



# Automotive Assembly Lead Technician

QP Code: ASC/Q3602

Version: 2.0

NSQF Level: 5

Automotive Skills Development Council || 153, Gr Floor, Okhla Industrial Area, Phase - III, Leela Building  
New Delhi - 110020

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## ASC/Q3602: Automotive Assembly Lead Technician

### Brief Job Description

The individual is primarily involved in all assembly and quality check operations performed in automotive manufacturing. They support assembly operators and technicians in performing various assembly operations and inspection of assembled auto components.

### Personal Attributes

The person should be patient, organised, team-oriented and have the ability to work for long hours in adverse conditions. They should be keen observers and have an eye for detail and quality. The individual must also be able to communicate effectively and meet the deadlines for test results.

### Applicable National Occupational Standards (NOS)

#### Compulsory NOS:

1. [ASC/N9810: Manage work and resources \(Manufacturing\)](#)
2. [ASC/N9812: Interact effectively with team, customers and others](#)
3. [ASC/N9815: Manage shop floor operations and team](#)
4. [ASC/N9805: Interpret engineering drawing](#)
5. [ASC/N3614: Perform assembly and post-assembly operations](#)

### Qualification Pack (QP) Parameters

Sector	Automotive
Sub-Sector	Manufacturing
Occupation	Assembly
Country	India
NSQF Level	5
Aligned to NCO/ISCO/ISIC Code	NCO-2015/3122.0601

<b>Minimum Educational Qualification &amp; Experience</b>	<p>10th Class + I.T.I (Fitter) with 2 years of relevant experience</p> <p>OR</p> <p>12th Class with 4 years relevant experience</p> <p>OR</p> <p>3 years Diploma (Mechanical/Automobile/Instrumentation Engineering) from a recognized body (after class 12th)</p> <p>OR</p> <p>Certificate-NSQF (Automotive Assembly Technician Level 4) with 2 Years of relevant experience</p>
<b>Minimum Level of Education for Training in School</b>	
<b>Pre-Requisite License or Training</b>	NA
<b>Minimum Job Entry Age</b>	19 Years
<b>Last Reviewed On</b>	31/08/2021`
<b>Next Review Date</b>	31/08/2024
<b>NSQC Approval Date</b>	31/08/2021`
<b>Version</b>	2.0

## ASC/N9810: Manage work and resources (Manufacturing)

### Description

This NOS unit is about implementing safety, planning work, adopting sustainable practices for optimising the use of resources.

### Scope

The scope covers the following :

- Maintain safe and secure working environment
- Maintain Health and Hygiene
- Effective waste management practices
- Material/energy conservation practices

### Elements and Performance Criteria

#### *Maintain safe and secure working environment*

To be competent, the user/individual on the job must be able to:

- PC1. identify hazardous activities and the possible causes of risks or accidents in the workplace
- PC2. implement safe working practices for dealing with hazards to ensure safety of self and others
- PC3. conduct regular checks of the machines with support of the maintenance team to identify potential hazards
- PC4. ensure that all the tools/equipment/fasteners/spare parts are arranged as per specifications/utility into proper trays, cabinets, lockers as mentioned in the 5S guidelines/work instructions
- PC5. organise safety drills or training sessions to create awareness amongst others on the identified risks and safety practices
- PC6. fill daily check sheet to report improvements done and risks identified
- PC7. ensure that relevant safety boards/signs are placed on the shop floor for the safety of self and others
- PC8. report any identified breaches in health, safety and security policies and procedures to the designated person

#### *Maintain Health and Hygiene*

To be competent, the user/individual on the job must be able to:

- PC9. ensure workplace, equipment, restrooms etc. are sanitized regularly
- PC10. ensure team is aware about hygiene and sanitation regulations and following them on the shop floor
- PC11. ensure availability of running water, hand wash and alcohol-based sanitizers at the workplace
- PC12. report advanced hygiene and sanitation issues to appropriate authority
- PC13. follow stress and anxiety management techniques and support employees to cope with stress, anxiety etc
- PC14. wear and dispose PPEs regularly and appropriately

#### *Effective waste management practices*

To be competent, the user/individual on the job must be able to:

**PC15.** ensure recyclable, non-recyclable and hazardous wastes are segregated as per SOP

**PC16.** ensure proper mechanism is followed while collecting and disposing of non-recyclable, recyclable and reusable waste

#### *Material/energy conservation practices*

To be competent, the user/individual on the job must be able to:

**PC17.** ensure malfunctioning (fumes/sparks/emission/vibration/noise) and lapse in maintenance of equipment are resolved effectively

**PC18.** prepare and analyze material and energy audit reports to decipher excessive consumption of material and water

**PC19.** identify possibilities of using renewable energy and environment friendly fuels

**PC20.** identify processes where material and energy/electricity utilization can be optimized

### **Knowledge and Understanding (KU)**

The individual on the job needs to know and understand:

**KU1.** organisation procedures for health, safety and security, individual role and responsibilities in this context

**KU2.** the organisation's emergency procedures for different emergency situations and the importance of following the same

**KU3.** evacuation procedures for workers and visitors

**KU4.** how and when to report hazards as well as the limits of responsibility for dealing with hazards

**KU5.** potential hazards, risks and threats based on the nature of work

**KU6.** various types of fire extinguisher

**KU7.** various types of safety signs and their meaning

**KU8.** appropriate first aid treatment relevant to different condition e.g. bleeding, minor burns, eye injuries etc.

**KU9.** relevant standards, procedures and policies related to 5S followed in the company

**KU10.** the various materials used and their storage norms

**KU11.** importance of efficient utilisation of material and water

**KU12.** basics of electricity and prevalent energy efficient devices

**KU13.** common practices of conserving electricity

**KU14.** common sources and ways to minimize pollution

**KU15.** categorisation of waste into dry, wet, recyclable, non-recyclable and items of single-use plastics

**KU16.** waste management techniques

**KU17.** significance of greening

### **Generic Skills (GS)**

User/individual on the job needs to know how to:

- GS1. read safety instructions/guidelines
- GS2. modify work practices to improve them
- GS3. work with supervisors/team members to carry out work related tasks
- GS4. complete tasks efficiently and accurately within stipulated time
- GS5. inform/report to concerned person in case of any problem
- GS6. make timely decisions for efficient utilization of resources
- GS7. write reports such as accident report, in at least English/regional language



## Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Maintain safe and secure working environment</i>	20	13	-	8
PC1. identify hazardous activities and the possible causes of risks or accidents in the workplace	4	2	-	2
PC2. implement safe working practices for dealing with hazards to ensure safety of self and others	3	1	-	2
PC3. conduct regular checks of the machines with support of the maintenance team to identify potential hazards	2	2	-	1
PC4. ensure that all the tools/equipment/fasteners/spare parts are arranged as per specifications/utility into proper trays, cabinets, lockers as mentioned in the 5S guidelines/work instructions	3	2	-	1
PC5. organise safety drills or training sessions to create awareness amongst others on the identified risks and safety practices	2	-	-	-
PC6. fill daily check sheet to report improvements done and risks identified	2	2	-	-
PC7. ensure that relevant safety boards/signs are placed on the shop floor for the safety of self and others	2	2	-	1
PC8. report any identified breaches in health, safety and security policies and procedures to the designated person	2	2	-	1
<i>Maintain Health and Hygiene</i>	13	7	-	5
PC9. ensure workplace, equipment, restrooms etc. are sanitized regularly	3	2	-	1
PC10. ensure team is aware about hygiene and sanitation regulations and following them on the shop floor	2	1	-	-
PC11. ensure availability of running water, hand wash and alcohol-based sanitizers at the workplace	2	2	-	1
PC12. report advanced hygiene and sanitation issues to appropriate authority	1	1	-	1



Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC13. follow stress and anxiety management techniques and support employees to cope with stress, anxiety etc	2	1	-	1
PC14. wear and dispose PPEs regularly and appropriately	3	-	-	1
<i>Effective waste management practices</i>	<b>6</b>	<b>4</b>	-	<b>1</b>
PC15. ensure recyclable, non-recyclable and hazardous wastes are segregated as per SOP	3	2	-	-
PC16. ensure proper mechanism is followed while collecting and disposing of non-recyclable, recyclable and reusable waste	3	2	-	1
<i>Material/energy conservation practices</i>	<b>11</b>	<b>6</b>	-	<b>6</b>
PC17. ensure malfunctioning (fumes/sparks/emission/vibration/noise) and lapse in maintenance of equipment are resolved effectively	2	2	-	1
PC18. prepare and analyze material and energy audit reports to decipher excessive consumption of material and water	3	2	-	1
PC19. identify possibilities of using renewable energy and environment friendly fuels	3	1	-	2
PC20. identify processes where material and energy/electricity utilization can be optimized	3	1	-	2
<b>NOS Total</b>	<b>50</b>	<b>30</b>	-	<b>20</b>

## National Occupational Standards (NOS) Parameters

<b>NOS Code</b>	ASC/N9810
<b>NOS Name</b>	Manage work and resources (Manufacturing)
<b>Sector</b>	Automotive
<b>Sub-Sector</b>	Generic
<b>Occupation</b>	Generic
<b>NSQF Level</b>	5
<b>Credits</b>	TBD
<b>Version</b>	1.0
<b>Last Reviewed Date</b>	31/08/2021
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<b>NSQC Clearance Date</b>	31/08/2021

## ASC/N9812: Interact effectively with team, customers and others

### Description

This unit is about communicating with team members, superior and others.

### Scope

The scope covers the following :

- Communicate effectively with team members
- Interact with superiors
- Respect gender and ability differences

### Elements and Performance Criteria

#### *Communicate effectively with team members*

To be competent, the user/individual on the job must be able to:

- PC1. implement ways to share information with team members in line with organisational requirements
- PC2. ensure that work requirements are clearly communicated to the team members through all means including face-to-face, telephonic and written
- PC3. manage and co-ordinate with team members to integrate work as per requirements
- PC4. work in a way that show respect for all team members and customers
- PC5. carry out commitments made to team members and let them know in good time if there is any discrepancy with reasons
- PC6. resolve conflicts within the team members at work to achieve smooth workflow
- PC7. guide the team members to follow the organisation's policies and procedures
- PC8. ensure team goals are given preference over individual goals
- PC9. respect personal space of colleagues and customers

#### *Interact with superiors*

To be competent, the user/individual on the job must be able to:

- PC10. report progress on job allocated and team performance to the superiors
- PC11. escalate problems to superiors that cannot be handled
- PC12. train the team members to report completed work and receive feedback on work done
- PC13. encourage team members to rectify errors as per feedback and minimize mistakes in future

#### *Respect gender and ability differences*

To be competent, the user/individual on the job must be able to:

- PC14. ensure team shows sensitivity towards all genders and PwD
- PC15. adjust communication styles to reflect gender sensitivity and sensitivity towards person with disability
- PC16. help PwD team members to overcome the challenges, if asked

### Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1. the importance of effective communication and establishing good working relationships with team members and superiors
- KU2. different methods of communication as per the circumstances
- KU3. gender based concepts, issues and legislation
- KU4. organisation standards and guidelines to be followed for PwD
- KU5. rights and duties at workplace with respect to PwD
- KU6. organisation policies and procedures pertaining to written and verbal communication

### **Generic Skills (GS)**

User/individual on the job needs to know how to:

- GS1. read safety instructions/guidelines
- GS2. modify work practices to improve them
- GS3. work with supervisors/team members to carry out work related tasks
- GS4. complete tasks efficiently and accurately within stipulated time
- GS5. make timely decisions for efficient utilization of resources
- GS6. read instructions/guidelines/procedures
- GS7. write in English/any one language

## Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Communicate effectively with team members</i>	20	14	-	8
PC1. implement ways to share information with team members in line with organisational requirements	2	2	-	-
PC2. ensure that work requirements are clearly communicated to the team members through all means including face-to-face, telephonic and written	2	2	-	2
PC3. manage and co-ordinate with team members to integrate work as per requirements	2	1	-	2
PC4. work in a way that show respect for all team members and customers	3	1	-	2
PC5. carry out commitments made to team members and let them know in good time if there is any discrepancy with reasons	2	2	-	-
PC6. resolve conflicts within the team members at work to achieve smooth workflow	3	2	-	-
PC7. guide the team members to follow the organisation's policies and procedures	2	1	-	-
PC8. ensure team goals are given preference over individual goals	2	1	-	-
PC9. respect personal space of colleagues and customers	2	2	-	2
<i>Interact with superiors</i>	18	10	-	7
PC10. report progress on job allocated and team performance to the superiors	4	3	-	2
PC11. escalate problems to superiors that cannot be handled	4	2	-	1
PC12. train the team members to report completed work and receive feedback on work done	5	2	-	2
PC13. encourage team members to rectify errors as per feedback and minimize mistakes in future	5	3	-	2

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Respect gender and ability differences</i>	12	6	-	5
PC14. ensure team shows sensitivity towards all genders and PwD	4	2	-	2
PC15. adjust communication styles to reflect gender sensitivity and sensitivity towards person with disability	4	2	-	2
PC16. help PwD team members to overcome the challenges, if asked	4	2	-	1
<b>NOS Total</b>	<b>50</b>	<b>30</b>	<b>-</b>	<b>20</b>

## National Occupational Standards (NOS) Parameters

<b>NOS Code</b>	ASC/N9812
<b>NOS Name</b>	Interact effectively with team, customers and others
<b>Sector</b>	Automotive
<b>Sub-Sector</b>	Generic
<b>Occupation</b>	Generic
<b>NSQF Level</b>	5
<b>Credits</b>	TBD
<b>Version</b>	1.0
<b>Last Reviewed Date</b>	31/08/2021
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<b>NSQC Clearance Date</b>	31/08/2021



## ASC/N9815: Manage shop floor operations and team

### Description

This NOS is about managing manpower and availability of material on shop floor for a shift/line. It is also about supervising production operations and implementing process and team improvement practices for achieving the targets.

### Scope

The scope covers the following :

- Manage manpower and material for the shift/line
- Supervise Production Operations
- Implement process improvement techniques
- Implement team improvement practices

### Elements and Performance Criteria

#### *Manage manpower and material for the shift/line*

To be competent, the user/individual on the job must be able to:

- PC1. allocate manpower based on skill matrix at work station to achieve production targets
- PC2. support Shift In Charge/Process head/Shop head in finalizing the shift rosters for the week and month based on the production plan
- PC3. maintain the information on leaves/IN-Out time and shift/line overtime of the team and share the information with the concerned authorities as per the organisational procedures
- PC4. send inventory requirements to stores and purchase department and follow up with them to ensure the timely/receipt of material (Spares, Consumables)
- PC5. maintain the movement of material and work piece on the shop floor according to the TAKT time prescribed in the SOP/Work Plans
- PC6. ensure that the operators and helpers have the required tools and equipment at the start of production process
- PC7. ensure optimal resource utilization (man, machine and material) and streamlining of activities within the shift

#### *Supervise Production Operations*

To be competent, the user/individual on the job must be able to:

- PC8. co-ordinate with other departments like stores, paint shop, assembly line, quality, safety, production planning etc. regarding resolution of inter-related problems and achieving required production target and quality standards
- PC9. implement corrective actions to reduce losses and wastages during shift operation and minimum rejection of components
- PC10. prepare daily and monthly production MIS reports to analyse the actual performance with the production target and report the same to production incharge
- PC11. verify the production and material movement related data entries in the system (manual/ERP) for the line/shift and ensure correctness of the data
- PC12. support the maintenance team in finalizing and executing the preventive maintenance schedule for the shop/line

**PC13.** support the In charge/Engineer/Shop Head in analysing the various data sheets and reports related to production, maintenance, manpower deployment etc.

*Implement process improvement techniques*

To be competent, the user/individual on the job must be able to:

**PC14.** analyse possible areas of improvements in production line and identify corrective measures to address the gaps

**PC15.** carry out audit of production process for capability of each operation and prepare reports on the non-compliances for the regulatory authorities by following organizational procedures

**PC16.** implement various process improvement techniques like Kaizen, 5S, Poka Yoke, TQM etc. on the production line to rectify the failure and gaps in the production process

**PC17.** analyse machine breakdown trends and current maintenance process to identify areas of improvement and corrective actions for improving the same

**PC18.** monitor and review the effectiveness of process improvement techniques and corrective actions on production and prepare reports for the regulatory authorities on the same

*Implement team improvement practices*

To be competent, the user/individual on the job must be able to:

**PC19.** encourage team members/operators to suggest quality improvement measures through suggestion schemes, evaluate feasibility of the ideas and discuss their implementation with seniors

**PC20.** conduct daily floor meeting/morning meetings/staff meetings to communicate the information such as production targets, new guidelines, new processes etc. to team

**PC21.** organise training sessions for the operators and technicians to improve their skills and knowledge on new techniques and methods

**PC22.** resolve grievances within the team or escalate them to the concerned authorities if they are beyond the scope

**PC23.** counsel employees for any work related issues or any personal problems highlighted by the employee

## **Knowledge and Understanding (KU)**

The individual on the job needs to know and understand:

**KU1.** relevant manufacturing, quality and maintenance standards and procedures followed in the organisation

**KU2.** functional processes like Procurement, Store management, inventory management, quality management and key contact points for query resolution.

**KU3.** requirement of raw materials, tools and equipment on the shift/line

**KU4.** how to prepare shift roster and maintain performance information of the team

**KU5.** use of ERP system for maintaining and updation production line data

**KU6.** various documents and reports need to maintain and prepare related to production process

**KU7.** various process improvement techniques like Kaizen, 5S, Poka Yoke, TQM etc

**KU8.** how to analyse and audit gaps and issues in production process

**KU9.** various employee engagement and development practice

**KU10.** how to handle and solve employee grievances

## Generic Skills (GS)

User/individual on the job needs to know how to:

- GS1. read and interpret work instructions, reports and process documents
- GS2. communicate the production requirements to theseniros and other departments
- GS3. communicate issues to the supervisor that occur during production process
- GS4. attentively listen and comprehend the information given by the master technician/team members
- GS5. write reports related to production process in English/regional language
- GS6. recognise a workplace problem and take suitable action
- GS7. analyse and apply the information gathered from observation, experience, reasoning or communication to act efficiently
- GS8. plan and organise work according to the work requirements
- GS9. report to the supervisor or deal with a colleague individually, depending on the type of concern
- GS10. complete the assigned tasks with minimum supervision
- GS11. explore new approach of doing things to resolve issues
- GS12. suggest improvements (if any) in current ways of working

## Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Manage manpower and material for the shift/line</i>	6	9	-	6
PC1. allocate manpower based on skill matrix at work station to achieve production targets	1	2	-	1
PC2. support Shift In Charge/Process head/Shop head in finalizing the shift rosters for the week and month based on the production plan	2	1	-	1
PC3. maintain the information on leaves/IN-Out time and shift/line overtime of the team and share the information with the concerned authorities as per the organisational procedures	1	1	-	1
PC4. send inventory requirements to stores and purchase department and follow up with them to ensure the timely/receipt of material (Spares, Consumables)	1	1	-	1
PC5. maintain the movement of material and work piece on the shop floor according to the TAKT time prescribed in the SOP/Work Plans	1	1	-	1
PC6. ensure that the operators and helpers have the required tools and equipment at the start of production process	-	2	-	-
PC7. ensure optimal resource utilization (man, machine and material) and streamlining of activities within the shift	-	1	-	1
<i>Supervise Production Operations</i>	14	8	-	5
PC8. co-ordinate with other departments like stores, paint shop, assembly line, quality, safety, production planning etc. regarding resolution of inter-related problems and achieving required production target and quality standards	1	2	-	1
PC9. implement corrective actions to reduce losses and wastages during shift operation and minimum rejection of components	2	1	-	1
PC10. prepare daily and monthly production MIS reports to analyse the actual performance with the production target and report the same to production incharge	3	1	-	1

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC11. verify the production and material movement related data entries in the system (manual/ERP) for the line/shift and ensure correctness of the data	3	1	-	1
PC12. support the maintenance team in finalizing and executing the preventive maintenance schedule for the shop/line	2	1	-	-
PC13. support the In charge/Engineer/Shop Head in analysing the various data sheets and reports related to production, maintenance, manpower deployment etc.	3	2	-	1
<i>Implement process improvement techniques</i>	<b>18</b>	<b>8</b>	-	<b>7</b>
PC14. analyse possible areas of improvements in production line and identify corrective measures to address the gaps	3	1	-	1
PC15. carry out audit of production process for capability of each operation and prepare reports on the non-compliances for the regulatory authorities by following organizational procedures	3	1	-	1
PC16. implement various process improvement techniques like Kaizen, 5S, Poka Yoke, TQM etc. on the production line to rectify the failure and gaps in the production process	6	2	-	2
PC17. analyse machine breakdown trends and current maintenance process to identify areas of improvement and corrective actions for improving the same	3	2	-	1
PC18. monitor and review the effectiveness of process improvement techniques and corrective actions on production and prepare reports for the regulatory authorities on the same	3	2	-	2
<i>Implement team improvement practices</i>	<b>12</b>	<b>5</b>	-	<b>2</b>
PC19. encourage team members/operators to suggest quality improvement measures through suggestion schemes, evaluate feasibility of the ideas and discuss their implementation with seniors	3	1	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC20. conduct daily floor meeting/morning meetings/staff meetings to communicate the information such as production targets, new guidelines, new processes etc. to team	2	1	-	1
PC21. organise training sessions for the operators and technicians to improve their skills and knowledge on new techniques and methods	3	1	-	-
PC22. resolve grievances within the team or escalate them to the concerned authorities if they are beyond the scope	2	1	-	1
PC23. counsel employees for any work related issues or any personal problems highlighted by the employee	2	1	-	-
<b>NOS Total</b>	<b>50</b>	<b>30</b>	<b>-</b>	<b>20</b>

## National Occupational Standards (NOS) Parameters

<b>NOS Code</b>	ASC/N9815
<b>NOS Name</b>	Manage shop floor operations and team
<b>Sector</b>	Automotive
<b>Sub-Sector</b>	Generic
<b>Occupation</b>	Generic
<b>NSQF Level</b>	5
<b>Credits</b>	TBD
<b>Version</b>	1.0
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<b>NSQC Clearance Date</b>	31/08/2021



## ASC/N9805: Interpret engineering drawing

### Description

This NOS unit is about reading and interpreting all concepts, symbols, methods, views, etc. of engineering drawing.

### Scope

The scope covers the following :

- Interpret information from various views, projection, 2D and 3D shapes
- Identify drawing standards and symbols
- Modification and storage of drawing

### Elements and Performance Criteria

#### *Interpret information from various views, projection, 2D and 3D shapes*

To be competent, the user/individual on the job must be able to:

- PC1. interpret engineering drawing's uniqueness, dimensions and important features in 2D and 3D shapes
- PC2. identify the difference between 2D and 3D shapes
- PC3. explain difference between first angle projection and third angle projection in mechanical engineering drawing
- 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
- PC5. identify details of the machine component which are not clearly visible by interpreting section views

#### *Identify drawing standards and symbols*

To be competent, the user/individual on the job must be able to:

- PC6. interpret Geometric Dimensioning and Tolerancing (GD&T) symbols in the drawings
- 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
- PC8. identify the sequence of operations which enables the selection and prioritization of the datums
- PC9. read and interpret information from Tolerance Zone boundaries for part features in terms of shape and size

#### *Modification and storage of drawing*

To be competent, the user/individual on the job must be able to:

- PC10. observe any modification, changes required in the drawing and communicate the same to the concerned team in the organization
- PC11. store the drawings in an easily accessible place, avoiding damage from moisture, chemicals and fire

### Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1. relevant organisational standards such as work standard, Standard Operating Procedure, quality process, maintenance standards etc. followed in the company
- KU2. importance of cycle-time and required output as per work order and work instructions
- KU3. drawing standards used by the company
- KU4. use of drawing tools such as scales, compass, types of pencils, CAD and CAM software etc.
- KU5. the basics of engineering drawing, orthographic projection, isometric projection, GD&T etc.
- KU6. importance of various projections, views, symbols and dimensions of drawing
- KU7. use of geometric shapes like lines, angles, circles, etc for interpreting the drawing

### **Generic Skills (GS)**

User/individual on the job needs to know how to:

- GS1. read and interpret workplace related drawing
- GS2. communicate the changes and requirements to supervisor by using relevant drawing terms and nomenclature
- GS3. attentively listen and comprehend the information given by the supervisor/team members
- GS4. write in English/regional language
- GS5. recognise problem in drawing and take suitable action
- GS6. analyse and apply the information gathered from observation, experience, reasoning or communication to act efficiently

## Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Interpret information from various views, projection, 2D and 3D shapes</i>	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
<i>Identify drawing standards and symbols</i>	23	15	-	8
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
<i>Modification and storage of drawing</i>	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

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC11. store the drawings in an easily accessible place, avoiding damage from moisture, chemicals and fire	3	2	-	1
<b>NOS Total</b>	<b>50</b>	<b>30</b>	<b>-</b>	<b>20</b>

## National Occupational Standards (NOS) Parameters

NOS Code	ASC/N9805
NOS Name	Interpret engineering drawing
Sector	Automotive
Sub-Sector	Generic
Occupation	Generic
NSQF Level	5
Credits	TBD
Version	1.0
Last Reviewed Date	31/08/2021
Next Review Date	31/08/2024
NSQC Clearance Date	31/08/2021

## ASC/N3614: Perform assembly and post-assembly operations

### Description

This NOS is about performing end to end assembling operations to ensure that the final products manufactured is as per the quality, cost and production norms set by the organization

### Scope

The scope covers the following :

- Prepare for the assembly operations
- Perform assembly operations
- Conduct quality check of production as per norms
- Manage post-assembly activities

### Elements and Performance Criteria

#### *Prepare for the assembly operations*

To be competent, the user/individual on the job must be able to:

- PC1. identify the work to be done by interpreting the assembly drawing/blue print, assembly Work Instructions/SOPs and take inputs from the master assembly technician regarding production planning
- PC2. prepare plan and schedule to meet the production target and give instructions to the assembly operators and technicians about the processes required to be performed for achieving the same
- PC3. ensure that all the measuring instruments, equipment, auto components/parts and subassemblies required for the job are in stock, functioning properly and are available on the shop floor
- PC4. select the correct assembly method, equipment and apparatus for conducting the process
- PC5. fill CLRI (Clean, Lubricate, Retighten & Inspection) check sheet and report to the supervisor about any abnormalities identified and action taken to resolve them
- PC6. ensure that assembly operators and technicians are using calibrated and cleaned tools, measuring instruments and equipment
- PC7. check that assembly apparatus is set properly as per the selected assembly method
- PC8. guide the assembly operators and technicians in setting of the assembly parameters as per the work instructions
- PC9. 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

#### *Perform assembly operations*

To be competent, the user/individual on the job must be able to:

- PC10. perform assembly operation and assemble all the required parts using mechanical, pneumatic, hydraulic and electrical controlled assembly tools
- PC11. use the specified types of screws, nuts, clamps, rivets for fitting the required components and also validate that the assembly of components is as per the process laid out in the process manual/ Work Instructions

- PC12. perform settings and adjustments of all the safety and high precision items such as backlash adjustment, run-out adjustment, toe-in and toe-out adjustment, camber and castor angle adjustment, brake fluid air removal, steering rod adjustment, piston assembly, crankshaft assembly, differential assembly etc. as per SOP
- PC13. participate in the warranty analysis activities in the department and provide solutions to set-it right
- PC14. follow the TAKT time prescribed by the process excellence team for every assembly station
- PC15. ensure that assembly operators and technicians are following the do's and don'ts of the assembly process as defined in SOPs/Work Instructions
- PC16. take appropriate action in case of any irregularities e.g. power failure, rejection, tool breakage etc.

*Conduct quality check of production as per norms*

To be competent, the user/individual on the job must be able to:

- PC17. ensure that every manufactured vehicle/ aggregate component is checked and tested as per the SOP/WI
- PC18. check the assembled auto components as per the control plan, work instructions for product quality
- PC19. inspect the assembled auto components for defects if any, such as in paint, dents, grooves, cracks, rough edges etc. on the physical body of the auto component
- PC20. ensure that all the errors are tagged/ marked immediately so that they can be rectified at the earliest
- PC21. conduct visual inspection of the bundled electrical and electronics wiring, circuits, harness, connectors and terminal orientation
- PC22. conduct short circuit and open circuit test in the circuit wiring
- PC23. ensure that all the tests mentioned for electrical and mechanical assembly are conducted as per the checklist and report the same to the relevant authorities or take action for its improvement
- PC24. ensure that assembly operators and technicians are recording all the test observations and errors in the log books as per the format shared

*Manage post-assembly activities*

To be competent, the user/individual on the job must be able to:

- PC25. support the assembly operators and technicians in minor machine maintenance activities such as oiling or cleaning of machine and its components as per the checklist
- PC26. check the machine operation for proper working after maintenance activities
- PC27. prepare and maintain records related to assembly and maintenance activities done for the higher authorities

## **Knowledge and Understanding (KU)**

The individual on the job needs to know and understand:

- KU1. relevant standards and procedures followed in the company
- KU2. various components and systems of a vehicle
- KU3. various assembly operations and methods
- KU4. the process flow of the assembly operations



- KU5.** SOP recommended by the manufacturer for using hand tools, measuring instruments and equipments required during the assembly process
- KU6.** impact of various assembly process like bolting, torqueing, tightening, fitting, greasing, hammering, sealing, clamping on the final component/vehicle
- KU7.** connection of all the electrical terminals as per wiring diagram
- KU8.** various types of defects and their effect on final assembly
- KU9.** the post assembling processes like inspection, cleaning etc.
- KU10.** the various inspection methods for inspecting the final assembly
- KU11.** safety requirements during the assembling work
- KU12.** how to visualize the final product output and conduct quality verification tests

## **Generic Skills (GS)**

User/individual on the job needs to know how to:

- GS1.** read and interpret work instructions, assembly drawings, reports and process documents
- GS2.** communicate the assembly requirements to the seniors and other departments
- GS3.** attentively listen and comprehend the information given by the master technician/team members
- GS4.** write reports related to production process in English/regional language
- GS5.** recognise a workplace problem and take suitable action
- GS6.** analyse and apply the information gathered from observation, experience, reasoning or communication to act efficiently
- GS7.** report to the supervisor or deal with a colleague individually, depending on the type of concern
- GS8.** complete the assigned tasks with minimum supervision
- GS9.** suggest improvements (if any) in current ways of working

## Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Prepare for the assembly operations</i>	10	17	-	7
PC1. identify the work to be done by interpreting the assembly drawing/blue print, assembly Work Instructions/SOPs and take inputs from the master assembly technician regarding production planning	1	2	-	-
PC2. prepare plan and schedule to meet the production target and give instructions to the assembly operators and technicians about the processes required to be performed for achieving the same	1	2	-	1
PC3. ensure that all the measuring instruments, equipment, auto components/parts and subassemblies required for the job are in stock, functioning properly and are available on the shop floor	1	2	-	2
PC4. select the correct assembly method, equipment and apparatus for conducting the process	2	2	-	-
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	2	-	1
PC6. ensure that assembly operators and technicians are using calibrated and cleaned tools, measuring instruments and equipment	1	2	-	1
PC7. check that assembly apparatus is set properly as per the selected assembly method	1	1	-	-
PC8. guide the assembly operators and technicians in setting of the assembly parameters as per the work instructions	1	2	-	1
PC9. 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	1	2	-	1
<i>Perform assembly operations</i>	8	15	-	6

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10. perform assembly operation and assemble all the required parts using mechanical, pneumatic, hydraulic and electrical controlled assembly tools	1	3	-	1
PC11. use the specified types of screws, nuts, clamps, rivets for fitting the required components and also validate that the assembly of components is as per the process laid out in the process manual/ Work Instructions	1	2	-	1
PC12. perform settings and adjustments of all the safety and high precision items such as backlash adjustment, run-out adjustment, toe-in and toe-out adjustment, camber and castor angle adjustment, brake fluid air removal, steering rod adjustment, piston assembly, crankshaft assembly, differential assembly etc. as per SOP	2	4	-	2
PC13. participate in the warranty analysis activities in the department and provide solutions to set-it right	1	2	-	1
PC14. follow the TAKT time prescribed by the process excellence team for every assembly station	1	-	-	-
PC15. ensure that assembly operators and technicians are following the do's and don'ts of the assembly process as defined in SOPs/Work Instructions	1	2	-	1
PC16. take appropriate action in case of any irregularities e.g. power failure, rejection, tool breakage etc.	1	2	-	-
<i>Conduct quality check of production as per norms</i>	<b>9</b>	<b>14</b>	-	<b>5</b>
PC17. ensure that every manufactured vehicle/ aggregate component is checked and tested as per the SOP/WI	2	2	-	-
PC18. check the assembled auto components as per the control plan, work instructions for product quality	2	2	-	1
PC19. inspect the assembled auto components for defects if any, such as in paint, dents, grooves, cracks, rough edges etc. on the physical body of the auto component	1	2	-	1

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC20. ensure that all the errors are tagged/ marked immediately so that they can be rectified at the earliest	-	2	-	-
PC21. conduct visual inspection of the bundled electrical and electronics wiring, circuits, harness, connectors and terminal orientation	1	2	-	1
PC22. conduct short circuit and open circuit test in the circuit wiring	1	2	-	1
PC23. ensure that all the tests mentioned for electrical and mechanical assembly are conducted as per the checklist and report the same to the relevant authorities or take action for its improvement	1	1	-	1
PC24. ensure that assembly operators and technicians are recording all the test observations and errors in the log books as per the format shared	1	1	-	-
<i>Manage post-assembly activities</i>	3	4	-	2
PC25. support the assembly operators and technicians in minor machine maintenance activities such as oiling or cleaning of machine and its components as per the checklist	1	1	-	1
PC26. check the machine operation for proper working after maintenance activities	1	2	-	-
PC27. prepare and maintain records related to assembly and maintenance activities done for the higher authorities	1	1	-	1
<b>NOS Total</b>	<b>30</b>	<b>50</b>	<b>-</b>	<b>20</b>

## National Occupational Standards (NOS) Parameters

<b>NOS Code</b>	ASC/N3614
<b>NOS Name</b>	Perform assembly and post-assembly operations
<b>Sector</b>	Automotive
<b>Sub-Sector</b>	Manufacturing
<b>Occupation</b>	Assembly
<b>NSQF Level</b>	5
<b>Credits</b>	TBD
<b>Version</b>	2.0
<b>Last Reviewed Date</b>	31/08/2021
<b>Next Review Date</b>	31/08/2024
<b>NSQC Clearance Date</b>	31/08/2021

## Assessment Guidelines and Assessment Weightage

### Assessment Guidelines

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

**Minimum Aggregate Passing % at QP Level : 70**

(Please note: Every Trainee should score a minimum aggregate passing percentage as specified above, to successfully clear the Qualification Pack assessment.)

## Assessment Weightage

### Compulsory NOS

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
ASC/N9810.Manage work and resources (Manufacturing)	50	30	-	20	100	10
ASC/N9812.Interact effectively with team, customers and others	50	30	-	20	100	10
ASC/N9815.Manage shop floor operations and team	50	30	-	20	100	5
ASC/N9805.Interpret engineering drawing	50	30	-	20	100	35
ASC/N3614.Perform assembly and post-assembly operations	30	50	-	20	100	40
<b>Total</b>	<b>230</b>	<b>170</b>	<b>-</b>	<b>100</b>	<b>500</b>	<b>100</b>

## Acronyms

<b>NOS</b>	National Occupational Standard(s)
<b>NSQF</b>	National Skills Qualifications Framework
<b>QP</b>	Qualifications Pack
<b>TVET</b>	Technical and Vocational Education and Training
<b>MIS</b>	Management Information System
<b>ERP</b>	Enterprise Resource Planning
<b>TQM</b>	Total Quality Management
<b>MIS</b>	Management Information System
<b>ERP</b>	Enterprise Resource Planning
<b>TQM</b>	Total Quality Management
<b>SOP</b>	Standard Operating Procedure
<b>GD&amp;T</b>	Geometric Dimensioning & Tolerancing
<b>CAD</b>	Computer-Aided Drafting
<b>CAM</b>	Computer-Aided Manufacturing
<b>CLRI</b>	Clean, Lubricate, Retighten & Inspection



## Glossary

<b>Sector</b>	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.
<b>Sub-sector</b>	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
<b>Occupation</b>	Occupation is a set of job roles, which perform similar/ related set of functions in an industry.
<b>Job role</b>	Job role defines a unique set of functions that together form a unique employment opportunity in an organisation.
<b>Occupational Standards (OS)</b>	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.
<b>Performance Criteria (PC)</b>	Performance Criteria (PC) are statements that together specify the standard of performance required when carrying out a task.
<b>National Occupational Standards (NOS)</b>	NOS are occupational standards which apply uniquely in the Indian context.
<b>Qualifications Pack (QP)</b>	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.
<b>Unit Code</b>	Unit code is a unique identifier for an Occupational Standard, which is denoted by an 'N'
<b>Unit Title</b>	Unit title gives a clear overall statement about what the incumbent should be able to do.
<b>Description</b>	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.
<b>Scope</b>	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.
<b>Knowledge and Understanding (KU)</b>	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.

<b>Organisational Context</b>	Organisational context includes the way the organisation is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
<b>Technical Knowledge</b>	Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
<b>Core Skills/ Generic Skills (GS)</b>	Core skills or Generic Skills (GS) are a group of skills that are the key to learning and working in today's world. These skills are typically needed in any work environment in today's world. These skills are typically needed in any work environment. In the context of the OS, these include communication related skills that are applicable to most job roles.
<b>Electives</b>	Electives are NOS/set of NOS that are identified by the sector as contributive to specialization in a job role. There may be multiple electives within a QP for each specialized job role. Trainees must select at least one elective for the successful completion of a QP with Electives.
<b>Options</b>	Options are NOS/set of NOS that are identified by the sector as additional skills. There may be multiple options within a QP. It is not mandatory to select any of the options to complete a QP with Options.