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ASDC™
AUTOMOTIVE SKILLS DEVELOPMENT COUNCIL

Facilitator Guide



Sector
Automotive

Sub-Sector
Manufacturing

Occupation
Assembly Operation

Reference ID: ASC/Q3608, Version-1.0
NSQF Level: 4

Automotive Assembly Technician

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Developed by:

Automotive Skills Development Council (ASDC)

ASDC Contact Details:

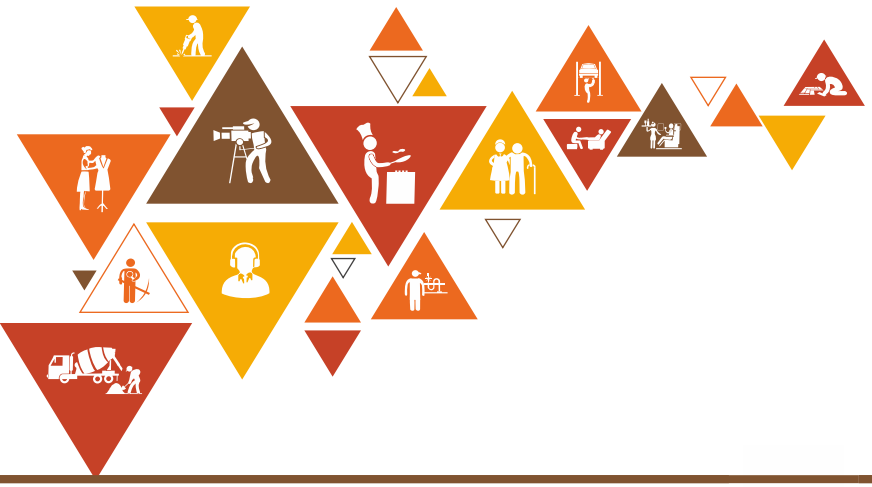
Leela Building, 153 GF, Industrial Area,

New Delhi, Delhi 110020

Email: info@asdc.org.in

Website: www.asdc.org.in

Phone: 011 4186 8090



"Skilling is building a better India. If we have to move India towards development then Skill Development should be our mission."

Shri Narendra Modi
Prime Minister of India

Acknowledgements

Automotive Skill Development Council (ASDC) acknowledges the contribution of all the individuals and organizations who have contributed to the preparation of this "Facilitator Guide."

Without their contribution it would not have been completed. Sincere appreciation is extended to our industry partners, all experts for providing technical inputs and reviewing the individual modules.

Preparation of this manual would not have been possible without the Automotive Industry's support. Industry feedback has been extremely encouraging from inception to conclusion and it is with their input that we have tried to bridge the skill gaps existing today in the Industry.

ASDC dedicates this book to the aspiring youth of the country who desire to achieve special skills which will be a lifelong asset for their future endeavours.

About this Guide

The Facilitator Guide is designed for the Trainers to enable training for a specific job role and enhance the quality of executing the training program. This particular Facilitator Guide is designed for enabling the training program for the job role of "Automotive Assembly Technician" in the Automotive Sector.

This course is aligned to Qualification Pack, Automotive Assembly Technician, Reference ID: ASC/Q3601

This Qualification pack is developed by Automotive Skill Development Council (ASDC). This course encompasses all 4 National Occupational Standards (NOS).

Each unit starts with learning objectives, followed by relevant activities and corresponding training methodology. Upon successful completion of this course, the participant will be able to:

1. ASC/N9803: Organize work and resources (Manufacturing)
2. ASC/N9805: Interpret engineering drawing
3. ASC/N3611: Perform vehicle assembly operations

Besides, it has been endeavored to follow the facilitator guide guidelines prescribed by the National Skill Development Corporation.

Symbols Used


Key Learning Outcomes


Practical


Elaborate


Tips


Notes


Unit Objectives


Do


Explain


Say

Ask


Team Activity


Demonstrate


Observation


Facilitation Notes


Exercise


Activity


Summary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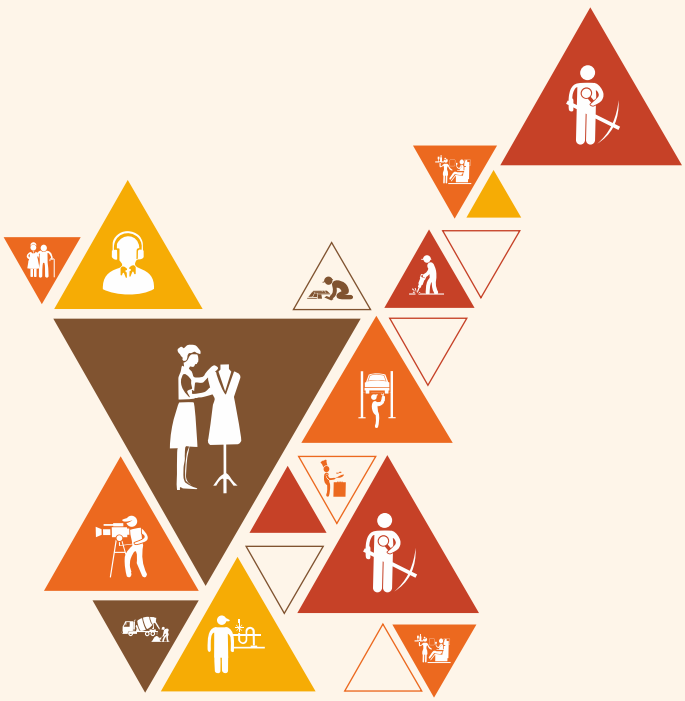
1. Introduction to the Role of an Automotive Assembly Technician

Unit 1.1 - Introduction to the Automotive Assembly Technician

Unit 1.2 - Overview of the Automotive Industry and its Market



Bridge Module

Key Learning Outcomes

At the end of this module, the trainees will be able to:

1. Discuss the role and responsibilities of an Automotive Assembly Technician

Unit 1.1 Introduction to the Automotive Assembly Technician

Unit Objectives

At the end of this unit, you will be able to:

1. Describe the role and responsibilities of an Automotive Assembly Technician
2. List the job opportunities for an Automotive Assembly Technician

Resources to be Used

- Participant Handbook
- Paper, Pens, Notepad, Chart paper
- Computer, Projector, Flipchart
- Whiteboard, Marker, and Duster

Notes for Facilitation

- Enter the class ten minutes before the session begins.
- Welcome and greet the students.
- Take the daily attendance.
- Maintain the record of assessment scores

Do

- Begin the session with a brief recapitulation of the previous session.

Say

- Start the class by saying, "This training program is developed to impart specific knowledge and skills relevant to the job required to be performed as a "Automotive Assembly Technician", in the "Automotive Sector/Industry."
- Talk about the Qualification Pack (QP), and National Occupational Standards (NOS).
- List the compulsory NOSs to the QP "Automotive Assembly Technician".
- Say, "Before we start the program let's play a small game".

Group Activity

Objective	The purpose of this activity is to build rapport with the coursemates
Material required	Parcel (for passing)
Procedure	• Welcome the new participants by giving self introduction • Make the trainees stand in a circle, close enough to the person on each side of them so that they can pass the parcel quickly. • Say 'Stop' when it is least expected. At that time, the trainee holding the parcel introduces himself/herself while saying his/her name and a little additional information such as favourite hobbies, likes, dislikes, etc. • The winner of the game should stand and introduce himself/herself at the end of the game. • At last, thank the participants for their participation.
Conclusion	This activity helps the participants to know each other and also allows them to feel comfortable.

Say

- "I hope you all liked this small activity/game." and give a brief related today's topic what they are going to learn.

Explain

- Explain the skills required to be an automotive assembly technician with the help of Fig. 1.1 given in the Participant Handbook.
- Explain the roles and responsibilities of an assembly technician with the help of Fig.1.2 given in the Participant Handbook.
- Explain the benefits of working as an automotive assembly technician with the help of Fig.1.4 given in the Participant Handbook.

Ask

- List any three benefits of being an automotive assembly technician.
- What types of skills are required to be an automotive assembly technician?
- Can anyone tell me two important responsibilities of an automotive assembly technician?

Notes for Facilitation

- Allow one or two students to answer the questions.
- Write down the correct answer on the board.

Summarize

- Summarize the session.
- Prepare a list of participants' doubts if they have any. Encourage them to ask questions.
- Answer their queries.

Exercise

- Instruct the trainees to open their Participant Handbook and complete the exercise given in unit 1.1.
- Ensure that the participants have opened the correct page for the activity.
- Give them 20 minutes to complete the exercise.
- Exercise Hints:
  - Answers to Questions I.
    1. Hint - Refer to section 1.1.1
    2. Hint - Refer to section 1.1.1
  - Answers to Questions II.
    1. Assembly operations
    2. Automotive assembly technician, supervisor
    3. Manufacturing

Unit 1.2 Overview of the Automotive Industry and its Market

Unit Objectives

At the end of this unit, the trainee will be able to:

1. Explain about Indian automotive manufacturing market
2. List various automobile Original Equipment Manufacturers (OEMs) and different products/ models manufactured by them
3. Discuss the standard procedures involved in the different processes of assembly
4. Identify the standard checklists and schedules recommended by OEM

Resources to be Used

- Participant Handbook
- Paper, Pens, Notepad, Chart paper
- Computer, Projector, Flipchart
- Whiteboard, Marker, and Duster

Notes for Facilitation

- Enter the class ten minutes before the session begins.
- Welcome and greet the students.
- Take the daily attendance.
- Maintain the record of assessment scores

Do

- Begin the session with a brief recapitulation of the previous session.

Say

- “In the last unit, we gained an understanding of skills, roles and responsibilities of an automotive assembly technician.”
- “In today's session, we will discuss about the overview of the automotive industry and its market.”

Explain

- Explain the background of automotive industry.
- Explain the leading automotive manufacturers in India with the help of Table 1.1 given in the Participant Handbook.
- Explain the Indian automotive manufacturing market of two-wheeler vehicles with the help of Fig. 1.4 given in the Participant Handbook.
- Explain the key segments of automotive vehicles with the help of Fig.1.5 given in the Participant Handbook.
- Explain India's pre-owned vehicle market with the help of Fig.1.6 given in the Participant Handbook.

Ask

- What is the significance of automotive industry?
- What is the difference between industrial automobile vehicles and commercial vehicles?
- Can you name three leading automotive manufacturers in India?

Notes for Facilitation

- Allow one or two students to answer the questions.
- Write down the correct answer on the board.

Elaborate

- Elaborate the following topics:
  - Original equipment manufacturer (OEM) in the automotive industry and its key features (Fig 1.7)
  - OEM versus after markets (Fig.1.8)
  - Top OEMs in the automobile industry (Table1.2)
  - Standards and procedures in the different assembly processes
  - Process -flow of various assembly operations in the automotive industry (Fig 1.9)
  - Key feature and procedure of production scheduling (Fig 1.10 and 1.11)
  - Various production checklists in automotive manufacturing (Fig 1.23)

Ask

- What do you understand by OEM?
- Can you name three key features of OEM?
- What is the purpose of standard quality of AEC-Q100?
- What are the best-selling products of the Hyundai motor group and Ford automotive company?
- What is the difference between OEM and aftermarkets?
- What are production scheduling and checklists?

Notes for Facilitation

- Allow one or two students to answer the questions.
- Write down the correct answer on the board.

Summarize

- Summarize the session.
- Prepare a list of participants' doubts if they have any. Encourage them to ask questions.
- Answer their queries.

Exercise

- Instruct the trainees to open their Participant Handbook and complete the exercise given in unit 1.2.
- Ensure that the participants have opened the correct page for the activity.
- Give them 20 minutes to complete the exercise.
- Exercise Hints:
  - Answers to Questions I.
    1. Hint - Refer to section 1.2.2
    2. Hint - Refer to section 1.2.4
    3. Hint – Refer to section 1.2.1
    4. Hint – Refer to section 1.2.5

- Answers to Questions II.
  1. AEC- Q100
  2. Production scheduling
  3. Original equipment manufacturer (OEM)
  4. Industrial automotive vehicles
  5. Automotive

Scan the QR Code to watch the related video

www.youtube.com/watch?v=PJP7xVBLBL8

Introduction to Automotive Industry

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2. Organize Work and Resources According to Safety and Conservation

Unit 2.1 - Maintaining a Safe and Secure Working Environment

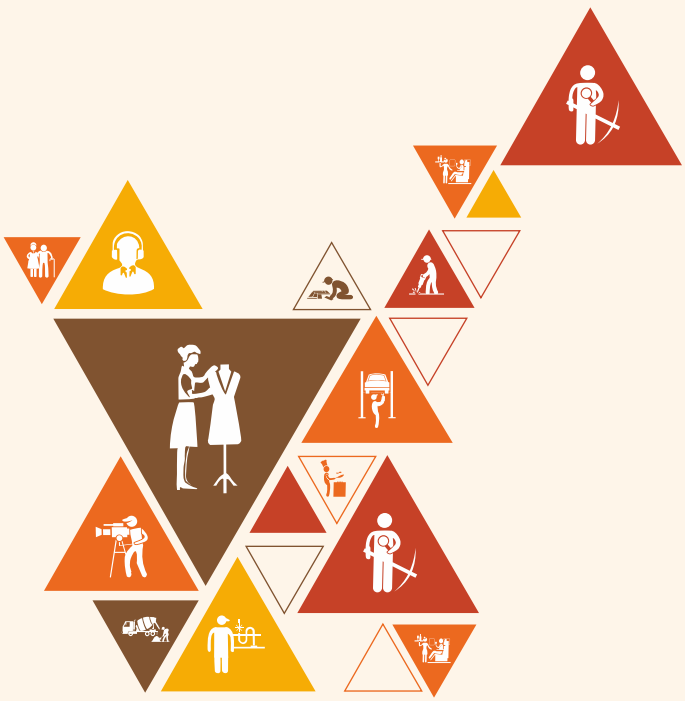
Unit 2.2 - Essential Preventive Measures while Operating Machines and Equipment

Unit 2.3 - Health and Hygiene Practices for at Workplace

Unit 2.4 - Quality Management Systems

Unit 2.5 - Waste Management in Manufacturing

Unit 2.6 - Energy Conservation Practices in Manufacturing



ASC/N9803

Key Learning Outcomes

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

1. Discuss the ways to maintain a safe and secure working environment
2. Describe the standard health and hygiene practices to be followed at the workplace
3. Perform the job activities as per quality standard
4. Adhere to effective waste management practices
5. List the material/energy conservation practices

UNIT 2.1: Maintaining a Safe and Secure Working Environment

Unit Objectives

After the completion of this unit, the participants will be able to:

1. Distinguish occupational hazards associated with CNC machining
2. Determine the factors aggravating occupational hazards

Resources to be Used

- Participant Handbook
- Paper, Pens, Notepad, Chart paper
- Computer, Projector, Flipchart
- Whiteboard, Marker, and Duster

Notes for Facilitation

- Enter the class ten minutes before the session begins.
- Welcome and greet the students.
- Take the daily attendance.
- Maintain the record of assessment scores.

Do

- Begin the session with a brief recapitulation of the previous session.

Say

- "In the last unit, we gained an understanding of the Indian automotive manufacturing market, various automobile original equipment manufacturers (OEMs) and different products/models manufactured by them, etc."
- "In today's session, we will discuss the ways to maintain a safe and secure working environment."

Explain

- Explain the importance of maintaining a safe & secure working place.
- Explain the identification of hazards in manufacturing.
- Explain five major types of hazards associated with manufacturing units with the help of Table 2.1 given in the Participant Handbook.

Say

- "A hazard is something that has the potential to cause injury, disease, or death in a workplace."
- "Aspects for the development of a safe workplace environment are development policies, the consultative process, hazard identification, and control."

Elaborate

- Elaborate the following topics:
  - Identification of hazards at workplace with the help of Fig.2.1
  - Injury for workers is higher when combined with risk factors

Ask

- List different types of hazards.
- Can anyone name three workplace risk factors?

Notes for Facilitation

- Allow one or two students to answer the questions.
- Write down the correct answer on the board.

Summarize

- Summarize the main points.
- Ask participants if they have any doubts.
- Encourage them to ask questions.
- Answer their queries satisfactorily.

UNIT 2.2: Essential Preventive Measures while Operating Machines and Equipment

Unit Objectives

After the completion of this unit, the participants will be able to:

1. Apply the rules for keeping safe while operating on machines and equipment
2. List the Do's before setting up of the machine

Resources to be Used

- Participant Handbook
- Paper, Pens, Notepad, Chart paper
- Computer, Projector, Flipchart
- Whiteboard, Marker, and Duster

Notes for Facilitation

- Enter the class ten minutes before the session begins.
- Welcome and greet the students.
- Take the daily attendance.
- Maintain the record of assessment scores.

Do

- Begin the session with a brief recapitulation of the previous session.

Say

- "In the last unit, we discussed the workplace hazards, their identification, and safety procedures."
- "Now, we will try to understand the rules for keeping safe while operating a machines and equipment."

Explain

- Explain the essential preventive measures for at workplace.
- Explain the safety rules for ensuring safety while operating machines and equipment with the help of Table 2.2 given in the Participant Handbook.

Elaborate

- Elaborate the following topics:
  - Steps to perform before operating the machines and equipment with the help of (Fig.2.2)

Ask

- Can anyone name two safety rules while operating machines and equipment?
- What are the dos before operating machines and equipment?

Notes for Facilitation

- Allow one or two students to answer the questions.
- Write down the correct answer on the board.

Summarize

- Summarize the main points.
- Ask participants if they have any doubts.
- Encourage them to ask questions.
- Answer their queries satisfactorily.

UNIT 2.3: Health and Hygiene Practices for at Workplace

Unit Objectives

After the completion of this unit, the participants will be able to:

1. Discuss the health and hygiene practices at workplace

Resources to be Used

- Participant Handbook
- Paper, Pens, Notepad, Chart paper
- Computer, Projector, Flipchart
- Whiteboard, Marker, and Duster

Notes for Facilitation

- Enter the class ten minutes before the session begins.
- Welcome and greet the students.
- Take the daily attendance.
- Maintain the record of assessment scores.

Do

- Begin the session with a brief recapitulation of the previous session.

Say

- "In the last unit, we discussed rules for keeping safe while operating machines and equipment."
- "Now, we will try to understand how to maintain hygiene at the workplace."

Explain

- Explain the dos and don'ts of general health and hygiene practices with the help of Fig.2.3 given in the Participant Handbook.

Ask

- What hygiene practices do you follow at home?
- Which of those practices can be followed at workplace too?

Notes for Facilitation

- Allow one or two students to answer the questions.
- Write down the correct answer on the board.

Summarize

- Summarize the main points.
- Ask participants if they have any doubts.
- Encourage them to ask questions.
- Answer their queries satisfactorily.

UNIT 2.4: Quality Management Systems

Unit Objectives

After the completion of this unit, the participants will be able to:

1. Define quality management system
2. Elaborate automotive quality management system and its compliance principles

Resources to be Used

- Participant Handbook
- Paper, Pens, Notepad, Chart paper
- Computer, Projector, Flipchart
- Whiteboard, Marker, and Duster

Notes for Facilitation

- Enter the class ten minutes before the session begins.
- Welcome and greet the students.
- Take the daily attendance.
- Maintain the record of assessment scores.

Do

- Begin the session with a brief recapitulation of the previous session.

Say

- "In the previous session, we discussed the rules of hygiene practices to be followed at the workplace in general."
- "Can somebody list a few of them?"
- "In today's session, we'll talk about the quality management system."

Explain

- Explain the importance of quality management system.
- Explain a well -implemented quality management system to assist the company.

Elaborate

- Elaborate the following topics:
  - IATF 16949
  - IATF 16949 seven quality management principles and compliance principles with the help of(Fig.2.4)

Ask

- What does IATF 16949 stands for?
- Can you name three quality management principles?

Notes for Facilitation

- Allow one or two students to answer the questions.
- Write down the correct answer on the board.

Summarize

- Summarize the main points.
- Ask participants if they have any doubts.
- Encourage them to ask questions.
- Answer their queries satisfactorily.

UNIT 2.5: Waste management in Manufacturing

Unit Objectives

After the completion of this unit, the participants will be able to:

1. Identify wastes in the industrial environment
2. Discuss the methods of waste minimization in manufacturing

Resources to be Used

- Participant Handbook
- Paper, Pens, Notepad, Chart paper
- Computer, Projector, Flipchart
- Whiteboard, Marker, and Duster

Notes for Facilitation

- Enter the class ten minutes before the session begins.
- Welcome and greet the students.
- Take the daily attendance.
- Maintain the record of assessment scores.

Do

- Begin the session with a brief recapitulation of the previous session.

Say

- "In the previous session, we discussed automotive quality management principles and their compliance principles."
- "In today's session, we'll talk about the wastes in the industrial environment."

Explain

- Explain the importance of waste management.
- Explain the identification of waste in the industrial environment.

Elaborate

- Elaborate waste minimalization in manufacturing with the help of(Fig.2.5)

Ask

- Can you name any three waste identified in the industrial environment?
- What is waste minimization?

Notes for Facilitation

- Allow one or two students to answer the questions.
- Write down the correct answer on the board.

Summarize

- Summarize the main points.
- Ask participants if they have any doubts.
- Encourage them to ask questions.
- Answer their queries satisfactorily.

UNIT 2.6: Energy Conservation Practices in Manufacturing

Unit Objectives

After the completion of this unit, the participants will be able to:

1. Describe the energy conservation practices at workplace

Resources to be Used

- Participant Handbook
- Paper, Pens, Notepad, Chart paper
- Computer, Projector, Flipchart
- Whiteboard, Marker, and Duster

Say

- "In the previous session, we discussed the identification of waste in an industrial environment."
- "In today's session, we'll talk about energy conservation practices at the workplace."

Explain

- Explain the importance of energy conservation efforts in manufacturing.

Elaborate

- Elaborate few steps that can be followed for achieving energy efficiency and consumption with the help of Table 2.3

Ask

- Can you name any three steps for achieving energy efficiency and consumption?

Notes for Facilitation

- Allow one or two students to answer the questions.
- Write down the correct answer on the board.

Summarize

- Summarize the main points.
- Ask participants if they have any doubts.
- Encourage them to ask questions.
- Answer their queries satisfactorily.

Exercise

- Instruct the trainees to open their Participant Handbook and complete the exercise given in Module 2.
- Ensure that the participants have opened the correct page for the activity.
- Give them 20 minutes to complete the exercise.
- ·Exercise Hints:
  - Answers to Questions I.
    1. Lack of supervision - A “Don’t” for operating machines and equipment
    2. Gloves - safety hazard
    3. Working in a confined space – sudden lack of oxygen can cause suffocation
    4. Sustained quality –the benefit of quality control
    5. Oil mist and grinding dust – health hazard
    6. Six Sigma – 3.4 defects per million
    7. Quality circles - quality control strategy
    8. Unnecessary inventory - waste
    9. LED lights – energy consumption
    10. Value stream mapping – Translate customer needs to translate
    11. Exchange waste – creates raw material for another process

- Answers to Questions II.
  1. Hint – Refer to section 2.1.2
- Answers to Questions III.
  1. Hint – Refer to section 2.2.2
  2. Hint - Refer to section 2.3.1
  3. Hint- Refer to section 2.4.1
  4. Hint – Refer to section 2.4.2

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www.youtube.com/watch?v=ANiJU50JgbM
Health and Hygiene Practices for at Workplace

www.youtube.com/watch?v=42UHIRVwxec
Waste management and its disposal

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3. Interpret Engineering Drawing

Unit 3.1 - Engineering Drawing and its Purpose

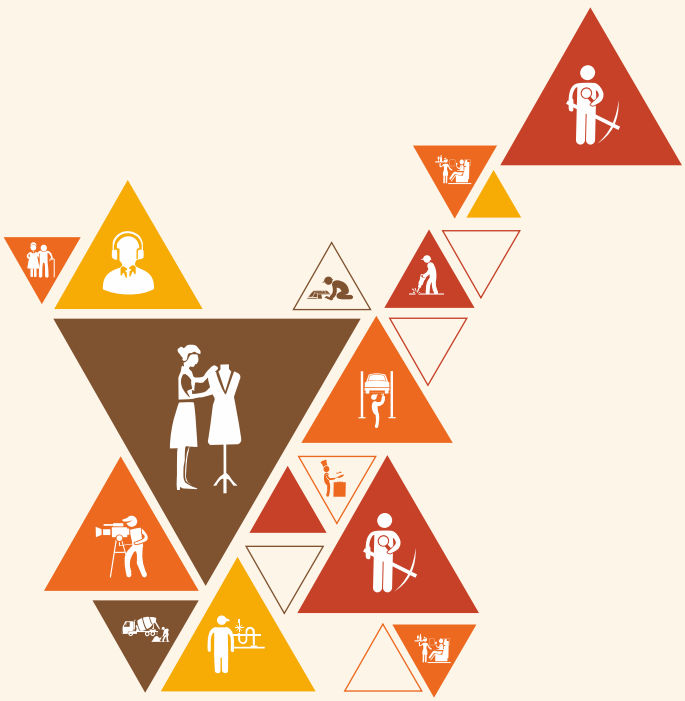
Unit 3.2 - Measurement

Unit 3.3 - Dimensions

Unit 3.4 - Basic Components of an Engineering Drawing

Unit 3.5 - Geometric Dimensioning & Tolerancing (GD&T)

Unit 3.6 - Surface Finish



ASC/N9805

Key Learning Outcomes

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

1. Differentiate between 2D and 3D shapes
2. Explain section views and projections
3. Interpret the geometric dimensioning and tolerance in a feature frame

UNIT 3.1: Engineering Drawing and its Purpose

Unit Objectives

After the completion of this unit, the participants will be able to:

1. Define engineering drawing and outline its usage

Resources to be Used

- Participant handbooks
- Paper, Pens, Notepad, Chart paper
- Computer, Projector
- Whiteboard, Marker, and Duster

Do

- Begin the session with a brief recapitulation of the previous session.

Say

- "In our previous sessions, we have discussed the communication skills required for the job of automotive machining lead technician. Today, we will start with the necessary technical knowledge of engineering drawing and its purpose."

Ask

- Can you tell different types of drawings?
- What do you understand by engineering drawings?

Notes for Facilitation

- Note down the responses on the Whiteboard given by the students.

Say

- "Let's understand how to interpret engineering drawings."

Explain

- Explain the information that engineering drawings reveal.
- Explain the format of engineering drawing with the help of Fig. 4.1 in the participant book.

Summarize

- Summarize the session by asking questions on the topics covered in the class.
- Prepare a list of participants' doubts if they have any. Encourage them to ask questions.
- Answer their queries.

UNIT 3.2: Measurement

Unit Objectives

After the completion of this unit, the participants will be able to:

1. Define measurement and its units

Resources to be Used

- Participant handbooks
- Paper, Pens, Notepad, Chart paper
- Computer, Projector
- Whiteboard, Marker, and Duster

Notes for Facilitation

- Enter the class ten minutes before the session begins.
- Welcome and greet the students.
- Take the daily attendance.
- Maintain the record of assessment scores.

Do

- Begin the session with a brief recapitulation of the previous session.

Ask

- How do you communicate in the following scenarios?
  - How far is your home from the workplace?
  - Buying sugar from the grocer
  - Buying milk from the milkman
  - What is the duration of a video?
  - How hot or cold is it in your area?

Notes for Facilitation

- Note down the responses on the Whiteboard given by the students.

Explain

- Explain the concept of measurement.
- Explain the essential physical quantities and the standard units used to measure them (Table 3.1).

Activity

Objective	The purpose of this activity is to understand the units of measurement
Material required	Whiteboard
Procedure	• Use the Whiteboard to ask a few questions on simple conversions of units. • Share a number in a particular unit and ask the participants to convert into another unit. • Call the participants one by one to the board.
Conclusion	This activity enables to understand the different units and the formulae to convert from one unit to another.

Summarize

- Summarize the session.
- Prepare a list of participants' doubts if they have any. Encourage them to ask questions.
- Answer their queries.

UNIT 3.3: Dimensions

Unit Objectives

After the completion of this unit, the participants will be able to:

1. Compare between 1D, 2D, and 3D shapes
2. Interpret the angles and axis

Resources to be Used

- Participant handbooks
- Paper, Pens, Notepad, Chart paper
- Computer, Projector
- Whiteboard, Marker, and Duster

Notes for Facilitation

- Enter the class ten minutes before the session begins.
- Welcome and greet the students.
- Take the daily attendance.
- Maintain the record of assessment scores.

Do

- Begin the session with a brief recapitulation of the previous session.

Say

- "In the previous session, we learned about the concept of measurement."
- "Today we will gain the understanding of dimensions."
- "Please concentrate on this topic and keep your questions ready, as this is of paramount importance to a machining lead technician."

Do

- Show a plain rectangular piece of paper, a dice, circular piece of paper, and a ball to the participants.

Activity

Objective	The purpose of this activity is to understand the different shapes and types of angles
Material required	Whiteboard
Procedure	• Ask questions on shapes and angles. For example: ◦ What are the different shapes? ◦ How many angles does a square have? ◦ How many angles does a triangle have? • As you talk about each shape, draw the shape on the whiteboard and mark the angles.
Conclusion	This activity explains the concept of angles.

Explain

- Explain the concepts of 1D, 2D, and 3D drawings with examples (Table 3.2)
- Explain the concept of angles and axis and how they are measured (Fig. 3.3).
- Explain the different types of angles and axis (Fig. 3.2).

Activity

Objective	The purpose of this activity is to understand the different dimensions
Material required	Whiteboard, paper, dice, circular piece of paper and a ball.
Procedure	Divide the Whiteboard into 4 columns and ask them to come one by one and list the characteristics or properties of the four items shown to them, on the Whiteboard.
Conclusion	This activity explains the concept of 1D, 2D and 3D.

Notes for Facilitation

- Note down the responses on the Whiteboard given by the students.

Explain

- Explain the different shapes and their properties with the help of Table 3.3 and 3.4 in the participant handbook.
- Explain the differences between 2D and 3D shapes (Table 3.5)

Summarize

- Summarize the session.
- Prepare a list of participants' doubts if they have any. Encourage them to ask questions.
- Answer their queries.

UNIT 3.4: Basic Components of an Engineering Drawing

Unit Objectives

After the completion of this unit, the participants will be able to:

1. Distinguish between types of lines and their interpretation in engineering drawings
2. Classify types of views
3. Differentiate between the types of angles of projection

Resources to be Used

- Participant handbooks
- Paper, Pens, Notepad, Chart paper
- Computer, Projector
- Whiteboard, Marker, and Duster

Notes for Facilitation

- Enter the class ten minutes before the session begins.
- Welcome and greet the students.
- Take the daily attendance.
- Maintain the record of assessment scores.

Do

- Begin the session with a brief recapitulation of the previous session.

Say

- "In the previous session, we gain an understanding of geometric dimensioning and tolerancing."
- "Today, we will learn about surface finish and its types."

Explain

- Explain the different types of lines (Table 3.6), views (Table 3.7) and angles of projection and their properties (Fig. 3.5).
- Explain the differences between First Angle Projection (Fig. 3.6) and Third Angle Projection (Fig. 3.7) with the help of Table 3.8 in the participant handbook.

Demonstrate

- Demonstrate an engineering drawing to the participants and explain the following elements:
  - Lines used in the drawing
  - Angle of projection used

Summarize

- Summarize the session.
- Prepare a list of participants' doubts if they have any. Encourage them to ask questions.
- Answer their queries.

UNIT 3.5: Geometric Dimensioning & Tolerancing (GD&T)

Unit Objectives

After the completion of this unit, the participants will be able to:

1. Define GD & T
2. Identify the symbols for GD & T
3. Discuss the benefits of GD&T
4. Define & interpret Datum and Notation
5. Elaborate feature control frame

Resources to be Used

- Participant handbooks
- Paper, Pens, Notepad, Chart paper
- Computer, Projector
- Whiteboard, Marker, and Duster

Notes for Facilitation

- Enter the class ten minutes before the session begins.
- Welcome and greet the students.
- Take the daily attendance.
- Maintain the record of assessment scores.

Do

- Begin the session with a brief recapitulation of the previous session.

Say

- "In the previous session, we gain an understanding of geometric dimensioning and tolerancing."
- "Today, we will learn about surface finish and its types."

Explain

- Explain the concept of GD&T, its features and benefits
- Explain the symbols for GD&T with the help of Table 3.9 and 3.10 in the participant handbook.

Activity

Objective	The purpose of this activity is to identify the tolerance symbols
Material required	Whiteboard
Procedure	Draw a few symbols and ask the participant to name them.
Conclusion	This activity explains the significance of tolerance symbols.

Explain

- Explain the concept of Datum and Notation (Fig. 3.8).
- Explain the interpretation of different features. (Table 3.11 and Table 3.12).

Elaborate

- Elaborate the feature Control Frame and its components (Fig. 3.9)

Do

- Enquire the participants to practice feature control frame interpretation.

Summarize

- Summarize the session with a brief of ways to build effective relationships.
- Prepare a list of participants' doubts if they have any. Encourage them to ask questions.
- Answer their queries.

UNIT 3.6: Surface Finish

Unit Objectives

After the completion of this unit, the participants will be able to:

1. Define surface finish and its types
2. Identify and interpret Surface roughness symbols

Resources to be Used

- Participant handbooks
- Paper, Pens, Notepad, Chart paper
- Computer, Projector
- Whiteboard, Marker, and Duster

Notes for Facilitation

- Enter the class ten minutes before the session begins.
- Welcome and greet the students.
- Take the daily attendance.
- Maintain the record of assessment scores.

Do

- Begin the session with a brief recapitulation of the previous session.

Say

- "In the previous session, we gain an understanding of geometric dimensioning and tolerancing."
- "Today, we will learn about surface finish and its types."

Explain

- Explain the concept of surface finish and its types with the help of Table 3.13 in the participant handbook.
- Explain the surface roughness symbols with the help of Table 3.14 in the participant handbook.

Summarize

- Summarize the session.
- Prepare a list of participants' doubts if they have any. Encourage them to ask questions.
- Answer their queries.

Exercise

- Instruct the class to open their Participant Handbook and complete the exercise given in unit 3.6.
- Ensure that the participants have opened the correct page for the exercise.
- Give the class 20 minutes to complete the exercise.
- Exercise Hints:

  Answer the following questions:

  1. 2D shapes – Rectangle, square, octagon, rhombus, parallelogram, circle, hexagon

     3D shapes – Cube, cone, cylinder, dice, pyramid, diamond, prism

  1. Reference given in 3.4.3, 3.4.2, 3.4.4

Scan the QR Code to watch the related video

www.youtube.com/watch?v=M8fAF0xMxBs
Engineering Drawing and its Purpose

www.youtube.com/watch?v=k3kFC9uTdUk
What is GD&T? and GD&T symbols

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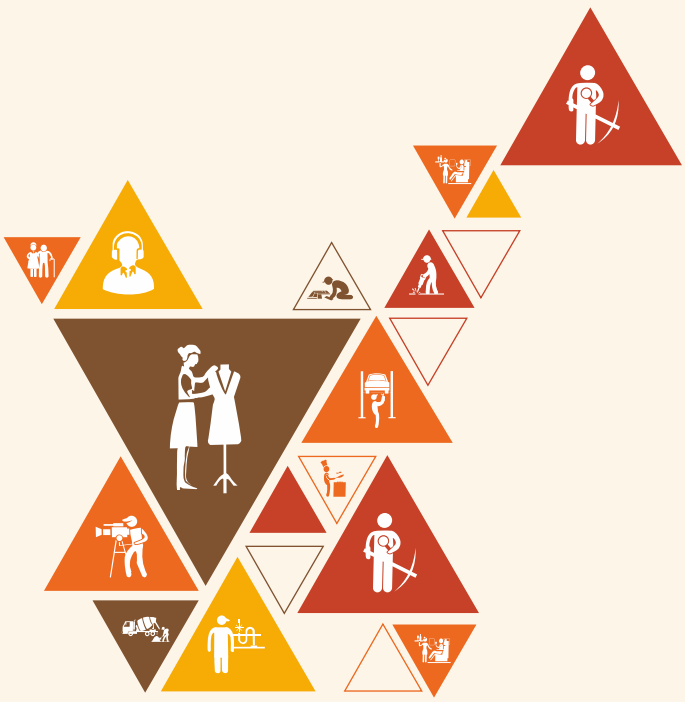
4. Prepare for Assembling Activities

Unit 4.1 - Identify work requirements

Unit 4.2 - Perform pre-assembly activities



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Key Learning Outcomes

At the end of the module, the trainees will be able to:

1. Identify tools and equipment required for assembly activity
2. Perform pre-assembling activities such as lifting of work piece, inspection of tools and equipment etc

Unit 4.1 Identify Work Requirements

Unit Objectives

At the end of this unit, the trainee will be able to:

1. Discuss the impact of various assembly operations on the vehicle and its components
2. List various components and systems of a vehicle
3. Discuss the information derived from the work order, assembly drawings, work instructions, SOPs, etc
4. List tools, measuring instruments, equipment, auto components/ parts and sub-assemblies required during assembling work
5. Explain various assembling operations such as bolting, tightening, riveting, fastening, adhesive clamping, crimping etc.

Resources to be Used

- Participant Handbook
- Paper, Pens, Notepad, Chart paper
- Computer, Projector
- Whiteboard, Marker, and Duster

Notes for Facilitation

- Enter the class ten minutes before the session begins.
- Welcome and greet the students.
- Take the daily attendance.
- Maintain the record of assessment scores

Do

- Begin the session with a brief recapitulation of the previous session.

Say

- "In the last module, we have covered engineering drawing and its purpose, dimensions, basic components of an engineering drawing, Geometric Dimensioning & Tolerancing (GD&T) and surface finish
- "Now, we will try to understand the impact of assembly operations on the vehicle."
- "Let's start this session by understanding the significance of assembly operations on the vehicle."
- "Automotive assembly refers to fitting the auto-manufactured parts together to produce a complete vehicle. Assembly line operations are the most common method for mass-production in the automotive sector."

Explain

- Explain the meaning of assembly operations and its impact on the vehicle and its components with the help of Fig.4.2 given in the Participant Handbook.
- Explain the vehicle system and its components with the help of Fig 4.3 given in the Participant Handbook.
- Explain the concept of work order, wiring, assembly drawings and SOPs with the help of Fig.4.4 given in the Participant Handbook.
- Explain various tools and instruments for assembling activities with the help of Fig.4.5 given in the Participant Handbook.

Activity

Objective	The purpose of this activity is to understand the various tools and instruments used in assembling activities.
Material required	Laptop/computer
Steps /procedure	• This is a skill practice activity. • Show the image of different tools and equipment through a presentation. • Ask the participants to recognize them. • Participants can take help from the Participant handbook (Fig 4.5). • Give 1-2 minutes to think of the answer. • Participants should share their answers before the class.
Conclusion / what has been achieved	This activity will help them to learn about various tools and instruments used in assembling activities.

Ask

- What is the use of micrometer and compasses?
- What do you understand by an automotive assembly?
- What is the function of the engine and battery in a vehicle?
- What is the difference between a wiring diagram and an assembly diagram?

Notes for Facilitation

- Allow one or two students to answer the questions.
- Write down the correct answer on the whiteboard.

Elaborate

- Elaborate on the following methods for assembly operations (Fig. 4.8):
  - Bolting and fastening and its procedure
  - Riveting and its procedure
  - Adhesive clamping and its procedure
  - Crimping and its procedure

Ask

- What is the function of the engine?
- What is the difference between riveting and crimping?
- What is the purpose of the steel tape and pneumatic tool?
- What is the crimping process?

Notes for Facilitation

- Allow one or two students to answer the questions.
- Write down the correct answer on the whiteboard.

Summarize

- Summarize the session.
- Prepare a list of participant's doubts if they have any. Encourage them to ask questions.
- Answer their queries.

Field Visit

- Arrange a visit to any of the automotive manufacturing facilities and show how assembly staff performs various assembly operations.

Exercise

- Instruct the trainees to open their Participant Handbook and complete the exercise given in unit 4.1.
- Ensure that the participants have opened the correct page for the activity.
- Give them 20 minutes to complete the exercise.
- Exercise Hints:
  - Answers to Questions I.
    1. Hint - Refer to section 4.1.4
    2. Hint - Refer to section 4.1.5
    3. Hint- Refer to section 4.1.5
    4. Hint - Refer to section 4.1.4
    5. Hint - Refer to section 4.1.5
  - Answers to Questions II.
    1. Systems
    2. Wiring diagram
    3. Engineering drawings
    4. Fuel system
    5. Adhesive Clamping

- Answers to Questions III.
  1. Exhaust system - transports the burnt exhaust fumes
  2. SOPs - step-by-step instructions
  3. Riveting - permanent joining process
  4. Nut runner - tightening nuts and screws
  5. Frame and body - vehicle's foundation

Unit 4.2 Perform Pre-Assembly Activities

Unit Objectives

At the end of this unit, the trainee will be able to:

1. Describe how to fill CLRI sheet
2. List the steps for setting up the equipment required for assembling work
3. Describe importance of selecting right program in case of robotic assembly method as per the work instructions
4. Discuss the process of lifting and placing the auto component on the designated place
5. Recall various types of defects such as paint, dents, grooves, cracks etc. and their impact on the auto components body
6. List the steps to be performed for checking the semi-precision mechanical, pneumatic, hydraulic and electrical parts in the auto components as per the work instructions.
7. List the steps to be performed for checking the adhesion of roof-lining, insulation material, roof-rail etc. of the auto component
8. Illustrate the process flow of assembly operations

Resources to be Used

- Participant Handbook
- Paper, Pens, Notepad, Chart paper
- Computer, Projector
- Whiteboard, Marker, and Duster

Notes for Facilitation

- Enter the class ten minutes before the session begins.
- Welcome and greet the students.
- Take the daily attendance.
- Maintain the record of assessment scores

Do

- Begin the session with a brief recapitulation of the previous session.

Say

- "In the last session, we discussed the impact of various assembly operations on the vehicle and its components, various components and systems of a vehicle, the information derived from the work order, assembly drawings, work instructions, SOPs, etc."
- "Today, we will cover how to perform pre-assembly activities."
- "Let's start today's session, with the CLRI sheet".
- "CLRI stands for Clean, Lubricate, Re-tighten, and Inspect. These are minor or basic tasks that technicians and operators perform on the vehicle."
- "Let us study in detail."

Explain

- Explain the CLRI sheet and its terms.
- Explain basic information required for filling a CLRI sheet with the help of Fig. 4.9 and Table 4.1 given in the Participating Handbook.
- Explain the instructions required to set up the equipment for assembly operations with the help of Fig. 4.10 given in the Participant Handbook.
- Explain the Conveyor system and its types with the help of Fig. 4.12 given in the Participant Handbook.
- Explain the standard procedure for lifting and placing auto components for assembly activity with the help of Fig. 4.14 given in the Participant Handbook.

Activity

Objective	The purpose of this activity is to understand how to fill the CLRI sheet.
Material required	Pen and paper
Steps /procedure	• This is a skill practice activity. • Ask the participants to use the sample template to fill the CLRI sheet which is available in the Participant Handbook (Table 4.1). • Ask the participants to fill CLRI and respective fields present in the template. • Give 5-10 minutes to complete the activity. • Ask the participants to show their answers to the class.
Conclusion / what has been achieved	This activity will help them to learn how to fill the CLRI sheet.

Ask

- What does CLRI stands for?
- What is the information required for filling the CLRI sheet?
- What are the first two steps of equipment set-up for assembly work?
- List the types of conveyor systems.

Elaborate

- Elaborate on the following topics:
  - Concept of robotic programming and robotic assembly
  - Stages in robotics assembly method (Fig 4.15)
  - Classification of industrial robots
  - Different types of programs for robotic assembly operation (Fig. 4.16)
  - Different types of the defect and their impact on auto components (Table. 4.2)

Demonstrate

- Demonstrate how robots make a car with the help of the YouTube link: https://www.youtube.com/watch?v=g3RxpoQ-KO4

Ask

- What do you understand by the robotic assembly and robotic programming?
- List all the stages of the robotics assembly method.
- What is the purpose of the manipulation robotic system?
- Give four examples of form defects in auto components.

Notes for Facilitation

- Allow one or two students to answer the questions.
- Write down the correct answer on the whiteboard.

Explain

- Explain the methods of transmitting power from one point to another in a vehicle.
- Explain the methods to check various auto parts with the help of Fig. 4.17 given in the Participant Handbook.
- Explain the steps for checking the adhesion of roof-lining, insulation material, and roof-rail of the auto component with the help of Table.4.3 given in the Participant Handbook.
- Explain the process flow of assembly operations with the help of Fig. 4.18 given in the Participant Handbook.
- Explain the significance of material availability and types of checks to determine material availability for order processing.
- Explain the concept of inventory, inventory control and inventory management.
- Explain the important inventory control techniques.

Ask

- What do you understand about the trim shop?
- What is the purpose of the roof lining?
- Can anyone name the three methods used for transmitting power from one point to another in a vehicle?
- What do you understand by Planned Inventory Transactions (PIT)?
- What is the difference between economic order quantity and just-in-time inventory control techniques?

Notes for Facilitation

- Allow one or two students to answer the questions.
- Write down the correct answer on the whiteboard.

Elaborate

- Elaborate the following topics:
  - Background of ERP and its software available for the manufacturing industry (Fig 4.24)
  - Stages of an ERP implementation (Fig.4.26)
  - Benefits of ERP system (Fig.4.27)
  - Production targets for productivity and tips for setting it (Fig 4.28)
  - Common factors affecting productivity (Fig 4.29)
  - OEE and its components

Ask

- Can you name the components of OEE?
- What is the purpose of the ABC analysis inventory control technique?
- What are the first two stages of ERP implementation?
- List five ERP software used in the manufacturing industry.
- Give two important tips for setting up the production targets.
- How to calculate an OEE for a single machine?

Notes for Facilitation

- Allow one or two students to answer the questions.
- Write down the correct answer on the whiteboard.

Summarize

- Summarize the session.
- Prepare a list of participant's doubts if they have any. Encourage them to ask questions.
- Answer their queries.

Exercise

- Instruct the trainees to open their Participant Handbook and complete the exercise given in unit 4.2.
- Ensure that the participants have opened the correct page for the activity.
- Give them 20 minutes to complete the exercise.
- Exercise Hints:
  - Answers to Questions I.
    1. Hint - Refer to section 4.2.1
    2. Hint -Refer to section 4.2.5
    3. Hint- Refer to section 4.2.7
    4. Hint – Refer to section 4.2.3
    5. Hint – Refer to section 4.2.8
    6. Hint- Refer to section
       - (a) Refer to section 4.2.3
       - (b) Refer to section 4.2.10
       - (c) Refer to section 4.2.11
       - (d) Refer to section 4.2.9
  - Answers to Questions II.
    1. Clean, Lubricate, Re-tighten, and Inspect
    2. All of the above
    3. 24/7
    4. Right sequence
  - Answers to Questions III.
    1. ERP software
    2. OEE=(AxPxQ)
    3. Undergoes via drying process
    4. Wrinkles
    5. Skill gap

Scan the QR Code to watch the related video

www.youtube.com/watch?v=tIhHml428No

All about rivet and installing of it

www.youtube.com/watch?v=MPcZLqR7A1k

Various types of defects such as paint, dents, grooves, cracks etc.

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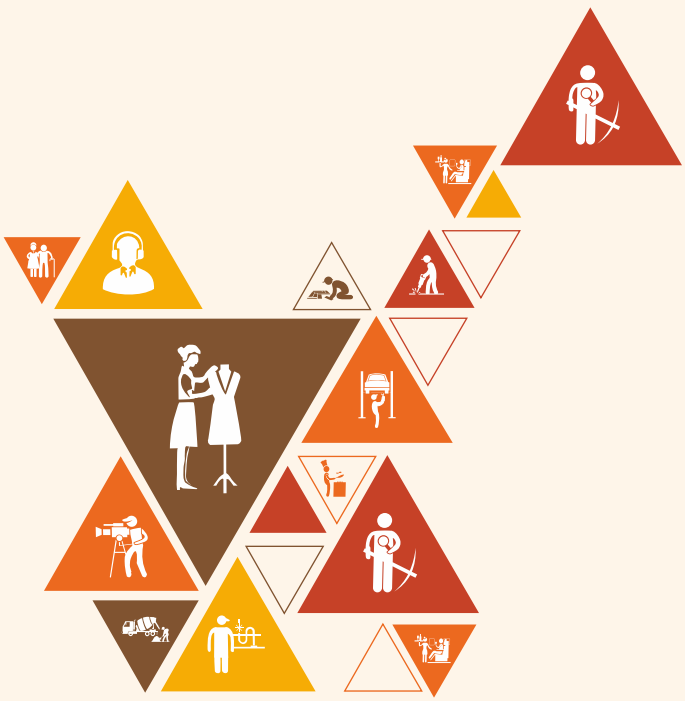
5.Perform Vehicle Components' Assembly and Post -Assembly Operations

Unit - 5.1 Perform Assembly Operations

Unit - 5.2 Perform Post-Assembly Operations



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Key Learning Outcomes

At the end of the module, the trainees will be able to:

1. Perform assembly of components of vehicle
2. Perform post-assembly operations

Unit 5.1 Perform Assembly Operations

Unit Objectives

At the end of this unit, the trainee will be able to:

1. Outline the process of various mechanical components' assembly operations such as bolting, riveting, tightening etc. and electrical components' assembly operations such as wire connections, wire color identification, wire routing, wire stripping, crimping, soldering, high frequency welding etc
2. List various sealing compounds and their applications in a vehicle assembly
3. List the steps to be performed for labelling the auto components
4. Discuss the information needed to be mentioned on the labels of the auto components

Resources to be Used

- Participant Handbook
- Paper, Pens, Notepad, Chart paper
- Computer, Projector
- Whiteboard, Marker, and Duster

Notes for Facilitation

- Enter the class ten minutes before the session begins.
- Welcome and greet the students.
- Take the daily attendance.
- Maintain the record of assessment scores

Do

- Begin the session with a brief recapitulation of the previous session.

Say

- In the last unit, we have covered the process of filling out the CLRI sheet, steps for setting up the equipment required for assembling work, the process of lifting and placing the auto component, various types of defects, ERP, OEE and its components etc."
- "In this session, we discuss various mechanical and electrical components assembly operations and sealing compounds."
- "Also, we will learn the process of application of sealing compounds on a vehicle assembly, steps to be performed for labelling the auto components and the information needed to be mentioned on the labels of the auto components."

Explain

- Explain the parts and circuits of the auto components-electrical with the help of Fig.5.1 given in the Participant Handbook.
- Explain the importance of circuit protection and fuses and the classification of circuit protection.
- Explain various types of assembly operations for auto manufacturing with the help of the Table.5.1 given in the Participant Handbook.
- Explain the reaction plans for abnormal operational efficiencies during assembly operation.

Elaborate

- Elaborate the following topics:
  - Concept of adhesives and sealant and their uses in various applications (Fig 5.2)
  - Basic types of adhesives and sealants used in the automotive industry (Fig.5.3)
  - Significance of labeling auto components and various materials used for labeling
  - Information required for auto component labeling (Fig.5.4)
  - Steps for auto component labeling (Fig.5.5)

Ask

- What are the uses of adhesive and coolant in the automotive industry?
- List all the elements in which labeling material must be resistant.
- Give two names of the labeling material.
- What are the steps for Auto Component Labeling?

Notes for Facilitation

- Allow one or two students to answer the questions.
- Write down the correct answer on the whiteboard.

Summarize

- Summarize the session.
- Prepare a list of participant's doubts if they have any. Encourage them to ask questions.
- Answer their queries.

Exercise

- Instruct the trainees to open their Participant Handbook and complete the exercise given in unit 5.1.
- Ensure that the participants have opened the correct page for the activity.
- Give them 20 minutes to complete the exercise.
- Exercise Hints:
  - Answers to Questions I.
    1. Hint - Refer to section 5.1.1.2
    2. Hint - Refer to section 5.1.1
    3. Hint - Refer to section 5.1.2
    4. Hint - Refer to section
       a. Refer to section 5.1.2
       b. Refer to section 5.1.3
       c. Refer to section 5.1.4
  - Answers to Questions II.
    1. Polyester
    2. Epoxy and Anaerobic
    3. Battery
  - Answers to Questions III.
    1. Adhesives and sealants
    2. Soldering

- Answers to Questions IV.
  1. True
  2. True
  3. False
  4. True

Unit 5.2 Perform Post-Assembly Operations

Unit Objectives

At the end of this unit, the trainee will be able to:

1. Recall the tasks to be performed post-assembly
2. Discuss the importance of selecting the correct lubricant
3. Explain the properties and specifications of lubricant required for lubricating the required component
4. Summarize the commonly occurring defects in the assembled vehicle
5. Discuss the impact of defects on the quality of assembled vehicle
6. Explain the inspection and testing methods for identifying the defects and checking the quality of assembled vehicle as per the control plan
7. Identify different methods for disposing off waste material such as waste oil, scrap, etc.
8. Discuss the necessary precautions to avoid any hazard and accident during assembly and post-assembly activities

Resources to be Used

- Participant Handbook
- Paper, Pens, Notepad, Chart paper
- Computer, Projector
- Whiteboard, Marker, and Duster

Notes for Facilitation

- Enter the class ten minutes before the session begins.
- Welcome and greet the students.
- Take the daily attendance.
- Maintain the record of assessment scores

Do

- Begin the session with a brief recapitulation of the previous session.

Say

- "In the last unit, we have covered various mechanical and electrical components assembly operations and sealing compounds, the process of application of sealing compounds on a vehicle assembly, steps to be performed for labelling the auto components and the information needed to be mentioned on the labels of the auto components."
- "Now, we will try to understand the other post-assembly activities."
- "Let's start this session by understanding the purpose of post-assembly activities."
- "After assembly operation, the vehicle components go through various post-assembly activities to reach its final stage."

Explain

- Explain the post-assembly activities in vehicle manufacturing with the help of Fig.5.6 given in the Participant Handbook.
- Explain the significance of lubricant and its basic functions (Fig 5.7).
- Explain the concept of thickener in lubricant.
- Explain the common terminology for selecting lubricant with the help of Fig.5.8 given in the Participant Handbook.
- Explain the specific equipment used in lubricating application.
- Explain the significance of replacing and monitoring the operating temperature of lubricants.

Elaborate

- Elaborate the following topics:
  - Common defects and their impact on the assembled vehicle (Fig 5.9)
  - Various inspection tools and vehicle testing methods (Fig 5.10)
  - Significance of waste disposal and waste disposal methods (Fig.5.12)
  - Safe disposal rules (Fig.5.13)
  - Concept of safety hazards and precautions
  - Potential hazards and risks occurred during assembly operations (Fig 5.14)
  - Safety measures to be followed by all the auto manufacturing staff and workers (Fig 5.15)

Demonstrate

- Demonstrate the various inspection carried out after manufacturing a vehicle with the help of YouTube link: https://www.youtube.com/watch?v=6gJLaou9NkU

Ask

- What is the purpose of wheel alignment tester?
- What is the difference between air bags and seatbelts?
- Can you name the three safe disposal rules?
- Which method is used most commonly for waste disposal?
- Can you name any two properties of lubricants?
- What is the purpose of "The Factories Act of 1948"?
- Which new act replaces "The Factories Act of 1948"?
- List any five potential hazards and risks that occurred during assembly operations.

Notes for Facilitation

- Allow one or two students to answer the questions.
- Write down the correct answer on the whiteboard.

Summarize

- Summarize the session.
- Prepare a list of participant's doubts if they have any. Encourage them to ask questions.
- Answer their queries.

Exercise

- Instruct the trainees to open their Participant Handbook and complete the exercise given in unit 5.2.
- Ensure that the participants have opened the correct page for the activity.
- Give them 20 minutes to complete the exercise.
- Exercise Hints:
    - Answers to Questions I.
        1. Hint - Refer to section 5.2.3
        2. Hint - Refer to section 5.2.2
        3. Hint- Refer to section 5.2.2
        4. Hint - Refer to section 5.2.4

- Answers to Questions II.
  1. Defect
  2. Machine lubricants, coolants
  3. The Factories Act of 1948
  4. Landfill
- Answers to Questions III.
  1. Kinematic viscosity
  2. Lubrication
  3. Standard precautions and safety measures
- Answers to Questions IV.
  1. True
  2. False
  3. False
  4. False

Scan the QR Code to watch the related video

www.youtube.com/watch?v=t6RL7SkfAQU

Lubricant types and properties

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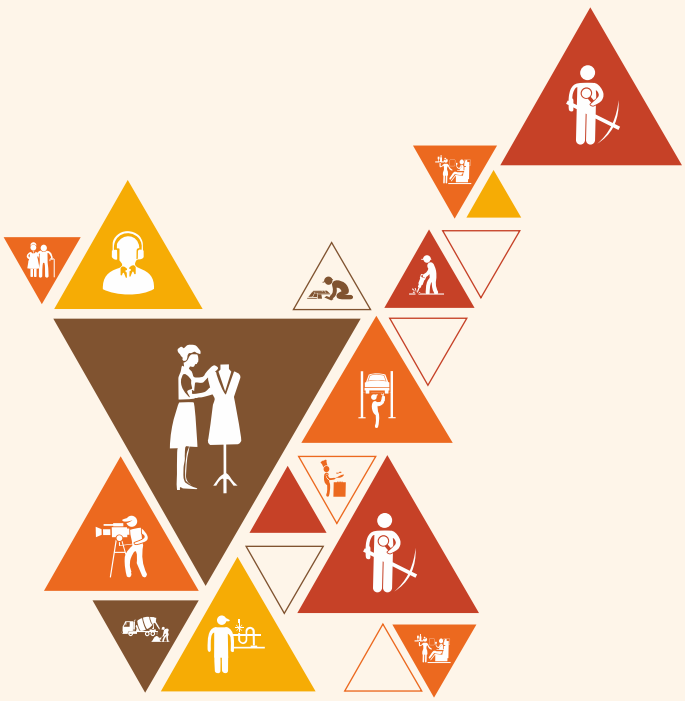
6. Employability and Entreprenuership Skills

https://eskillindia.org/NewEmployability



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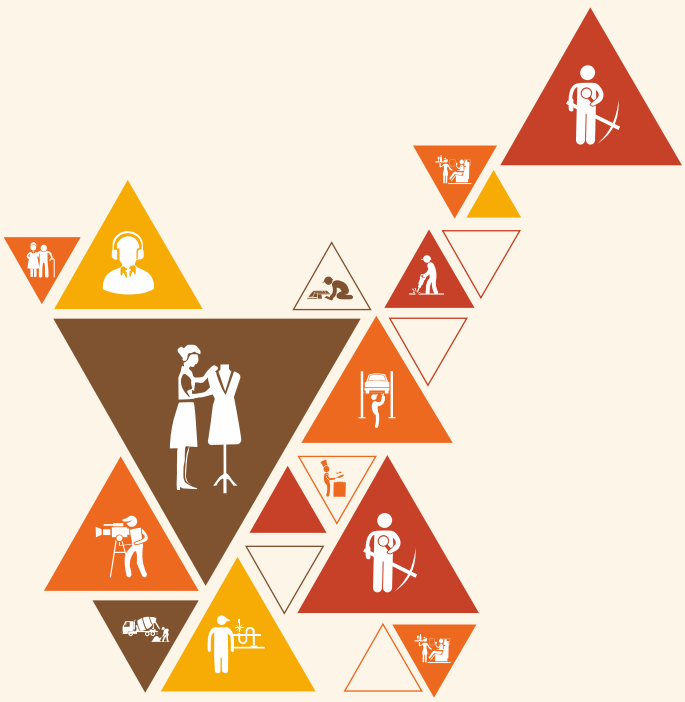
7. Annexures

Annexure I : QR Code

Annexure II : Training Delivery Plan

Annexure III : Assessment Criteria



Annexure - QR Code

Serial No.	Module No.	Unit Number	Topic Name	Page No.	URL	QR Code
1	1. Introduction to the role of an Automotive Assembly Operator	Unit 1.1 - Introduction to the Automotive Assembly Operator	Introduction to Automotive Industry	9	www.youtube.com/watch?v=PJP7xVBLBL8	
2	Organize Work and Resources in Manufacturing	Unit 2.3 - Health and Hygiene Practices for at Workplace	Health and Hygiene Practices for at Workplace	24	www.youtube.com/watch?v=ANiJU50JgbM	
		Unit 2.5 - Waste Management in Manufacturing	Waste management and its disposal		www.youtube.com/watch?v=42UHIRVwxec	
3	Interpret Engineering Drawing	Unit 3.1 - Engineering Drawing and its Purpose	Engineering Drawing and its Purpose	39	www.youtube.com/watch?v=M8fAF0xMxBs	
		Unit 3.5 - Geometric Dimensioning & Tolerancing (GD&T)	What is GD&T? and GD&T symbols		www.youtube.com/watch?v=k3kFC9uTdUk	

Annexure - QR Code

Serial No.	Module No.	Unit Number	Topic Name	Page No.	URL	QR Code
4	Prepare for Assembling Activities	Unit 4.1 - Identify work requirements	All about rivet and installing of it	53	www.youtube.com/watch?v=tIhHml428No	
		Unit 5.2 - Perform pre-assembling activities	Various types of defects such as paint, dents, grooves, cracks etc.		www.youtube.com/watch?v=MPcZLqR7A1k	
5	Perform vehicle component's assembly and post-assembly operations	Unit 6.2 - Perform post-assembly operations	Lubricant types and properties	63	www.youtube.com/watch?v=t6RL7SkfAQU	
6	Employability and Entreprenuership Skills		Employability and Entreprenuership Skills	64	https://eskillindia.org/NewEmployability	
			Effective communication		www.youtube.com/watch?v=I6IAhXM-vps	

Annexure - QR Code

Serial No.	Module No.	Unit Number	Topic Name	Page No.	URL	QR Code
			Gender sensitivity in workplace		www.youtube.com/watch?v=SsqGxFx9-QE	

Annexure II
Training Delivery Plan

Training Delivery Plan			
Program Name	**Automotive Assembly Technician**		
Qualification Pack, Name and Reference ID	Automotive Assembly Technician ASC/Q3601, v5.0		
Version No.	5.0	**Version Update Date**	17/11/2022
Pre-requisites to Training (If any)	NA		
Minimum Educational Qualification and Experience	10th Class + 1 year ITI OR 10th Class pass with 2 years of relevant experience OR 11th Class Pass OR Certificate-NSQF (Automotive Assembly Operator) with 2 Years of experience		
Training Outcome	**After completing this programme, trainee will be able to:** 1. Interpret engineering drawings for identification of raw material, tools and equipment required for the assembly operations. 2. Perform pre-assembling activities such as lifting of work piece, inspection of tools and equipment etc. 3. Perform various assembling operations such as bolting, tightening, riveting, fastening, adhesive clamping, crimping etc. 4. Perform post-assembly operations such as cleaning and testing of vehicle. 5. Work effectively and efficiently as per schedules and timelines. 6. Implement safety practices. 7. Optimize the use of resources to ensure less wastage and maximum conservation. 8. Communicate effectively using interpersonal skills.		

Sl. No.	Module Name	Session Name	Session Objectives	NOS Ref.	Methodology	Training Tools/Aids	Duration in Hours
1.	Introduction to Role of an Automotive Assembly Technician	Introduction to the Automotive Assembly Technician	1. Describe the role and responsibilities of an Automotive Assembly Technician 2. List the job opportunities for an Automotive Assembly Technician	N/A Bridge Module	Group Activity	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 2 P: 0
		Overview of the Automotive Industry and its Market	1. Explain about Indian automotive manufacturing market 2. List the various automobile Original Equipment manufacturers (OEMS) and different products/model manufactured by them 3. Discuss the standard and procedures involved in the different processes of assembly 4. Identify the standard checklists and schedules recommended by OEM	N/A	Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 3 P: 0
2.	Organize work and resources (Manufacturing)	Maintaining a Safe and Secure Working Environment	1. Distinguish occupational hazards associated with CNC machining	ASC/N9803	Lecture in the class	Participant Handbook, Projector, Whiteboard, Marker, and Duster	T:4 P:4

Sl. No.	Module Name	Session Name	Session Objectives	NOS Ref.	Methodology	Training Tools/Aids	Duration in Hours
		Maintaining a Safe and Secure Working Environment (Contd..)	2. Determine the factors aggravating occupational hazards		Lecture in the class	Participant Handbook, Projector, Whiteboard, Marker, and Duster	T:4 P:4
		Essential Preventive Measures While operating CNC Machine	1. Apply the rules for keeping safe while operating on CNC machine 2. List the Do's before setting up of the machine		Lecture in the class (Activity, Discussions with examples)	Participant Handbook, Projector, Whiteboard, Marker, and Duster	T:4 P:4
		Health and Hygiene Practices at workplace	1. Discuss the health and hygiene practices at workplace		Lecture in the class (Activity, Discussions with examples)	Participant Handbook, Projector, Whiteboard, Marker, and Duster	T:2 P:6
		Quality Management Systems	1. Define quality management system 2. Elaborate automotive quality management system and its compliance principles		Lecture in the class (Activity, Discussions with examples)	Participant Handbook, Projector, Whiteboard, Marker, and Duster	T:2 P:5
		Waste Management in Manufacturing	1. Identify wastes in industrial environment		Lecture in the class (Activity, Discussions with examples)	Participant Handbook, Projector, Whiteboard, Marker, and Duster	T:2 P:6
		Energy Conservation Practices in Manufacturing	1. Describe the energy conservation practices at workplace		Lecture in the class (Activity, Discussions with examples)	Participant Handbook, Projector, Whiteboard, Marker, and Duster	T:2 P:6

Sl. No.	Module Name	Session Name	Session Objectives	NOS Ref.	Methodology	Training Tools/Aids	Duration in Hours
3.	Interpret the Engineering Drawing	Engineering Drawing and its Purpose	1. Define engineering drawing and outline its usage	ASC/N9805	Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T:1.5 P:1.5
		Measurement	1. Define measurement and its units		Interactive Lecture in the Class, Activity	Participant handbook, Projector, Whiteboard, Marker, and Duster	T:1.5 P:1.5
		Dimensions	1. Compare between 1D, 2D, and 3D shapes 2. Interpret the angles and axis		Interactive Lecture in the Class, Activity	Participant handbook, Projector, Whiteboard, Marker, and Duster	T:3 P:3
		Basic Components of Engineering Drawing	1. Distinguish between types of lines and their interpretation in engineering drawings 2. Classify types of views 3. Differentiate between the types of angles of project		Interactive Lecture in the Class, Group Activity	Participant handbook, Projector, Whiteboard, Marker, and Duster	T:3 P:3
		Geometric Dimensioning& Tolerancing (GD&T)	1. Define GD &T 2. Identify the symbols for GD&T 3. Discuss the benefits of GD&T 4. Define& interpret Datum and Notation 5. Elaborate feature control frame		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T:3 P:3

Sl. No.	Module Name	Session Name	Session Objectives	NOS Ref.	Methodology	Training Tools/Aids	Duration in Hours
		Surface Finish	1. Define surface and its types 2. Identify and interpret surface roughness symbols		Interactive Lecture in the Class, Activity	Participant handbook, Projector, Whiteboard, Marker, and Duster	T:3 P:3
4.	Prepare for Assembling Activities	Identify Work Requirements	1. Discuss the impact of various assembly operations on the vehicle	ASC/N3611	Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 3 P: 5
		Identify Work Requirements –(Contd.)	2. List various components and systems of a vehicle		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 3 P: 5
		Identify Work Requirements –(Contd.)	3. Discuss the information derived from the work order, assembly drawings, work instructions, SOPs,etc		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 3 P: 5
		Identify Work Requirements –(Contd.)	4. List tools, measuring instruments and accessories required during assembling work		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 3 P: 5
		Identify Work Requirements –(Contd.)	5. Explain various assembling operations such as bolting, tightening, riveting, fastening, adhesive clamping, crimping etc		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 3 P: 5
		Identify Work Requirements –(Contd.)					T: 0 P: 5

Sl. No.	Module Name	Session Name	Session Objectives	NOS Ref.	Methodology	Training Tools/Aids	Duration in Hours
		Perform steps for pre-assembly activities	1. Describe how to fill CLRI sheet		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 2 P: 2
		Perform steps for pre-assembly activities (Contd.)	2. List the steps for setting up the equipment required for assembling work		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 2 P: 4
		Perform steps for pre-assembly activities (Contd.)	3. Describe importance of selecting right program in case of robotic assembly method as per the work instructions		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 2 P: 4
		Perform steps for pre-assembly activities (Contd.)	4. Discuss the process of lifting and placing the auto component on the designated place		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 2 P: 4
		Perform steps for pre-assembly activities (Contd.)	5. Recall various types of defects such as paint, dents, grooves, cracks etc. and their impact on the auto components body		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 2 P: 4
		Perform steps for pre-assembly activities (Contd.)	6. List the steps to be performed for checking the semi-precision mechanical, pneumatic, hydraulic and electrical parts in the auto components as per the work instructions		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 2 P: 4

Sl. No.	Module Name	Session Name	Session Objectives	NOS Ref.	Methodology	Training Tools/Aids	Duration in Hours
		Perform steps for pre-assembly activities (Contd.)	7. List the steps to be performed for checking the adhesion of roof-lining, insulation material, roof-rail etc. of the auto component		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 2 P: 4
		Perform steps for pre-assembly activities (Contd.)	8. Illustrate the process flow of assembly operations		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 1 P: 4
5.	Perform vehicle component's assembly and post-assembly operations	Support in Assembly Operations	1. Outline the process of various mechanical components' assembly operations such as bolting, riveting, tightening etc. and electrical components' assembly operations such as wire connections, wire color identification, wire routing, wire stripping, crimping, soldering, high frequency welding etc	ASC/N3611	Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 4 P: 4
		Support in Assembly Operations –(Contd.)					T: 1 P: 7
		Support in Assembly Operations –(Contd.)			Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 0 P: 8

Sl. No.	Module Name	Session Name	Session Objectives	NOS Ref.	Methodology	Training Tools/Aids	Duration in Hours
		Support in Assembly Operations –(Contd.)	2. List various sealing compounds and their applications in a vehicle assembly		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 4 P: 4
		Support in Assembly Operations –(Contd.)			Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 1 P: 7
		Support in Assembly Operations –(Contd.)	3. List the steps to be performed for labelling the auto components		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 4 P: 4
		Support in Assembly Operations –(Contd.)			Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 1 P: 7
		Support in Assembly Operations –(Contd.)			Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 0 P: 8
		Support in Assembly Operations –(Contd.)	4. Discuss the information needed to be mentioned on the labels of the auto components		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 4 P: 4

Sl. No.	Module Name	Session Name	Session Objectives	NOS Ref.	Methodology	Training Tools/Aids	Duration in Hours
		Support in Assembly Operations –(Contd.)			Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 1 P: 7
		Support in Post-Assembly Operations	1. Recall the tasks to be performed post-assembly		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 5 P: 3
		Support in Post-Assembly Operations –(Contd.)	2. Discuss the importance of selecting the correct lubricant		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 5 P: 3
		Support in Post-Assembly Operations –(Contd.)	3. Explain the properties and specifications of lubricant required for lubricating the required component		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 5 P: 3
		Support in Post-Assembly Operations –(Contd.)	4. Summarize the commonly occurring defects in the assembled vehicle		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 5 P: 3
		Support in Post-Assembly Operations –(Contd.)			Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 0 P: 4
		Support in Post-Assembly Operations –(Contd.)	5. Discuss the impact of defects on the quality of assembled vehicle		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 5 P: 3

Sl. No.	Module Name	Session Name	Session Objectives	NOS Ref.	Methodology	Training Tools/Aids	Duration in Hours
		Support in Post-Assembly Operations –(Contd.)			Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 0 P: 8
		Support in Post-Assembly Operations –(Contd.)	6. Explain the inspection and testing methods for identifying the defects and checking the quality of assembled vehicle as per the control plan		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 5 P: 3
		Support in Post-Assembly Operations –(Contd.)			Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 0 P: 8
		Support in Post-Assembly Operations –(Contd.)	7. Identify different methods for disposing off waste material such as waste oil, scrap, etc		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 5 P: 3
		Support in Post-Assembly Operations –(Contd.)			Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 0 P: 8
		Support in Post-Assembly Operations –(Contd.)	8. Discuss the necessary precautions to avoid any hazard and accident during assembly and post-assembly activities		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 5 P: 3
		Support in Post-Assembly Operations –(Contd.)			Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 0 P: 8

Sl. No.	Module Name	Session Name	Session Objectives	NOS Ref.	Methodology	Training Tools/Aids	Duration in Hours
6.	Employability Skills (60 hours)	Introduction to Employability Skills	1. Discuss the importance of Employability Skills in meeting the job requirements	DGT/VSQ/N0102	Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 0.5 P: 1.0
		Constitutional values - Citizenship	1. Explain constitutional values, civic rights, duties, citizenship, responsibility towards society etc. that are required to be followed to become a responsible citizen.		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 0.5 P: 1.0
		Becoming a Professional in the 21st Century	1. Discuss 21st century skills. 2. Describe the benefits of continuous learning		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 1.0 P: 1.5
		Basic English Skills	1. Describe basic communication skills		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 4 P: 4
		Basic English Skills (Contd..)	2. Discuss ways to read and interpret text written in basic English		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 0 P: 2
		Career Development & Goal Setting	1. Discuss need of career development plan		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 1 P: 1

Sl. No.	Module Name	Session Name	Session Objectives	NOS Ref.	Methodology	Training Tools/Aids	Duration in Hours
		Communication Skills	1. Explain the importance of active listening for effective communication 2. Discuss the significance of working collaboratively with others in a team		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 2 P: 3
		Diversity & Inclusion	1. Discuss the significance of reporting sexual harassment issues in time		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 1 P: 1.5
		Financial and Legal Literacy	1. List the common components of salary and compute income, expenditure, taxes, investments etc. 2. Discuss the legal rights, laws, and aids		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 2 P: 3
		Essential Digital Skills	1. Describe the role of digital technology in today's life		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 4 P: 2
		Essential Digital Skills (Contd...)	2. Discuss the significance of using internet for browsing, accessing social media platforms, safely and securely		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 0 P: 2

Sl. No.	Module Name	Session Name	Session Objectives	NOS Ref.	Methodology	Training Tools/Aids	Duration in Hours
		Entrepreneurship	1. Explain the types of entrepreneurship and enterprises 2. Discuss how to identify opportunities for potential business, sources of funding and associated financial and legal risks with its mitigation plan 3. Describe the 4Ps of Marketing- Product, Price, Place and Promotion and apply them as per requirement		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 3 P: 4
		Customer Service	1. Explain the significance of identifying customer needs and addressing them. 2. Explain the significance of identifying customer needs and responding to them in a professional manner 3. Discuss the significance of maintaining hygiene and dressing appropriately.		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 2 P: 3

Sl. No.	Module Name	Session Name	Session Objectives	NOS Ref.	Methodology	Training Tools/Aids	Duration in Hours
		Getting ready for apprentice ship & Jobs	1. Discuss the significance of maintaining hygiene and confidence during an interview 2. List the steps for searching and registering for apprenticeship opportunities		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 3 P: 5
				Total (In Hours)		**Theory**	154
						Practical	266
						On-the-Job Training	30
						***Grand Total (in Hours)**	450 hours

Annexure III

Assessment Criteria

CRITERIA FOR ASSESSMENT OF TRAINEES

Assessment Criteria for Automotive Assembly Technician	
Job Role	**Automotive Assembly Technician**
Qualification Pack	**ASC/Q3601, v.5**
Sector Skill Council	**Automotive**

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) (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 for the theory part will be based on knowledge bank of questions created by the SSC.
3.	Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training centre (as per assessment criteria below).
4.	Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/ training centre based on these criteria.
5.	In case of successfully passing only certain number of NOSs, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack.
6.	In case of unsuccessful completion, the trainee may seek reassessment on the Qualification Pack.

Total Marks: 400	Compulsory NOS				
Assessable Outcomes	**Assessment criteria for outcomes**	**Theory Marks**	**Practical Marks**	**Project Marks**	**Viva Marks**
1. ASC/N9803. **Organize work and resources (Service)**	**Maintain safe and secure working environment**	**11**	**5**	**-**	**7**
	Pc1. identify hazardous activities and the possible causes of risks or accidents in the workplace	2	1	-	2
	Pc2. follow safe working practices while dealing with hazards to ensure safety of self and others	2	-	-	1
	PC3. carry out routine check of the machine for identifying potential hazards	2	1	-	2
	PC4. use appropriate protective clothing/equipment for specific tasks and work	2	1	-	1
	PC5. follow safety hazards and preventive techniques during fire drill	2	1	-	1
	PC6. report any identified breaches in health, safety and security policies and procedures to the designated person	1	1	-	1
	Health and hygiene	**7**	**5**	**-**	**2**
	PC7. ensure workstation and equipment are regularly clean and sanitized	2	2	-	1
	PC8. clean hands with soap, alcohol-based sanitizer regularly	1	1	-	1
	PC9. avoid contact with ill people and self-isolate in a similar situation	1	1	-	-
	PC10. wear and dispose PPEs regularly and appropriately	1	-	-	-
	PC11. report advanced hygiene and sanitation issues to appropriate authority	1	1	-	-
	PC12. follow stress and anxiety management techniques	1	1	-	-
	Perform work as per quality standards	**5**	**3**	**-**	**2**

Total Marks: 400	Compulsory NOS				
Assessable Outcomes	**Assessment criteria for outcomes**	**Theory Marks**	**Practical Marks**	**Project Marks**	**Viva Marks**
	PC13. ensure that work is accomplished as per the requirements within the specified timeline	2	2	-	1
	PC14. ensure team goals are given preference over individual goals	3	1	-	1
	Effective waste management practices	**15**	**10**	**-**	**4**
	PC15. follow the fundamentals of 5S for waste management	3	2	-	1
	PC16. segregate waste into different categories	2	2	-	1
	PC17. follow processes specified for disposal of hazardous waste	4	2	-	1
	PC18. identify recyclable, non-recyclable and hazardous waste	4	2	-	1
	PC19. dispose non-recyclable, recyclable and reusable waste appropriately at identified location	4	3	-	1
	Material/energy conservation practices	**12**	**7**	**-**	**5**
	PC20. identify ways to optimize usage of material in various tasks/activities/processes	2	1	-	1
	PC21. check for spills/leakages in various tasks/ activities/ processes	2	1	-	1
	PC22. plug spills/leakages and escalate to appropriate authority if unable to rectify	2	1	-	-
	Pc23. check if the equipment/machine is functioning normally before commencing work and rectify wherever required	2	1	-	1
	Pc24. report malfunctioning (fumes/ sparks/ emission/ vibration/noise) and lapse in maintenance of equipment	2	1	-	1

Total Marks: 400	Compulsory NOS				
Assessable Outcomes	**Assessment criteria for outcomes**	**Theory Marks**	**Practical Marks**	**Project Marks**	**Viva Marks**
	PC25. ensure electrical equipment and appliances are properly connected and turned off when not in use	2	1	-	1
	NOS Total	**50**	**30**	**-**	**20**
2. ASC/Q9805: Interpret engineering drawing	**Interpret information from various views, projection, 2D and 3D shapes**	**21**	**11**	**-**	**10**
	Pc1. interpret engineering drawing's uniqueness, dimensions and important features in 2D and 3D shapes	5	3	-	2
	PC2. identify the difference between 2D and 3D shapes	4	2	-	2
	PC3. explain difference between first angle projection and third angle projection in mechanical engineering drawing	4	-	-	2
	PC4. interpret all the 3 axes (x, y and z axis) and geometrical shapes (cones, cylinder, sphere, cuboid, etc) on to a 2D and 3D projection	5	3	-	2
	PC5. identify details of the machine component which are not clearly visible by interpreting section views	3	3	-	2
	Identify drawing standards and symbols	**23**	**15**	**-**	**8**
	PC6. interpret Geometric Dimensioning and Tolerencing (GD&T) symbols in the drawings	6	4	-	2
	PC7. interpret symbols of Radius, controlled radius, spherical radius, diameter, spherical diameter, square, counterbore, spotface, depth, countersink, “by”, maximum dimension, minimum dimension, reference, dimension origin etc.	6	4	-	2
	PC8. identify the sequence of operations which enables the selection and prioritization of the datums	5	3	-	2

Total Marks: 400	Compulsory NOS				
Assessable Outcomes	**Assessment criteria for outcomes**	**Theory Marks**	**Practical Marks**	**Project Marks**	**Viva Marks**
	PC9. read and interpret information from Tolerance Zone boundaries for part features in terms of shape and size	6	4	-	2
	Modification and storage of drawing	**6**	**4**	**-**	**2**
	PC10. observe any modification, changes required in the drawing and communicate the same to the concerned team in the organization	3	2	-	1
	PC11. store the drawings in an easily accessible place, avoiding damage from moisture, chemicals and fire	3	2	-	1
	NOS Total	**50**	**30**	**-**	**20**
3. ASC/N3611: Perform vehicle assembly operations	**Identify the work requirements**	**8**	**6**	**-**	**5**
	PC1. identify the work to be done by interpreting the assembly drawing/work instructions/SOPs	1	2	-	1
	PC2. select the appropriate method of assembly on the basis of drawing information	4	-	-	2
	PC3. identify the tools, measuring instruments, equipment, auto components/parts and sub- assemblies required for the job	3	4	-	2
	Perform pre-assembly activities	**12**	**17**	**-**	**8**
	PC4. check and clean the assembling equipment of any dust and impurities	1	2	-	1
	PC5. fill CLRI (Clean, lubricate, retighten & inspection) check sheet and report to the supervisor about any abnormalities identified and action taken to resolve them	1	4	-	2
	PC6. setup the equipment required as per the selected assembling method	1	2	-	-

Total Marks: 400	Compulsory NOS				
Assessable Outcomes	**Assessment criteria for outcomes**	**Theory Marks**	**Practical Marks**	**Project Marks**	**Viva Marks**
	PC7. ensure that the right programme is selected in case of robotic assembly method as defined in the SOP	1	-	-	-
	PC8. lift the auto component manually or by hoist and place the same securely on the designated slot/space as indicated in the drawing/work instructions	2	2	-	-
	PC9. inspect and mark the defects if any, such as in paint, dents, grooves, cracks, rough edges etc. on the physical body of the auto component	2	2	-	2
	PC10. check all the semi-precision mechanical, pneumatic, hydraulic and electrical parts in the auto components by using the correct methodology as indicated in the Work Instructions/SOPs	3	3	-	2
	PC11. check adhesion of roof-lining, insulation material, roof-rail etc. of the auto component	1	2	-	1
	Conduct the assembly operation	**7**	**17**	**-**	**4**
	PC12. perform assembly operation and assemble the safety parts i.e. bearings, shafts etc., electrical semi-precision parts such as electric wire harness, Electronic Control Unit (ECU), automatic lock system, fuel injection system and other similar parts	3	7	-	1
	PC13. perform installation of the Oil and Lube systems by placing and fitting the funnel, filters, hose pipes, glands, sockets, suction guns and regulator valves as prescribed in the Work Instructions/ SOPs/Control Plans	2	5	-	1
	PC14. carry out sealing of the required areas to prevent any leakage of water/air etc. during the usage of the component	1	3	-	1

Total Marks: 400	Compulsory NOS				
Assessable Outcomes	**Assessment criteria for outcomes**	**Theory Marks**	**Practical Marks**	**Project Marks**	**Viva Marks**
	PC15. carry out labeling on the auto components specifying the information related to assembly process and quality norms followed	1	2	-	1
	Conduct the post-assembly operations	**3**	**10**	**-**	**3**
	PC16. apply appropriate lubricant on the component as per manufacturer's specifications	1	2	-	1
	PC17. check and confirm that water, diesel or petrol, brake oil, gear oil, engine oil etc. are filled as per the required volume and type	1	3	-	1
	PC18. check the assembled auto components as per the control plan, work instructions for product quality	-	3	-	-
	PC19. dispose scrap or waste material into the disposal area in accordance with the company's policies and environmental regulations	1	2	-	1
	NOS Total	**30**	**50**	**-**	**20**
4. DGT/VSQ/N0101: Employability Skills (30 Hours)	**Introduction to Employability Skills**	**1**	**1**	**-**	**-**
	PC1. understand the significance of employability skills in meeting the job requirements	-	-	-	-
	Constitutional values – Citizenship	**1**	**1**	**-**	**-**
	PC2. identify constitutional values, civic rights, duties, personal values and ethics and environmentally sustainable practices	-	-	-	-
	Becoming a Professional in the 21st Century	**1**	**3**	**-**	**-**
	PC3. explain 21st Century Skills such as Self-Awareness, Behavior Skills, Positive attitude, self-motivation, problem-solving, creative thinking, time management, social and cultural awareness, emotional awareness, continuous learning mindset etc.	-	-	-	-

Total Marks: 400	Compulsory NOS				
Assessable Outcomes	**Assessment criteria for outcomes**	**Theory Marks**	**Practical Marks**	**Project Marks**	**Viva Marks**
	Basic English Skills	**2**	**3**	**-**	**-**
	PC4. speak with others using some basic English phrases or sentences	-	-	-	-
	Communication Skills	**1**	**1**	**-**	**-**
	PC5. follow good manners while communicating with others	-	-	-	-
	PC6. work with others in a team	-	-	-	-
	Diversity & Inclusion	**1**	**1**	**-**	**-**
	PC7. communicate and behave appropriately with all genders and PwD	-	-	-	-
	PC8. report any issues related to sexual harassment	-	-	-	-
	Financial and Legal Literacy	**3**	**4**	**-**	**-**
	PC9. use various financial products and services safely and securely	-	-	-	-
	PC10. calculate income, expenses, savings etc.	-	-	-	-
	PC11. approach the concerned authorities for any exploitation as per legal rights and laws	-	-	-	-
	Essential Digital Skills	**4**	**6**	**-**	**-**
	PC12. operate digital devices and use its features and applications securely and safely	-	-	-	-
	PC13. use internet and social media platforms securely and safely	-	-	-	-
	Entrepreneurship	**3**	**5**	**-**	**-**
	PC14. identify and assess opportunities for potential business	-	-	-	-
	PC15. identify sources for arranging money and associated financial and legal challenges	-	-	-	-

Total Marks: 400	Compulsory NOS				
Assessable Outcomes	**Assessment criteria for outcomes**	**Theory Marks**	**Practical Marks**	**Project Marks**	**Viva Marks**
	Customer Service	**2**	**2**	**-**	**-**
	PC16. identify different types of customers	-	-	-	-
	PC17. identify customer needs and address them appropriately	-	-	-	-
	PC18. follow appropriate hygiene and grooming standards	-	-	-	-
	Getting ready for apprenticeship & Jobs	**1**	**3**	**-**	**-**
	PC19. create a basic biodata	-	-	-	-
	PC20. search for suitable jobs and apply	-	-	-	-
	PC21. identify and register apprenticeship opportunities as per requirement	-	-	-	-
	NOS Total	**20**	**30**	**-**	**-**

Glossary

- **Sector:** Sector is a conglomeration of different business operations having similar business and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.
- **Sub-sector:** Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
- **Occupation:** Occupation is a set of job roles, which perform similar/ related set of functions in an industry. Job role: Job role defines a unique set of functions that together form a unique employment opportunity in an organisation.
- **Occupational Standards (OS):** OS specify the standards of performance an individual must achieve when carrying out a function in the workplace, together with the Knowledge and Understanding (KU) they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
- **Performance Criteria (PC):** Performance Criteria (PC) are statements that together specify the standard of performance required when carrying out a task.
- **National Occupational Standards (NOS):** NOS are occupational standards which apply uniquely in the Indian context.
- **Qualifications Pack (QP):** QP comprises the set of OS, together with the educational, training and other criteria required to perform a job role. A QP is assigned a unique qualifications pack code.
- **Unit Code:** Unit code is a unique identifier for an Occupational Standard, which is denoted by an 'N'
- **Unit Title:** Unit title gives a clear overall statement about what the incumbent should be able to do.
- **Description:** Description gives a short summary of the unit content. This would be helpful to anyone searching on a database to verify that this is the appropriate OS they are looking for.
- **Scope:** Scope is a set of statements specifying the range of variables that an individual may have to deal with in carrying out the function which have a critical impact on quality of performance required.
- **Knowledge and Understanding (KU):** Knowledge and Understanding (KU) are statements which together specify the technical, generic, professional and organisational specific knowledge that an individual needs in order to perform to the required standard.

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Address: 153, GF, Okhla Industrial Area, Phase - III, Leela Building, New Delhi 110020
Email: www.asdc.org.in
Web: info@asdc.org.in
Phone: 011 42599800