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Transforming the skill landscape



Facilitator Guide



Sector
Automotive

Sub-Sector
Manufacturing

Occupation
Assembly Operation

Reference ID: ASC/Q3604, Version-3.0
NSQF Level: 3

Automotive Assembly Operator



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Developed by:

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Shri Narendra Modi
Prime Minister of India

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

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 Operator" in the Automotive Sector.

This course is aligned to Qualification Pack, Automotive Assembly Operator, Reference ID: ASC/Q3604

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/N9802: Interact effectively with colleagues, customers and others
3. ASC/N9805: Interpret engineering drawing
4. ASC/N3617: Support the technician in 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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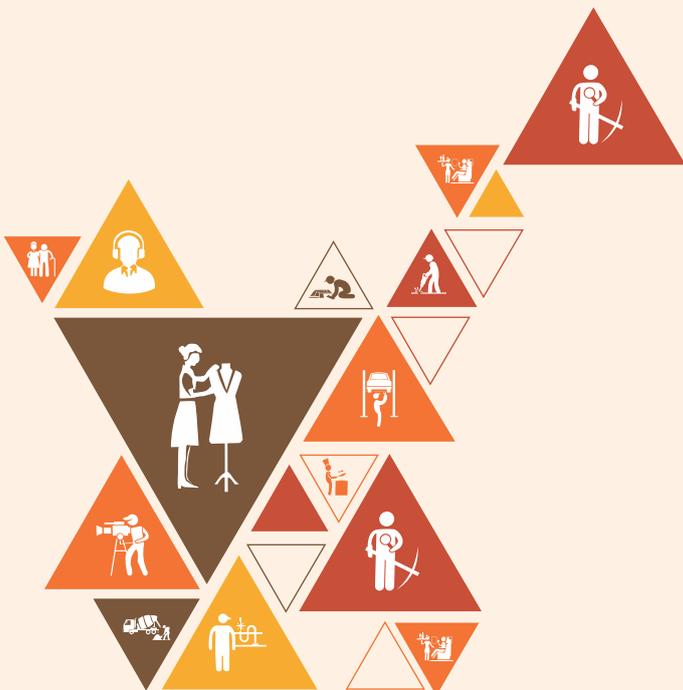
Transforming the skill landscape



1. Introduction to Role of an Automotive Assembly Operator

Unit 1.1 - Introduction to the Automotive Assembly Operator

Unit 1.2 - Overview of the Automotive Industry and its Market



Key Learning Outcomes

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

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

Unit1.1 Introduction to the Automotive Assembly Operator

Unit Objectives

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

1. List the role and responsibilities of an Automotive Assembly Operator
2. Discuss the job opportunities of an Automotive Assembly Operator

Resources to be Used

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

Do

- Welcome and greet the students.

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 an "Automotive Assembly Operator", 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 Operator".
- Say, "Before we start the program let's play a small game".

Activity

Objective	The purpose of this activity is to build rapport with the coursemates
Material required	Parcel (for passing)

contd..

Procedure	<ul style="list-style-type: none"> • 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 favorite 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 / what has been achieved	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. Now, we will discuss skills, roles and responsibilities of an assembly operator."

Explain



- Explain the skills required to be an automotive assembly operator with the help of Fig. 1.1 given in the Participant Handbook.
- Explain the roles and responsibilities of an automotive assembly operator with the help of Fig.1.3 given in the Participant Handbook.
- Explain the benefits of working as an automotive assembly operator with the help of Fig.1.4 given in the Participant Handbook.

Ask



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

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 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 1.1.1.
- 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. Automotive assembly operator
 2. Automotive assembly operator
 3. Manufacturing

Unit 1.2 Overview of the Automotive Industry and its Market

Unit Objectives

After the completion of this unit, the participants 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 handbooks
- Paper, Pens, Notepad, Chart paper
- Computer, Projector, Flipchart
- Whiteboard, Marker, and Duster

Say

- “In the last unit, we gained an understanding of skills, roles and responsibilities of an automotive assembly operator.”
- “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 1.2.1 given in the Participant Handbook.
- Explain the Indian automotive manufacturing market of two-wheeler vehicles with the help of Fig. 1. 2.5 given in the Participant Handbook.
- Explain the key segments of automotive vehicles with the help of Fig.1. 2.6 given in the Participant Handbook.
- Explain India’s pre-owned vehicle market with the help of Fig.1. 2.7 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 on the following topics:
 - Original equipment manufacturer (OEM) in the automotive industry and its key features (Fig 1.8)
 - OEM versus after markets (Fig.1.2.9)
 - Top OEMs in the automobile industry (Table1. 2.2)
 - Standards and procedures in the different assembly processes
 - Process -flow of various assembly operations in automotive industry (Fig 1. 2.10)
 - Key feature and procedure of production scheduling (Fig 1. 2.11 and 1. 2.12)
 - Various production checklists in automotive manufacturing (Fig 1. 2.13)

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 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 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

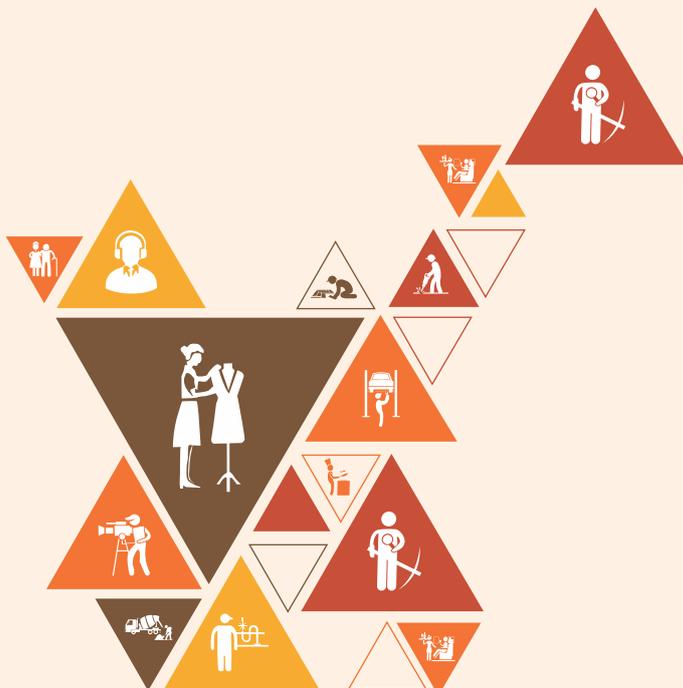
Unit 2.2 - Essential Preventive Measures for CNC Machine Operators

Unit 2.3 - Health and Hygiene Practices for CNC Machine Operators

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 handbooks
- 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

- Revise the learnings of the previous sessions and ask them if they have any doubts.

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 on 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 the machine

Resources to be Used

- Participant handbooks
- 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 on 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 handbooks
- 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. Explain automotive quality management system and their compliance principles

Resources to be Used

- Participant handbooks
- 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 on the following topics:
 - IATF 16949
 - IATF 16949 seven quality management principles and compliance principles with the help of (Fig.2.4.4)

Ask



- What does IATF 16949 stand 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 handbooks
- 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 handbooks
- 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 identification of waste in an industrial environment.”
- “In today’s session, we’ll talk about the 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 unit 2.2.
- 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

Scan the QR Code to watch the related video



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

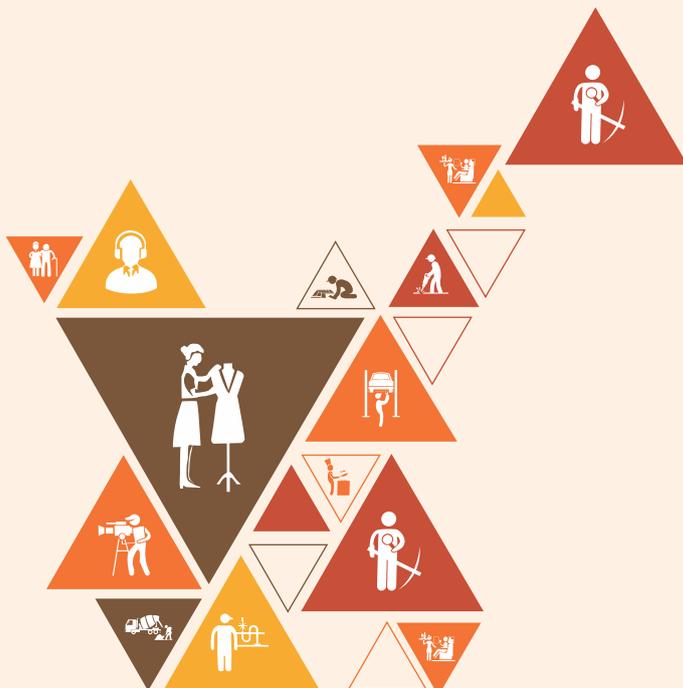
Unit 3.2 - Measurement

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

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 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. 3.1 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	<ul style="list-style-type: none"> • 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 / what has been achieved	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	<ul style="list-style-type: none"> • Ask questions on shapes and angles. For example: <ul style="list-style-type: none"> ◦ 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 / what has been achieved	This activity enables to understand the different units and the formulae to convert from one unit to another.

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 / what has been achieved	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 / what has been achieved	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.
- 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 3.6.6.
- 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

Key Learning Outcomes



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

1. Identify tools and equipment required for assembly operations
2. Perform the steps to carry out pre-assembly activities such as lifting of vehicle components, inspection of tools and equipment, inspection of vehicle components for defects etc

UNIT 4.1 Identify Tools and Equipment for Assembly Activities

Unit Objectives

After the completion of this unit, the participants 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 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 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 means fitting the auto-manufactured parts together to produce a complete vehicle. Assembly line operations are the most common methods of mass production in the automotive industry.”

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 Table. 4.1 given in the Participant Handbook.
- Explain the concept of work order, wiring, assembly drawings and SOPs with the help of Fig.4.3 given in the Participant Handbook.
- Explain various tools and instruments for assembling activities with the help of Fig.4.4 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
Procedure	<ul style="list-style-type: none"> • 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 4.4). • 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 micrometers 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 board.

Elaborate

- Elaborate on the following methods for assembly operations:
 - Bolting and fastening and its procedure
 - Riveting and its procedure
 - Adhesive clamping and its procedure
 - Crimping and its procedure
 - Alignment and adjustment and its procedure (Fig 4.9 and 4.10)
 - Various tools used for alignment and adjustment operation in vehicle assembly

Ask

- What is the function of the engine?
- What is the difference between riveting and crimping?
- Can you name the three main types of alignment?
- What is the purpose of the steel tape?
- Can you name any two functions of the wiring diagram and assembly drawings?

Notes for Facilitation

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

Demonstrate

- Demonstrate the procedure and steps to perform a wheel alignment with the help of youtube link: https://www.youtube.com/watch?v=w_FXVQ14lis

Ask

- What is the difference between hydraulic tools and hand tools?
- What is the purpose of the pneumatic tool?
- Can you name the three main suspension angles for alignment and adjustment in the vehicle?
- 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 facility and show how to perform 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 4.1.3
 3. Hint- Refer to section 4.1.5
 4. Hint - Refer to section 4.1.5
 5. Hint - Refer to section 4.1.5
 - Answers to Questions II.
 1. Systems
 2. Wiring diagram
 3. Assembly drawings
 4. Fuel system
 5. Thrust alignment

- Answers to Questions III.
 1. Exhaust system - transports the burnt exhaust fumes
 2. Caster - forward or reverse angle of the steering
 3. SOPs - step-by-step instructions
 4. Riveting - permanent joining process
 5. Nut runner - tightening nuts and screws
 6. Pneumatic tools - compressed air
 7. Frame and body - vehicle's foundation

UNIT 4.2 Perform Pre-Assembly Activities

Unit Objectives

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

1. Discuss the process of filling CLRI sheet and reporting to the supervisor about the abnormalities identified in it
2. Discuss the organizational process of collecting and arranging tools, measuring instruments, equipment, auto components/ parts and sub- assemblies from the store
3. Summarize the steps to be performed for checking the tools and equipment before use
4. Discuss the process of lifting and placing the auto component on the designated place as per the work instructions
5. Describe the process flow of assembly operations
6. Recall various types of defects such as paint, dents, grooves, cracks etc. and their impact on the vehicle assembly
7. Discuss the necessary precautions to avoid any hazard and accident during assembly activities

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 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 CLRI sheet and its terms.
- Explain basic information required for filling a CLRI sheet with the help of Fig. 4.14 and Table 4.2 given in the Participating Handbook.
- Explain the significance of reporting faulty tools and equipment to the concerned authority with the help of Fig. 4.15 given in the Participant Handbook.
- Explain the procedure to report the faulty equipment, tools and materials with the help of Fig. 4.16 given in the Participant Handbook.

Activity

Objective	The purpose of this activity is to understand how to fill CLRI sheet.
Material required	Pen and paper
Procedure	<ul style="list-style-type: none"> • 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 4.2). • 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 CLRI sheet.

Ask

- What does CLRI stands for?
- What is the information required for filling the CLRI sheet?
- What is the significance of reporting faulty tools and equipment to the concerned authority?

Notes for Facilitation

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

Explain

- Explain the importance of collecting appropriate tools and materials from the store (Fig 4.17)
- Explain the procedure for storing and arranging tools, equipment and auto components (Fig. 4.18)
- Explain the procedure for collecting tools and equipment (Fig. 4.19)
- Explain the instructions required to set up the equipment for assembly operations (Fig. 4.20)
- Explain the steps to check tools and equipment before using them (Fig. 4.21)

Elaborate

- Elaborate on the following topics:
 - Conveyor system in automotive assembly and its various configurations
 - Standard procedure for lifting and placing auto components (Fig 4.23)
 - Different types of defects and its impact on automotive components (Table 4.3)

Activity



Objective	The purpose of this activity is to revise the session.
Material required	Pen and paper
Procedure	<ul style="list-style-type: none"> • This is a skill practice activity. • Divide the whole class into 3 groups. • Each group will be given three different topics, on which they have to provide a broad explanation. • The first group will be writing on the procedure to store and collect the tools and equipment used for assembly operations. • The second group will be writing on the procedure to check the tools and equipment. • And the third group will be writing on the procedure to lift and place the tools and equipment. • The group, which can present their answers in the best way, within 20 minutes, will be awarded appreciation and accolades.
Conclusion / what has been achieved	This activity will assist participants to gain knowledge of the procedure to store, collect, check, lift and place the tools and equipment for the assembly operations.

Ask



- Can anyone name the first three steps of a procedure for storing and arranging tools and equipment?
- What is the procedure for collecting tools and equipment?
- Give three examples of surface and form defects.
- What do you understand about the conveyor system?
- List five configurations of the conveyor system.
- Can you name three types of defects in auto components?

Notes for Facilitation



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

Elaborate



- Elaborate on the following topics:
 - Process flow of assembly operations (Fig 4.24)
 - Steps to be performed after going through the process flow stages
 - Concept of safety hazards and precautions
 - Potential hazards and risks occurred during assembly operations (Fig 4.25)
 - Safety measures to be followed by all the auto manufacturing staff and workers (Fig 5.26)

Ask



- What is the purpose of a paint shop?
- 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 board.

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 4.2.6

3. Hint- Refer to section 4.2.7
4. Hint – Refer to section 4.2.5
5. Hint – Refer to section
 - (a) Refer to section 4.2.5
 - (b) Refer to section 4.2.4
 - (c) Refer to section 4.2.2
- Answers to Questions II.
 1. True
 2. False
 3. True
 4. False
- Answers to Questions III.
 1. Engine, lights, horns, balancing of tyres, and the charging system
 2. Right sequence
 3. Proper storage
 4. Factories Act 1948
- Answers to Questions IV.
 1. Various installation of different parts and components
 2. Colour Bleed
 3. Lift bulky or heavy auto components

Scan the QR Code to watch the related video



www.youtube.com/watch?v=NI3gc8Z5gOw
CLRI sheet



www.youtube.com/watch?v=T30WGLCrevo
Process of assembly operations



youtu.be/9nvptpU4y3I



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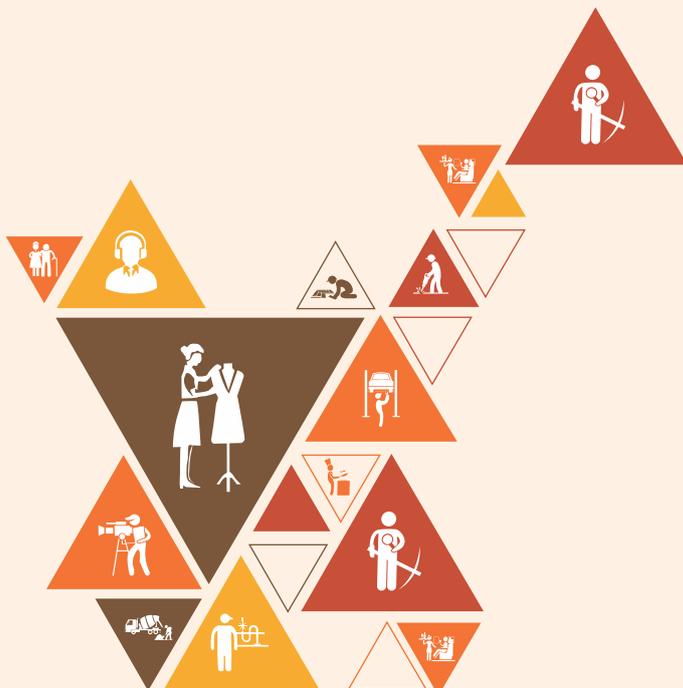
Transforming the skill landscape



5. Support in assembly and post-assembly activities

Unit5.1 - Support in assembly operations

Unit5.2 - Support in post-assembly operations



ASC/N3617

Key Learning Outcomes



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

1. Demonstrate various assembly operations such as bolting, tightening, riveting, fastening, adhesive clamping, crimping etc.
2. Identify requirements for post-assembly activities
3. Show how to carry out post-assembly activities

Unit 5.1 Support in Assembly Operations

Unit Objectives

After the completion of this unit, the participants 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
3. Discuss the process of application of sealing compounds on a vehicle assembly
4. List the steps to be performed for labelling the auto components

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 last unit, we have covered the process of filling out the CLRI sheet and reporting to the supervisor about the abnormalities identified in it, the organizational process of collecting and arranging tools, measuring instruments, equipment, auto components/parts, and sub-assemblies from the store, 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.5.3 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 concept and template of the control plan with the help of Table.5.2 given in the Participant Handbook.

Activity

Objective	The purpose of this activity is to understand how to fill the control plan.
Material required	Pen and paper
Procedure	<ul style="list-style-type: none"> • This is a skill practice activity. • Ask the participants to use the sample template to fill the control plan which is available in the Participant Handbook (Table 5.2). • Ask the participants to fill control plan 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 control plan.

Ask 

- What is the control plan?
- What is the difference between riveting and crimping?
- What is the use of fuses?

Notes for Facilitation 

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

Elaborate 

- Elaborate on the following topics:
 - Concept of adhesives and sealant and their uses in various applications (Fig 5.5)
 - Basic types of adhesives and sealants used in the automotive industry (Fig.5.6)
 - Significance of labeling auto components and various materials used for labeling
 - Information required for auto component labeling (Fig.5.7)
 - Steps for auto component labeling (Fig.5.8)
 - Background of ISO 9000 and IATF 16949

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?
- What is IATF 16949?

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 5.1.2
 - a) Hint - Refer to section 5.1.2
 - b) Hint - Refer to section 5.1.2
 - c) Hint - Refer to section 5.1.3
 2. Hint - Refer to section 5.1.2
 3. Hint - Refer to section 5.1.1
 4. Hint – Refer to section 5.1.2
 - Answers to Questions II.
 1. Polyester and vinyl
 2. Epoxy and anaerobic
 3. adhesives and sealants
 4. Soldering
 5. Battery
 6. Weight reduction and miniaturization
 - Answers to Questions III.
 - True
 - False
 - False
 - True

Unit 5.2 Support in Post-Assembly Operations

Unit Objectives

After the completion of this unit, the participants 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. Recall the organizational recommended procedure for storage of tools, equipment and fixture after completion of work
8. List the different methods for disposing off waste material and scrap

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.

Resources to be Used

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

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.5.9 given in the Participant Handbook.
- Explain the significance of lubricant and its basic functions (Fig 5.10).
- Explain the concept of thickener in lubricant.
- Explain the common properties of lubricants with the help of Fig.5.11 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 on the following topics:
 - Common defects and their impact on the assembled vehicle (Fig 5.12)
 - Various inspection tools and methods (Fig 5.13 and 5.14)
 - Procedure to handle and store the tools and equipment after work (Fig5.15)
 - Significance of waste disposal and waste disposal methods (Fig.5.17)
 - Safe disposal rules (Fig.5.18)

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?

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 5.2.2
 2. Hint - Refer to section 5.2.4
 3. Hint- Refer to section 5.2.2
 4. Hint - Refer to section 5.2.3
 5. Hint - Refer to section 5.2.5
 - Answers to Questions II.
 1. Defect
 2. Machine lubricants, coolants, solvent cleaning systems, paint, scrap metals, and plastics
 3. The Factories Act of 1948
 4. standard precautions and safety measures
 5. Landfill
 6. Kinematic viscosity
 7. Lubrication
 8. Storage

- Answers to Questions II.

1. True

2. False

3. False

4. False

5. True

6. False



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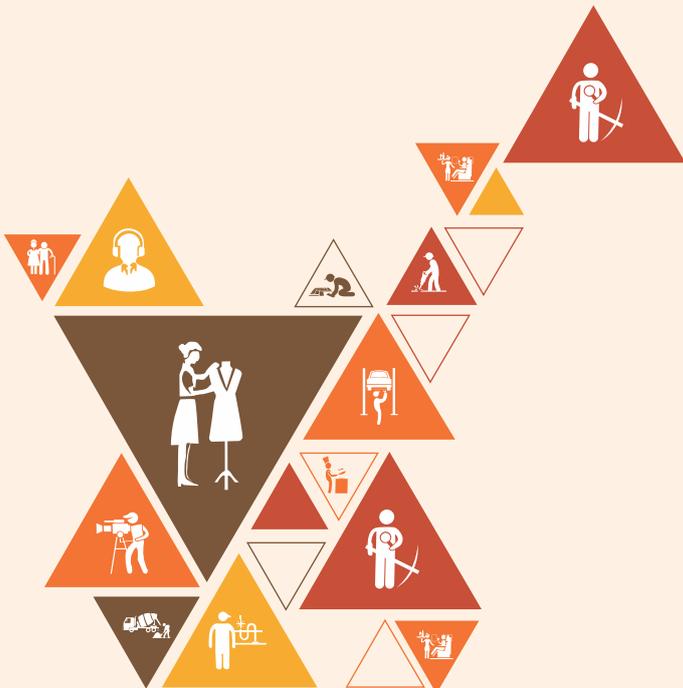
Transforming the skill landscape



6. Employability and Entrepreneurship Skills



<https://eskillindia.org/NewEmployability>





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Corporation

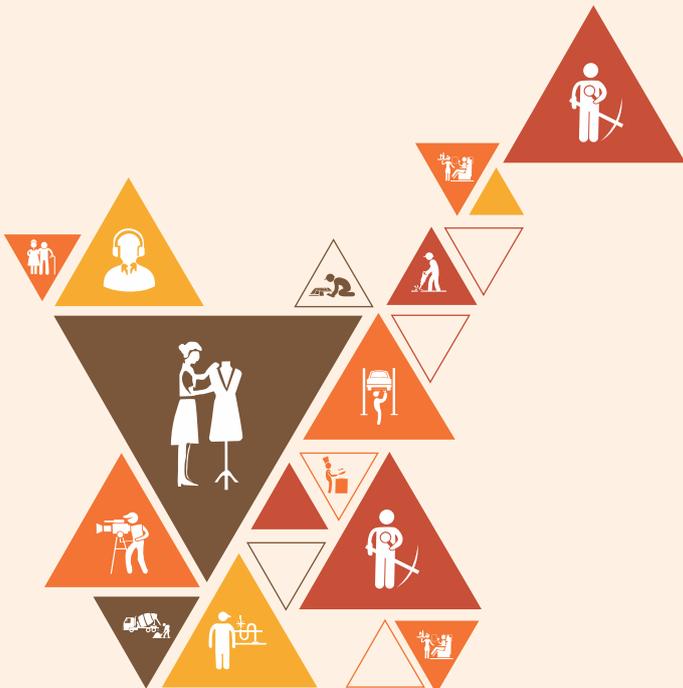
Transforming the skill landscape



7. Annexures

Annexure I : Training Delivery Plan

Annexure II : 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	8	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	23	www.youtube.com/watch?v=ANiJU5OJgbM	
		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 tools and equipment for assembly activities	CLRI sheet	52	www.youtube.com/watch?v=NI3gc8Z5gOw	
		Unit 4.2 - Perform steps for pre-assembly activities	Process of assembly operations		www.youtube.com/watch?v=T30WGLCRevo	
			Inspection and Testing Methods		youtu.be/9nvptpU4y3I	
5.	Employability and Entrepreneurship Skills		Employability and Entrepreneurship Skills	63	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 I

Training Delivery Plan

Training Delivery Plan			
Program Name	Automotive Assembly Operator		
Qualification Pack, Name and Reference ID	Automotive Assembly Operator ASC/Q3604, v4.0		
Version No.	4.0	Version Update Date	17-11-2022
Pre-requisites to Training (If any)	NA		
Minimum Educational Qualification and Experience	5th Class pass with 4 years of relevant experience OR 8th Class Pass with 1 year of relevant experience OR 9th Class pass OR Certificate-NSQF Level 2 (Automotive Assembly Assistant) with 2 Years of relevant experience		
Training Outcome	<p>After completing this programme, participants will be able to:</p> <ol style="list-style-type: none"> 1. Interpret engineering drawings for identification of raw material, tools and equipment required for the assembly operations. 2. Support assembly technician in pre-assembling activities such as lifting of work piece, inspection of tools and equipment etc. 3. Support assembly technician in various assembling operations such as bolting, tightening, riveting, fastening, adhesive clamping, crimping etc. 4. Support assembly technician in 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. 		

Sl No.	Module Name	Session Name	Session Objectives	NOS Ref.	Methodology	Training Tools/Aids Duration	Duration (hh:mm)
1.	Introduction to Role of an Automotive Assembly Operator	Introduction to the Automotive Assembly Operator	1. List the role and responsibilities of an Automotive Assembly Operator 2. Discuss the job opportunities of an Automotive Assembly Operator	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 in Manufacturing	Maintaining a Safe and Secure Working Environment	1.Distinguish occupational hazards associated with CNC machining	ASC/N98 03	Lecture in the class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 4 P: 4
		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

Sl No.	Module Name	Session Name	Session Objectives	NOS Ref.	Methodology	Training Tools/Aids Duration	Duration (hh:mm)
		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
3.	Interpret the Engineering Drawing	Engineering Drawing and its Purpose	1. Define engineering drawing and outline its usage with CNC machining	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	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 1.5 P: 1.5

Sl No.	Module Name	Session Name	Session Objectives	NOS Ref.	Methodology	Training Tools/Aids Duration	Duration (hh:mm)
		Dimensions	1.Compare between 1D, 2D, and 3D shapes 2.Interpret the angles and axis		Interactive Lecture in the Class	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
		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 Processes	Identify tools and equipment for assembly activities	1.Discuss the impact of various assembly operations on the vehicle	ASC/N36 17	Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 3 P: 5
		Identify tools and equipment for assembly activities –(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

Sl No.	Module Name	Session Name	Session Objectives	NOS Ref.	Methodology	Training Tools/Aids Duration	Duration (hh:mm)
		Identify tools and equipment for assembly activities –(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 tools and equipment for assembly activities –(Contd.)	4.List tools, measuring instruments and accessories required during assembling workof angles of project		Interactive Lecture in the Class, Group Activity	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 3 P: 5
		Identify tools and equipment for assembly activities –(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 tools and equipment for assembly activities –(Contd.)		T: 0 P: 5			
		Perform steps for pre-assembly activities	1.Discuss the process of filling CLRI sheet and reporting to the supervisor about the abnormalities identified in it		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 3 P: 5
		Perform steps for pre-assembly activities (Contd.)	2.Discuss the organisational process of collecting and arranging tools measuring instruments equipment, auto components/parts and sub-assemblies from the store		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 3 P: 5

Sl No.	Module Name	Session Name	Session Objectives	NOS Ref.	Methodology	Training Tools/Aids Duration	Duration (hh:mm)
		Perform steps for pre-assembly activities (Contd.)	3.Summarize the steps to be performed for checking the tools and equipment before use		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 3 P: 5
		Perform steps for pre-assembly activities (Contd.)	4.Discuss the process of lifting and placing the auto component on the designated place as per the work instructions		Interactive Lecture in the Class, Group Activity	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 3 P: 5
		Perform steps for pre-assembly activities (Contd.)	5.Describe the process flow of assembly operations components body		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 3 P: 5
		Perform steps for pre-assembly activities (Contd.)	6.Recall various types of defects such as paint, dents, grooves, cracks etc. and their impact on the vehicle assembly		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 1 P: 5
		Perform steps for pre-assembly activities (Contd.)	7.Illustrate the process flow of assembly operations		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 1 P: 5

Sl No.	Module Name	Session Name	Session Objectives	NOS Ref.	Methodology	Training Tools/Aids Duration	Duration (hh:mm)		
5.	Support in assembly and post-assembly activities Processes	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/N36 17	Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 3 P: 5		
		Support in Assembly Operations –(Contd.)					T: 3 P: 5		
		Support in Assembly Operations –(Contd.)	2.List various sealing compounds				Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 3 P: 5
		Support in Assembly Operations –(Contd.)	3.Discuss the process of application of sealing compounds on a vehicle assembly				Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 1.5 P: 2.5
		Support in Assembly Operations –(Contd.)	4.List the steps to be performed for labelling the auto components				Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 1.5 P: 2.5
		Support in Assembly Operations –(Contd.)	5.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: 3 P: 5

Sl No.	Module Name	Session Name	Session Objectives	NOS Ref.	Methodology	Training Tools/Aids Duration	Duration (hh:mm)
		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: 3 P: 5
		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: 3 P: 5
		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: 3 P: 5
		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: 3 P: 5
		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: 3 P: 5
		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: 3 P: 5
		Support in Post-Assembly Operations –(Contd.)	7. Recall the organizational recommended procedure for storage of tools, equipment and fixture after completion of work		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 3 P: 5

Sl No.	Module Name	Session Name	Session Objectives	NOS Ref.	Methodology	Training Tools/Aids Duration	Duration (hh:mm)
		Support in Post-Assembly Operations –(Contd.)	8.List the different methods for disposing off waste material and scrap		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 4 P: 3
		Support in Post-Assembly Operations –(Contd.)					T: 0 P: 2
6.	Employability Skills (30 hours)	Introduction to Employability Skills	1.Discuss the importance of Employability Skills in meeting the job requirements	DGT/VS Q/N010 1	Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 0.5 P: 0.5
		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: 0.5
		Becoming a Professional in the 21st Century	1. Discuss 21st century skills.		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 0.5 P: 0.5
		Basic English Skills	1.Discuss need of basic English skills.		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 1 P: 1
		Communication Skills	1.Discuss need of communication skills 2.Describe importance of team work		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 1.5 P: 2.5

Sl No.	Module Name	Session Name	Session Objectives	NOS Ref.	Methodology	Training Tools/Aids Duration	Duration (hh:mm)
		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: 0.5 P: 0.5
		Financial and Legal Literacy	1. Discuss the significance of using financial products and services safely and securely. 2. Explain the importance of managing expenses, income, and savings. 3. Explain the significance of approaching the concerned authorities in time for any exploitation as per legal rights and laws.		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 1.5 P: 2.5
		Essential Digital Skills	1. 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: 1 P: 1
		Entrepreneurship	1. Discuss the need for identifying opportunities for potential business, sources for arranging money and potential legal and financial challenge		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 2.5 P: 4.5
		Customer Service	1. Differentiate between types of customers. 2. Explain the significance of identifying customer needs and addressing them.		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 1.5 P: 2.5

Sl No.	Module Name	Session Name	Session Objectives	NOS Ref.	Methodology	Training Tools/Aids Duration	Duration (hh:mm)
			3. Discuss the significance of maintaining hygiene and dressing appropriately				
		Getting ready for apprenticeship & Jobs	1. Discuss the significance of dressing up neatly and maintaining hygiene for an interview 2. Discuss how to search and register for apprenticeship opportunities		Interactive Lecture in the Class	Participant handbook, Projector, Whiteboard, Marker, and Duster	T: 1 P: 1
Total (In Hours)					Theory		127
					Practical		203
					On-the-Job Training		30
					*Grand Total (in Hours)		360 hours

Annexure II

Assessment Criteria

CRITERIA FOR ASSESSMENT OF TRAINEES

Assessment Criteria	
Job Role	Automotive Assembly Operator
Qualification Pack	ASC/Q3604, v4.0
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: 600	Compulsory NOS				
Assessable Outcomes	Assessment criteria for outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
1. ASC/N9803. Organize work and resources (Manufacturing)	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	-	1
	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	-	-	-
	PC10. wear and dispose PPEs regularly and appropriately	1	-	-	-
PC11. report advanced hygiene and sanitation issues to appropriate authority	1	1	-	-	

Total Marks: 600	Compulsory NOS				
Assessable Outcomes	Assessment criteria for outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
	PC12. follow stress and anxiety management techniques	1	1	-	-
	Perform work as per quality standards	5	3	-	2
	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	1	-	-
	PC17. follow processes specified for disposal of hazardous waste	2	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	-	-

Total Marks: 600	Compulsory NOS				
Assessable Outcomes	Assessment criteria for outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
	PC23. check if the equipment/machine is functioning normally before commencing work and rectify wherever required	2	2	-	1
	PC24. report malfunctioning (fumes/sparks/emission/vibration/noise) and lapse in maintenance of equipment	2	1	-	1
	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

Total Marks: 600	Compulsory NOS				
Assessable Outcomes	Assessment criteria for outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
	PC6. interpret Geometric Dimensioning and Tolerancing (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
	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/ N3617 Support the technician in vehicle assembly operations	Prepare for assembly activities	17	19	-	11
	PC1. identify the work to be done by interpreting the assembly drawing/work instructions/SOPs	4	2	-	2
	PC2. select the appropriate method of assembly on the basis of drawing information	4	-	-	2

Total Marks: 600	Compulsory NOS				
Assessable Outcomes	Assessment criteria for outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
	PC3. identify the tools, measuring instruments, equipment, auto components/parts and subassemblies 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	1	4	-	2
	PC6. setup the equipment required as per the selected assembling method	1	2	-	-
	PC7. ensure that the right programme is selected in case of robotic assembly method as defined in the SOP instructions	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

Total Marks: 600	Compulsory NOS				
Assessable Outcomes	Assessment criteria for outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
	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
	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

Total Marks: 600	Compulsory NOS				
Assessable Outcomes	Assessment criteria for outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
	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.	-	-	-	-
	Basic English Skills	2	3	-	-
	PC4. speak with others using some basic English phrases or sentences	-	-	-	-
	Communication Skills	1	1	-	-

Total Marks: 600	Compulsory NOS				
Assessable Outcomes	Assessment criteria for outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
	PC5. follow good manners while communicating with others	-	-	-	-
	PC6. work with others in a TEAM	-	-	-	-
	Communication Skills	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	1	2	-	1
	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: 600	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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