and their uses

Material required: PPT

Outcome: The trainee will be able to describe basics of electrical and electronics

Session Plan 2 – Vehicle Management System

Session Objectives

By completing this module the trainee would be able to:

- Describe engine and its functions
- Identify engine components
- Describe fuel injection system and its types
- Describe Air Conditioning System
- Explain Steering system
- Explain the working principle of brake system
- Describe Suspension system and its types
- Describe Safety systems
- Identify components in Clutch System
- Identify and explain the various components in brake system
- Identify Active and Passive safety system in a vehicle

Duration

S.no.	Sub – Topics	Duration	
		Theory	Practical
2.1	Engine	5 hrs	20 hrs
2.2	Fuel injection system		
2.3	Air conditioning system		
2.4	Transmission (Gear box)		
2.5	Brake system		
2.6	Suspension system		
2.7	Safety system		
TOTAL		25 hrs	

Instructions to the Trainer

- Follow instructions given in the activity section

- Ensure all the task is done in sequence as given
- Gather all the materials and information required in well advance
- Keep the class energetic and motivated to learn

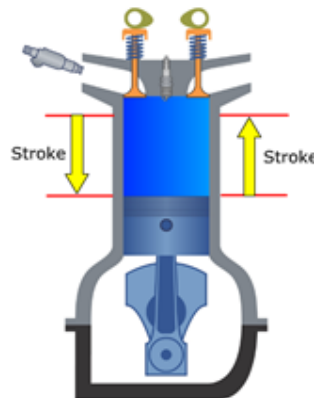
Tips for Trainer

- Be energetic while introducing yourself to the trainees.
- Be aware of the timing required to complete the activity
- Training materials should be used at the right time and in the right way
- Maintain the flow of the module from start to finish
- Making sure that the Trainees are comfortable and eager to learn

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Engine

- ▶ Function of the engine is to produce power
- ▶ The entire process of burning the fuel and generating power in the engine is completed in 4 steps or 4 strokes which gives it a name of 4-stroke engine
- ▶ Piston travel from top dead center to bottom dead center or bottom dead center to top dead center is called stroke



Activity 1

Objective: To impart the knowledge on vehicle management system

Methodology:

Interactive Lecture covering the following

- Engine and its components
- Fuel injection system
- Gear box (Transmission) and its types
- Steering System
- Suspension System

- Safety Systems

Material required: PPT

Outcome: The trainee will be able to describe functions of various components in vehicle management system

Activity 2

Objective: To impart the skill on petrol and diesel engine

Methodology:

Group Discussion

Material required: PPT,

Outcome: The trainee will be able discuss the difference between petrol and diesel engine.

Activity 3

Objective: To identify and describe the functions of various components of an engine

Methodology:

Identification

Material required: PPT, Engine and its components

Outcome: The trainee will be able to identify and describe functions of various components of an engine.

Activity 4

Objective: To identify and describe the functions of various components of clutch and gear box system

Methodology:

Identification

Material required: PPT, Clutch, Gear box and Disassembled components of clutch and gear box

Outcome: The trainee will be able to identify and describe the functions of various components of clutch and gear box.

Activity 5

Objective: To identify and explain the functions of various components of a brake system

Methodology:

Identification

Material required: PPT, Charts and demo car

Outcome: The trainee will be able to identify and describe the functions of various components of brake system.

Activity 6

Objective: To identify various active and passive safety systems in the given vehicle

Methodology:

Identification

Material required: PPT, Demo car

Outcome: The trainee will be able to identify various active and passive safety systems in the given vehicle

Session Plan 3 – Hand tools and Power tools

Session Objectives

At the end of the session, the trainee will be familiarizing:

- With various tools used and its working procedure.
- To identify right tool required for a particular operation.
- With various equipment, feature and its operating/working procedure

Duration

S.no.	Sub – Topics	Duration	
		Theory	Practical
3.1	Hand tools	2 hrs	5 hrs
3.2	Power tools		
TOTAL		7 hrs	

Instructions to the Trainer

- Follow instructions given in the activity section
- Ensure all the task is done in sequence as given
- Gather all the materials and information required in well advance
- Keep the class energetic and motivated to learn

Tips for Trainer

- Be aware of the timing required to complete the activity
- Training materials should be used at the right time and in the right way
- Maintain the flow of the module from start to finish
- Making sure that the Trainees are comfortable and eager to learn.

Slide No. 81-99



Activity 1

Objective: To impart the knowledge on Hand tools and power tools

Methodology:

Interactive Lecture on following

- Hand tools
- Power tools

Material required: PPT.

Outcome: The trainee will be able to describe various hand tools and power tools used in an industry by an automotive service technician.

Activity 2

Objective: Identifying various hand tools and power tools.

Methodology:

Identification

Material required: PPT, Hand tools and power tools.

Outcome: The trainee will be able to identify various hand tools and power tools.

Activity 3

Objective: To impart the skill to carryout drilling operation.

Methodology:

Demonstration

Material required: PPT, portable drilling machine, PPE, sample work piece.

Outcome: The trainee will be able to drill holes in the given work piece using drilling machine.

Activity 4

Objective: To demonstrate testing of battery using hydrometer.

Methodology:

Demonstration

Material required: PPT, Hydrometer and battery

Outcome: The trainee will be able to check battery condition using hydrometer.

Session Plan 4 – Repair and Overhaul

Session Objectives

By completing this module the trainee would be able to:

- Describe battery and its importance
- Carryout battery service
- Service starter motor
- Identify and solve trouble shootings in fuses and lighting system
- Service charging system
- Describe A/C system
- Rectify and repair trouble shootings in A/C system

Duration

S.no.	Sub – Topics	Duration	
		Theory	Practical
4.1	Repair and Overhauling of electrical components	8 hrs	30 hrs
TOTAL		42 hrs	

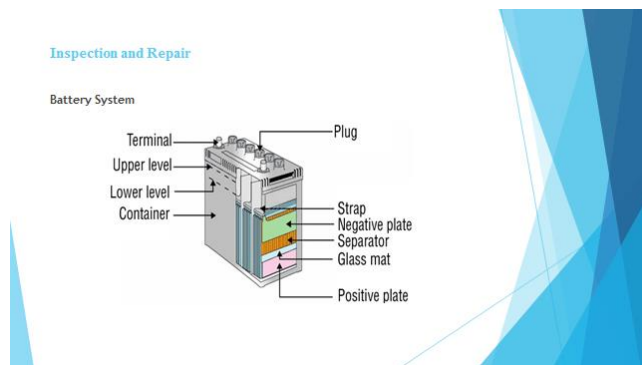
Instructions to the Trainer

- Follow instructions given in the activity section
- Ensure all the task is done in sequence as given
- Gather all the materials and information required in well advance
- Keep the class energetic and motivated to learn

Tips for Trainer

- Be aware of the timing required to complete the activity
- Training materials should be used at the right time and in the right way
- Maintain the flow of the module from start to finish
- Making sure that the Trainees are comfortable and eager to learn.

Slide No. 100-142



Activity 1

Objective: To impart the knowledge on electrical systems and components

Methodology:

Interactive Lecture on following

- Battery.
- Starter motor
- Lighting and fuses
- Charging system
- A/C system

Material required: PPT.

Outcome: The trainee will be able to describe importance of electrical systems and components

Activity 2

Objective: To impart the skill on servicing battery

Methodology:

Demonstration

Material required: PPT, PPE, Battery, Charging unit and Hydrometer

Outcome: The trainee will be able to service battery wearing PPE

Activity 3

Objective: To demonstrate servicing of starter motor

Methodology:

Demonstration

Material required: PPT, PPE, starter motor and Spanner.

Outcome: The trainee will be able to service starter motor wearing PPE

Activity 4

Objective: To impart the skills on identifying and repairing faults in fuses and lighting system

Methodology:

Demonstration

Material required: PPT and PPE.

Outcome: The trainee will be able to identify and repair faults in fuses and lighting system

Activity 5

Objective: To impart skills on servicing charging system

Methodology:

Demonstration

Material required: PPT, Alternator, Multi-meter and PPE.

Outcome: The trainee will be able to service charging system

Activity 6

Objective: To demonstrate serving of A/C system

Methodology:

Demonstration

Material required: PPT, PPE and Demo car

Outcome: The trainee will be able to service A/C system wearing PPE

Debrief:

The trainer will recap by asking the participants to demonstrate the overhauling of electronic and electrical systems of a vehicle

Module 3- Plan and organize work to meet expected outcome

Module Overview

This module introduces the trainee about planning and organizing an individual's work in order to complete it to the required standards, on time and within budget in terms of cost and material.

Module Objectives

By completing this module the trainee would be able to:

- Maintain work area clean and tidy
- Manage time, materials and cost effectively
- Follow organization's policies and procedures
- Obtain guidance from seniors when necessary

Underpinning Knowledge/ Theory/ Principle

- Evolution and growth of 4 wheeler
- Classification of automobiles
- Growth of 4-wheeler industry
- Role of automotive electrician in an industry
- Communicate and listen effectively
- Electricity
- Insulator, conductor, semi-conductor, voltage and atom
- Current flow theories
- Fuel injection system and its types
- Air Conditioning System
- Steering system
- Working principle of brake system
- Suspension system and its types
- Safety Systems
- Servicing Battery, Starter motor, Charging System, Fuses, Lighting System and A/C system

Module Design

Session no.	Session Topics	Method	Duration	Training Aids/ Tools/Equipment
1	Planning and Organizing	Interactive lecture, demonstration	14 hrs	Paper, pen, PPT and charts
TOTAL			14 hrs	

Session Plan 1 – Planning and Organizing**Session Objectives**

By completing this module the trainee would be able to:

- Maintain work area clean and tidy
- Manage time, materials and cost effectively
- Follow organization's policies and procedures
- Obtain guidance from seniors when necessary

Duration

S.no.	Sub – Topics	Duration	
		Theory	Practical
1.1	Planning	4 hrs	10 hrs
1.2	Organizational skills		
1.3	Policies and Procedures		
TOTAL		14 hrs	

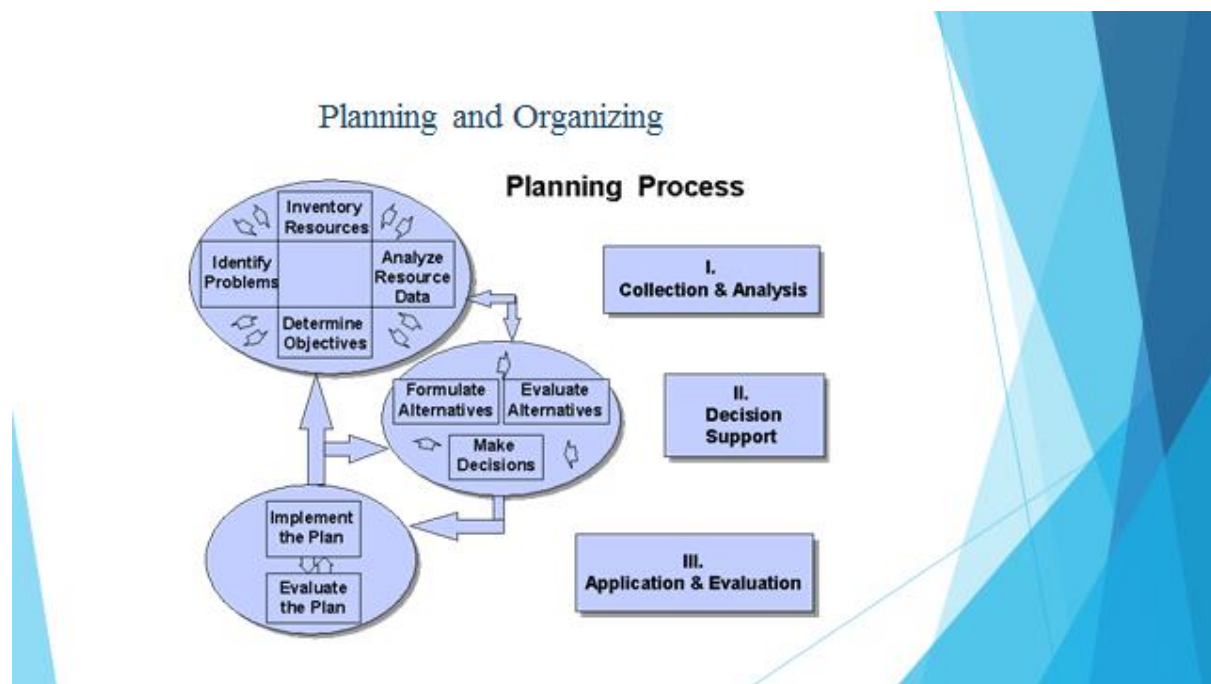
Instructions to the Trainer

- Follow instructions given in the activity section
- Ensure all the task is done in sequence as given
- Gather all the materials and information required in well advance
- Keep the class energetic and motivated to learn

Tips for Trainer

- Making sure that the Trainees are comfortable and eager to learn.
- Starting the session with an Energizer
- Be aware of the timing required to complete the activity
- Training materials should be used at the right time and in the right way.
- Maintaining the flow of the module from start to finish.

Slide No. 143-150

**Activity 1**

Objective: To impart the knowledge on planning, organizing and its importance

Methodology:

Interactive Lecture

- Planning
- Planning process
- Organizing

Material required: PPT.

Outcome: The trainee will be able to describe planning, organizing and its importance at workplace

Activity 2

Objective: To demonstrate the importance of Planning, organizing, Policies and Procedures of an organization

Methodology:

Demonstration and Group Discussion on following

- Importance of planning
- Importance of organizing
- Advantages of planning
- Policies and procedures

Material required: PPT

Outcome: The trainees will be able to demonstrate the importance of Planning, organizing, Policies and procedures of an organization.

Activity 3

Objective: To demonstrate planning process used in an organization

Methodology:

Demonstration

Material required: PPT

Outcome: The trainees will be able to carry-out planning for a particular operation in an organization

Debrief:

The trainer will recap by asking the trainees to

Assessment

1. What is planning and List out its advantages?
2. List the different type of planning you come across in automotive service facility.
3. Write a note on Organizational skills.

Module 4 -Work effectively in a team

Module Overview

This module introduces the trainee about working effectively with colleagues, either in own work group or in other work groups within organization.

Module Objectives

By completing this module the trainee would be able to:

- Follow clear communication with colleagues
- Plan and coordinate with colleagues
- Work effectively in a team

- Follow organization's policies and procedures
- Work with colleagues for achieving team objectives

Underpinning Knowledge/ Theory/ Principle

- Evolution and growth of 4 wheeler
- Classification of automobiles
- Growth of 4-wheeler industry
- Role of automotive electrician in an industry
- Communicate and listen effectively
- Electricity
- Insulator, conductor, semi-conductor, voltage and atom
- Current flow theories
- Fuel injection system and its types
- Air Conditioning System
- Steering system
- Working principle of brake system
- Suspension system and its types
- Safety Systems
- Servicing Battery, Starter motor, Charging System, Fuses, Lighting System and A/C system
- Manage time, materials and cost effectively
- Organization's policies and procedures

Module Design

Session no.	Session Topics	Method	Duration	Training Aids/ Tools/Equipment
1	Working with colleagues	Interactive lecture, group discussion and demonstration	10 hrs	PPT
TOTAL			10 hrs	

Session Plan 1– Working with Colleagues

Session Objectives

By completing this module the trainee would be able to:

- Follow clear communication with colleagues
- Plan and coordinate with colleagues
- Work effectively in a team

- Follow organization’s policies and procedures
- Work with colleagues for achieving team objectives

Duration

S.no.	Sub – Topics	Duration	
		Theory	Practical
1.1	Coordinating with colleagues	5 hrs	5 Hrs
1.2	Planning and Coordination		
1.3	Work Effectively in a Team		
1.4	Plan and organize work to achieve targets and deadlines		
1.5	Policies and Procedures		
TOTAL		10 hrs	

Instructions to the Trainer

- Follow instructions given in the activity section
- Ensure all the task is done in sequence as given
- Gather all the materials and information required in well advance
- Keep the class energetic and motivated to learn

Tips for Trainer

- Be energetic while introducing yourself to the trainees.
- Be aware of the timing required to complete the activity
- Training materials should be used at the right time and in the right way
- Maintain the flow of the module from start to finish
- Making sure that the Trainees are comfortable and eager to learn.

Slide No.152-161

Working with Colleagues

► In every organization once work it is commenced continuous monitoring is done to ensure that the work is completed as per the schedule. Worker i.e.; yourself, who is directly carrying out the task has the right information and the trainer will train you in preparing the status report as per the formats provided

Typical Status Report as on(date)(time)			
Task	Start Time(date)(time)	Completion time.....(date)(time)	% of completion (shade %)
Tasks	Description	Completed Not completed..... (tick mark)	
1			
2			
3			
4			

Activity 1

Objective: To provide knowledge on team work, effective communication and its importance

Methodology:**Interactive Lecture**

- Planning and coordination
- Team work
- Communication skills
- Policies and Procedures

Material required: PPT, Paper and Pen

Outcome: The trainee will be able to explain the importance of team work and effective communication

Activity 2

Objective: To discuss the importance of team work at workplace

Methodology:**Group Discussion and Role Play on following**

- Importance of team work
- Advantages of working in a team

Material required: PPT

Outcome: The trainees will be able to discuss the importance of team work at workplace

Activity 3

Objective: To discuss the importance of planning and organizing to achieve targets and deadlines

Methodology:**Group Discussion and Role Play on following**

- Planning and Organizing

Material required: PPT

Outcome: The trainees will be able to discuss the importance of planning and organizing

Debrief:

The trainer will recap by asking participants to explain the importance of team work and effective communication

Module 5-Maintain a healthy, safe and secure working environment

Module Overview

This module is about monitoring the working environment and making sure it meets requirements for health, safety and security.

Module Objectives

By completing this module the trainee would have gained knowledge about:

- Follow organization's current health, safety, security and environmental policies and procedures
- Define hazard
- Describe various hazards and safety precautions to be followed while servicing
- Follow organization's emergency and disaster management procedures
- Identify and recommend opportunities for improving health, safety and security

Underpinning Knowledge/ Theory/ Principle

- Evolution and growth of 4 wheeler
- Classification of automobiles
- Role of automotive electrician in an industry
- Communicate and listen effectively
- Electricity
- Insulator, conductor, semi-conductor, voltage and atom
- Current flow theories
- Fuel injection system and its types
- Air Conditioning System
- Steering system
- Working principle of brake system
- Suspension system and its types
- Safety Systems
- Servicing Battery, Starter motor, Charging System, Fuses, Lighting System and A/C system
- Manage time, materials and cost effectively
- Organization's policies and procedures
- Plan and coordinate with colleagues
- Team work
- Organization's policies and procedures

Module Design

Session no.	Session Topics	Method	Duration	Training Aids/ Tools/Equipment
1	Health and safety	Interactive lecture, group discussion and demonstration	16 hrs	PPT, PPE
TOTAL			16 hrs	

Session Plan 1 – Health, safety and security requirements**Session Objectives**

At the end of the session, the trainee will be able to:

- Follow organization's current health, safety, security and environmental policies and procedures
- Define hazard
- Describe various hazards and safety precautions to be followed while servicing
- Follow organization's emergency and disaster management procedures
- Identify and recommend opportunities for improving health, safety and security

Duration

S.no.	Sub – Topics	Duration	
		Theory	Practical
1.1	Health and Safety	6 hr	10 hrs
TOTAL		16 hrs	

Instructions to the Trainer

- Follow instructions given in the activity section
- Ensure all the task is done in sequence as given
- Gather all the materials and information required in well advance
- Keep the class energetic and motivated to learn

Tips for Trainer

- Be energetic while introducing yourself to the trainees.
- Be aware of the timing required to complete the activity
- Training materials should be used at the right time and in the right way
- Maintain the flow of the module from start to finish
- Making sure that the Trainees are comfortable and eager to learn.

Slide No 163-185

Health and safety

A hazard is a situation that poses a level of threat to life, health, property, or environment

Automotive jobs in the workshop involves – adjusting wheel alignment, checking engine performance, checking charging systems, adjusting engine valves and many other jobs. These jobs do include variety of hazards each day, from contact with hazardous chemicals to the possibility of amputating limbs or digits with mechanical equipment

Activity 1

Objective: To impart the knowledge on maintaining health, safety and security at workplace

Methodology:

Interactive Lecture followed by group discussion

- Personal protective equipment (PPE)
- Non-authorized / restricted areas
- Protective safety requirements
- Hazards and safety from machinery

Material required: PPT and PPE

Outcome: The trainee will be able to explain the importance of maintaining health, safety and security at workplace

Activity 2

Objective: To demonstrate the evacuation process in case of any health threat at workplace

Methodology:

Demonstration

Material required: PPT and PPE

Outcome: The trainee will be able to carry-out the evacuation process of any health threat at workplace

Activity 3

Objective: To demonstrate wearing of PPE.

Methodology:

Demonstration

- Demonstration will take place in classroom

Material required: PPT and PPE

Outcome: The trainee will be able to use PPE effectively

Activity 4

Objective: Identification of safety and hazard signs

Methodology: Each trainee will be asked to explain one of the hazard signs

Material required: Various safety and hazards signs.

Outcome: Identify hazards and safety signs at work and determine the appropriate safety measures that should be followed to avoid any accidents.

Debrief:

The trainer will recap by asking participants to explain the importance of maintaining health, safety and security at workplace