Automotive Skills Development Council

QUALIFICATIONS PACK - OCCUPATIONAL STANDARDS FOR AUTOMOTIVE INDUSTRY

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What are Occupational Standards (OS)?

- OS describe what individuals need to do, know and understand in order to carry out a particular job role or function
- OS are performance standards that individuals must achieve when carrying out functions in the workplace, together with specifications of the underpinning knowledge and understanding

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Introduction

Qualification Pack-Vehicle Assembly Fitter

SECTOR: AUTOMOTIVE

SUB-SECTOR: MANUFACTURING

OCCUPATION: ASSEMBLY

JOB ROLE: VEHICLE ASSEMBLY FITTER

REFERENCE ID: ASC/Q3601

ALIGNED TO: NCO-2004/8281.65/.70

Vehicle Assembly Fitter: The role entails operating a variety of machine tools to assemble mechanical and electrical components for two wheelers, 4 wheelers and large commercial vehicles

Brief Job Description: A Vehicle assembly fitter is one who is skilled in operating machine tools for conducting assembly operation as per the required vehicle assembly norms. Assembly of components includes engines, transmission components, electrical and electronic circuit and components, dashboards, seating system, wheels, doors etc. at the required locations and as per required vehicle type/ batch

Personal Attributes: The person should have dexterity in operating machine tools, ability to fix the right parts at the right places in the given time ,patience to do repeated work, two hand and eye coordination, sense of time management, quality management and 5S & Safety, Proper vision and no colour blindness

Job Details

Qualifications Pack Code	**ASC/Q3601**		
Job Role	**Vehicle Assembly Fitter**		
Credits(NSQF)	**TBD**	**Version number**	**1.0**
Industry	**Automotive**	**Drafted on**	**5/9/2013**
Sub-sector	**Manufacturing**	**Last reviewed on**	**15/9/2013**
Occupation	**Assembly**	**Next review date**	**Under revision expected date of revised version 31-dec-15**
NSQC Clearance on	**20/07/15**		

Job Role	**Vehicle Assembly Fitter**
Role Description	Responsible for assembly operation of vehicles like 2 wheelers, 3 wheeler, 4 wheelers and large commercial vehicles
NSQF level	4
Minimum Educational Qualifications	10th Pass
Maximum Educational Qualifications	ITI Mechanical/ BSc
Training (Suggested but not mandatory)	• 5S and Safety • Quality Management and Poke Yoke practices • Usage of different tools for assembly operations • Basic vehicle testing tools and techniques • Problem solving
Minimum Job Entry Age	1 ASDC recommends that candidates should seek full employment not before attaining an age of 18 years. 2 However, as per Factories Act1948 : - No one can be employed before attaining the age of 15 - A person between the age of 15 – 18 (both inclusive) could be employed only With employers who follow safety and security systems & processes and also that the employee in this bracket will be working under supervision. 3 Please note that under the Factories Act 1948, different States may have slightly varying provision which need to be adhered to.
Experience	1-2 year in assembly operations

Occupational Standards (OS)	1. ASC/N3609:Understand processes and equipment requirement for assembly operation of vehicles 2. ASC/N3610:Prepare the machine, auxiliaries and work pieces for vehicle assembly 3. ASC/N3611:Perform the Mechanical Assembling operation for all mechanical components 4. ASC/N3612:Perform the electrical assembly operation 5. ASC/N/3613: Perform the Quality Checks and Inspection of the finished products (Auto Components/ Vehicles) 6. ASC/N0006: Maintain a safe and healthy working environment 7. ASC/N0021: Maintain 5S at the work premises
Performance Criteria	As described in the relevant NOS units

Definitions

Keywords /Terms	Description
Core Skills/Generic Skills	Core Skills or Generic Skills are a group of skills that are key to learning and working in today's world. These skills are typically needed in any work environment. In the context of the NOS, these include communication related skills that are applicable to most job roles.
Function	Function is an activity necessary for achieving the key purpose of the sector, occupation, or area of work, which can be carried out by a person or a group of persons. Functions are identified through functional analysis and form the basis of NOS.
Job role	Job role defines a unique set of functions that together form a unique employment opportunity in an organization.
Knowledge and Understanding	Knowledge and Understanding are statements which together specify the technical, generic, professional and organizational specific knowledge that an individual needs in order to perform to the required standard.
National Occupational Standards (NOS)	NOS are Occupational Standards which apply uniquely in the Indian context
Occupation	Occupation is a set of job roles, which perform similar/related set of functions in an industry.
Organisational Context	Organisational Context includes the way the organization is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
Performance Criteria	Performance Criteria are statements that together specify the standard of performance required when carrying out a task.
Qualifications Pack(QP)	Qualifications Pack comprises the set of NOS, together with the educational, training and other criteria required to perform a job role. A Qualifications Pack is assigned a unique qualification pack code.
Qualifications Pack Code	Qualifications Pack Code is a unique reference code that identifies a qualifications pack.
Scope	Scope is the 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 the quality of performance required.
Sector	Sector is a conglomeration of different business operations having similar businesses 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.
Sub-functions	Sub-functions are sub-activities essential to fulfil the achieving the objectives of the function.
Technical Knowledge	Technical Knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
Unit Code	Unit Code is a unique identifier for a NOS unit, which can be denoted with an '**N**'
Unit Title	Unit Title gives a clear overall statement about what the incumbent should be able to do.
Vertical	Vertical may exist within a sub-sector representing different domain areas or the client industries served by the industry.

Acronyms

Keywords /Terms	Description
NOS	National Occupational Standard(s)
NSQF	National Standards Qualifications Framework
OEM	Original Equipment Manufacturer
OS	Occupational Standard(s)
QP	Qualifications Pack

National Occupational Standards

Overview

This unit is about understanding the job requirement and hence understand the activities & equipment associated with the process to complete the task.

ASC/N3609 **Understand processes and equipment requirement for assembly operation of vehicles**

National Occupational Standard

Unit Code	ASC/N3609
Unit Title (Task)	Understand processes and equipment requirement for assembly operation of vehicles
Description	This NOS unit is about understanding the job requirement, what processes need to be executed, what equipment will be used for the project and what is the required output considering the standards specified
Scope	The Vehicle Assembly Fitter will be responsible for • Understanding the tool and equipment requirement for the process • Escalations of any queries regarding the job The role holder will interact with the Paint shop, Weld shop, maintenance team, QA/QC, material management team and vehicle testing team. The activities will be similar for Body on Frame/ Monocoque assembly

Performance Criteria (PC) w.r.t. the Scope	
Element	**Performance Criteria**
Understand the assembling requirements, assembling equipment and parameters to be set for the process	PC1. Understand the right assembling methodology and process(Bolting, tightening, riveting, fastening, adhesive clamping, crimping etc) using mechanical, pneumatic, hydraulic means to be adopted for completing the work order through discussions with the supervisor/ master technician and reading the process manuals/ Work Instructions/Standard Operating Procedures PC2. Understand the various assembling process parameters like cycle time, pressure, torque etc. before starting the assembling process, as mentioned in the Work Instructions/ SOP manual PC3. Understand the material required and the equipment availability for executing the activity PC4. Understand the type of nut runners and to requiring equipment required to be used for the assembling process

	PC5. Understand the various nuts, bolts, rivets, fasteners, covering sheaths etc kept in the various side trays (Assembly kits) PC6. Understand 5 S and Safety related aspects related to the work station, assembly Line PC7. Clearly understanding the does and don'ts of the manufacturing process as defined in SOPs/ Work Instructions or defined by supervisors
Escalations of queries on the given job	PC8. Refer the queries to a competent internal specialist if they cannot be resolved by the assembler on own PC9. Obtain help or advice from specialist if the problem is outside his/her area of competence or experience PC10. Confirm self-understanding with the specialist holding discussions so that all doubts & queries can be resolved before the actual process execution
Knowledge and Understanding (K) w.r.t. the scope	
Element	**Knowledge and Understanding**
A. Organizational Context (Knowledge of the company / organization and its processes)	The user/individual on the job needs to know and understand: KA1. relevant standards and procedures followed in the company KA2. different types of products manufactured by the company KA3. functional processes like Procurement, Store management, inventory management, quality management and key contact points for query resolution
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. different types of assembling processes and associated equipments KB2. the method of reading and interpreting the various gauges KB3. how to visualize the final product output and conduct quality verification tests. KB4. the impact of various physical parameters like to rqueing and tightening on the properties of final output product like durability, surface finish, part movement, a estheticsetc KB5. hazards and safety aspects involved in assembling activities and usage of

	relevant PPEs
Skills (S) [Optional]	
Element	**Skills**
Element **A. Core Skills/ Generic Skills**	**Writing Skills**
	The user/ individual on the job needs to know and understand how to: SA1. document information SA2. note down observations (if any) related to the assembling process SA3. write information documents to internal departments/ internal teams or enter the information in online ERP systems under guidance of the supervisor
	Reading Skills
	The user/individual on the job needs to know and understand how to: SA4. read and interpret technical specifications of the assemble specimen SA5. read equipment manuals and process documents to understand the equipment and processes better SA6. read internal information documents sent by internal teams
	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to: SA7. discuss task lists, schedules and activities with the supervisor SA8. effectively communicate with the team members SA9. question the assembling shop supervisor in order to understand the nature of the problem and to clarify queries SA10. attentively listen with full attention and comprehend the information given by the speaker
B. Professional Skills	**Plan and Organize**
	The user/individual on the job needs to know and understand how to: SB1. plan and organize the work order and jobs received from the Operator SB2. organize all process/ equipment manuals so that sorting/ accessing

ASC/N3609	Understand processes and equipment requirement for assembly operation of vehicles

	information is easy SB3. keep fixtures, tools, drawings, Work Instructions, SOP manuals as per the part number, colour codes etc. as defined under the 5S systems SB4. support the supervisor in scheduling tasks for helper and assistant supervisor
	Judgment and Critical Thinking
	The user/individual on the job needs to know and understand how to: SB5. use common sense and make judgments during day to day basis SB6. use reasoning skills to identify and resolve basic problems use intuition and keen observation skills to detect any potential problems which could arise during operations
	Desire to learn and take initiatives
	The user/individual on the job needs to know and understand how to: SB7. follow instructions and work on areas of improvement identified SB8. complete the assigned tasks with minimum supervision SB9. complete the job defined by the supervisor within timelines and quality norms
	Problem Solving and Decision making
	The user/individual on the job needs to know and understand how to: SB10.detect problems in day to day tasks SB11.support supervisor in using specific problem solving techniques and detailing out the problems SB12.discuss possible solution with the supervisor for problem solving SB13.make decisions in emergency conditions in case the supervisor is not available(as per the authority matrix defined by the organization)

ASC/N3609 **Understand processes and equipment requirement for assembly operation of vehicles**

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NOS Code	**ASC/N3609**		
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Occupation	**Assembly**	**Next review date**	**Under revision expected date of revised version 31-dec-15**

National Occupational Standards

Overview

This unit is about preparing the assembling machine, auxiliary apparatus and metal work pieces for the assembling process.

ASC/N3610 **Prepare the machine, auxiliaries and work pieces for vehicle assembly**

National Occupational Standard

Unit Code	ASC/N3610
Unit Title (Task)	**Prepare the machine, auxiliaries and work pieces for vehicle assembly**
Description	This NOS unit is about preparing the surface of the metal parts by removing dust, moistures etc., cleaning the assembling apparatus and installing the metal parts and electrodes on the assembling machine/ assembly block
Scope	The Vehicle Assembly Fitter will be responsible for • arranging the equipment, PPEs and other material required for the process • cleaning and setting up the equipment • escalations of any queries regarding the job The role holder will interact with the Paint shop, Weld shop, maintenance team, vehicle testing team, QA/QC and material management team. The activities will be similar for Body on Frame/ Monocoque assembly
Performance Criteria (PC) w.r.t. the Scope	
Element	**Performance Criteria**
Arrange for equipment, PPE's and other material as per the requirement of the assembling process	PC1. Understand the material required and the equipment availability for executing the activity PC2. Ensure that the required material is procured from the store before starting the assembling process– availability of greases, lubricant oil, adhesives, marking equipment, ID stickers/ labels PC3. Ensure availability of tools required for the assembly process as per the components to be assembled. Tool sizes as mentioned in the Work Instructions/ SOPs for assembly PC4. Ensure that the helper/ assistant technician brings the required material and tools before the start of the assembling operations
Check, clean and setup the assembly equipment	PC5. Setup the assembling apparatus as per the selected assembling process and the internal SOPs/ Work Instructions and the setting standards for the machine PC6. Ensure that the surface of the assembling gun/ Bolting gunis cleaned to remove dust and any other impurities PC7. Ensure that the hoists & cranes for lifting the parts are working in order as per the process requirement

Escalations of queries for the given job	PC8. Immediately refer the queries to the supervisor to avoid any delay in the actual process PC9. Confirm self-understanding to the supervisor/ master technician during the discussions so that all doubts & queries can be resolved before the actual process execution
Knowledge and Understanding (K) w.r.t. the scope	
Element	**Knowledge and Understanding**
A. Organizational Context (Knowledge of the company / organization and its processes)	The user/individual on the job needs to know and understand: KA1. relevant standards and procedures followed in the company KA2. different types of products manufactured by the company KA3. functional processes like Procurement, Store management, inventory management, quality management and key contact points for query resolution
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. different types of assembling processes KB2. different equipment and components used in the assembly process – bolts, nuts, screws, wires, fasteners, connectors, sealants, adhesive bonding equipment, boring drills, Torque testers KB3. different types of bolting guns/ riveting guns used in the assembly process KB4. size for tightening equipment like spanners, screw drivers, testers KB5. the method of reading and interpreting the various gauges KB6. impact of various assembly process like bolting, torqueing, fitting, greasing, hammering, sealing, clamping on the final component/ vehicle performance KB7. how to visualize the final product output and conduct quality verification tests KB8. hazards and safety aspects involved in assembling activities and usage of relevant PPEs
Skills (S) w.r.t. the scope	
Element	**Skills**

ASC/N3610 **Prepare the machine, auxiliaries and work pieces for vehicle assembly**

A. Core Skills/ Generic Skills	**Writing Skills**
	The user/ individual on the job needs to know and understand how to: SA1. document information SA2. note down observations (if any) related to the assembling process SA3. write information documents to internal departments/ internal teams or enter the information in online ERP systems under guidance of the supervisor
	Reading Skills
	The user/individual on the job needs to know and understand how to: SA4. read and interpret technical specifications of the assemble specimen SA5. read equipment manuals and process documents to understand the equipments and processes better SA6. read internal information documents sent by internal teams
	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to: SA7. discuss task lists, schedules and activities with the supervisor SA8. effectively communicate with the team members SA9. question the assembling shop supervisor in order to understand the nature of the problem and to clarify queries SA10. attentively listen with full attention and comprehend the information given by the speaker
B. Professional Skills	**Plan and Organize**
	The user/individual on the job needs to know and understand how to: SB1. plan and organize the work order and jobs received from the Operator SB2. keep fixtures, tools, drawings, Work Instructions, SOP manuals as per the part number, colour codes etc. as defined under the 5S systems SB3. organize all process/ equipment manuals so that sorting/ accessing

	information is easy
	Analytical Thinking
	The user/individual on the job needs to know and understand how to: SB4. visualize the final job product after understanding the given drawing/ sketches/ Work Instruction/ SOP SB5. co relate the type of job output required with the assembling methodology to be used SB6. identify the strengths and weakness of various assembling process
	Judgment and Critical Thinking
	The user/individual on the job needs to know and understand how to: SB7. use common sense and make judgments during day to day basis SB8. use reasoning skills to identify and resolve basic problems
	Desire to learn and take initiatives
	The user/individual on the job needs to know and understand how to: SB9. follow instructions and work on areas of improvement identified and complete the assigned tasks with minimum supervision SB10. complete the job defined by the supervisor within the timelines and quality norms SB11. take initiatives in driving small projects with the supervisor like operation improvement, training of helpers and assistant operators, 5S, Kaizen etc.

ASC/N3610 **Prepare the machine, auxiliaries and work pieces for vehicle assembly**

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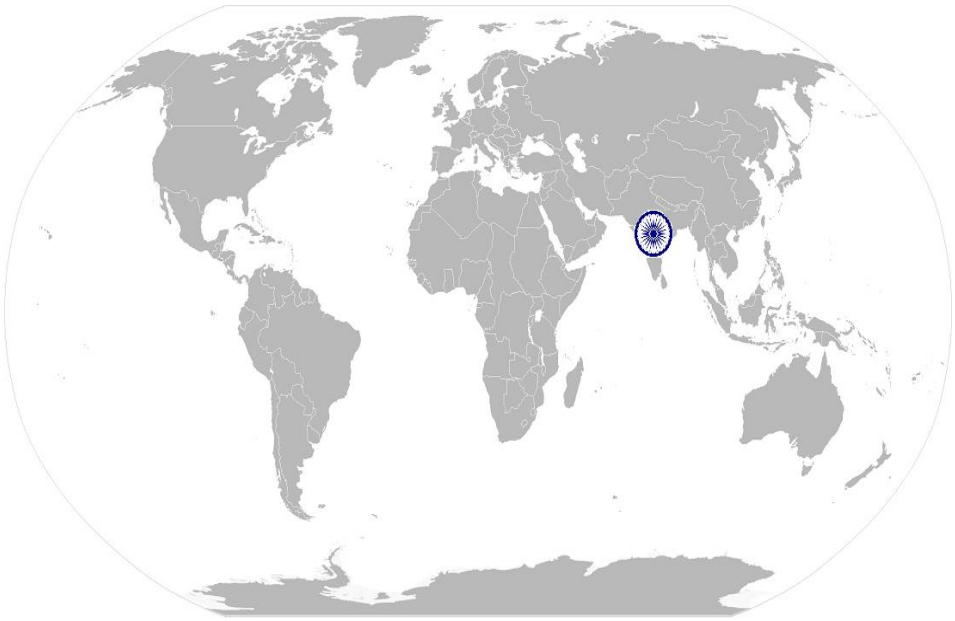
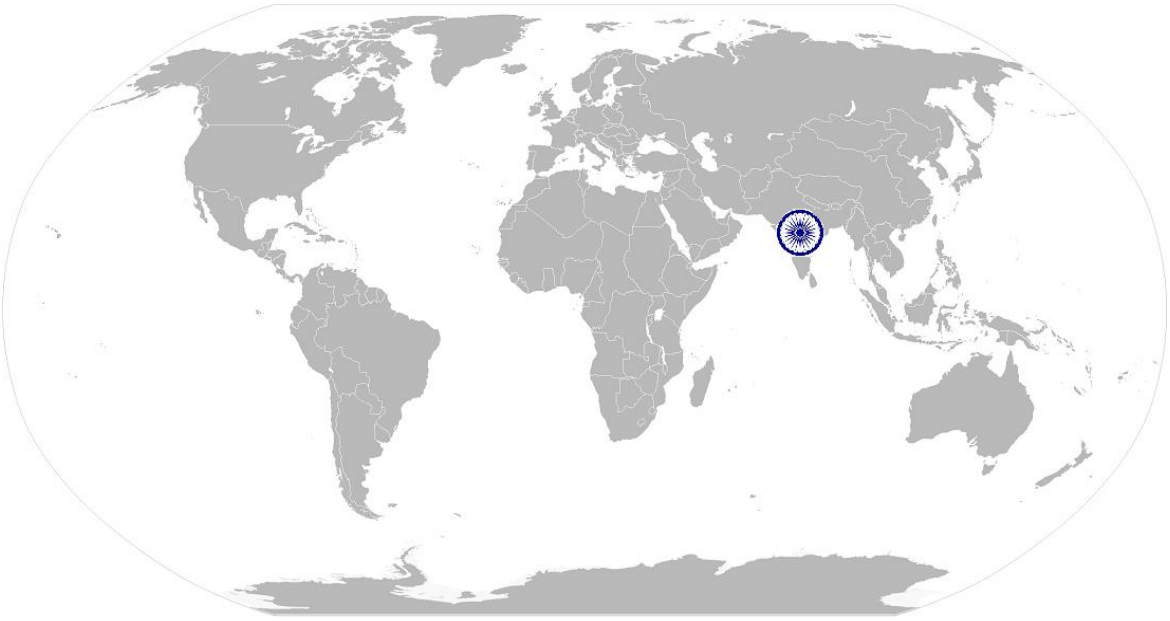
Industry Sub-sector	Manufacturing	Last reviewed on	15/9/2013
Occupation	Assembly	Next review date	Under revision expected date of revised version 31-dec-15



National Occupational Standard



Overview

This unit is about conducting the Mechanical Assembly/Sub Assembly Process for Automotive components and Vehicles

ASC/N3611 **Perform the Mechanical Assembling operation for all mechanical components**

National Occupational Standard

Unit Code	ASC /N3611
Unit Title (Task)	**Perform the Mechanical Assembling operation for all mechanical components**
Description	This NOS is about completing the Body Assembly/Sub Assembly
Scope	The Vehicle Assembly Fitter will be responsible for • reading and interpreting drawing, sketches and work instructions • arranging the parts to be assembled and join the parts using bolting, tightening, riveting, clamping etc. activities • conduction first level inspection and quality checks The role holder will interact with the Paint shop, Weld shop, maintenance team, QA/QC, material management team and vehicle testing team. The activities will be similar for Body on Frame/ Monocoque assembly
Performance Criteria(PC) w.r.t. the Scope	
Element	**Performance Criteria**
Read and interpret the assembly drawing/ blue print/Work Instruction	PC1. Understand the assembly operations from the assembly drawing/ blue print Work Instructions/ SOP supplied on the assembly line PC2. Understand the correct method of the assembly operation such as angle for holding the bolting gun/ riveting gun, direction of applying torque, position of technician hand/ body to complete the assembly operation keeping in mind safe working procedures PC3. Read the specifications manuals and plan assembly or building operations

ASC/N3611 **Perform the Mechanical Assembling operation for all mechanical components**

Arrange the parts to be assembled in the given position	PC4. Ensure drop of sub-assemblies like frame , gear box, axles, car frame, etc. at the respective stations without damaging the components PC5. Correctly Position or align components for assembly, manually or using hoists PC6. Ensure that hoists are used to lift the right material from the conveyors, bins, part trolleys etc. PC7. Ensure part clearances as specified in the Work Instructions/ Standard Operating Processes PC8. Assemble the required parts using pneumatic, hydraulic/ PLC controlled assembly tools PC9. Pick the right fastening part and right tightening tool from the right tray/ kit trolley as identified in the Drawing/ Standard Operating Procedure/ Work Instruction and is correctly placed in the designated slot/ space as indicated in the Work Instructions/ SOP PC10. In case of Robotic assembly line, ensure that the correct details are fed into the system and the right program is selected (corresponding to the component/ vehicle under assembly)
Conduct the Assembly operations for the components	PC11. Carefully insert the right bolts, screw, rivet in the required place in the part of be assembled PC12. Perform tightening of nuts and bolts using bolting guns/ riveting guns as per the required specifications for fitment of each part PC13. Ensure right amount of torque application for tightening the bolted components. PC14. Check the torque values using a torqueing meter and validate the same with the torque chart provided on the assembly station PC15. Ensure all pneumatic and hydraulic components in the vehicles and the relevant auto components are installed using the correct methodology as indicated in the Work Instructions/ SOPs/ Control Plans PC16. Ensure using the right couplers, tee joints, elbow joints, connectors, sleeves, nuts and other connecting and tightening mechanisms to

	assembly the pneumatic/ hydraulic line components like hose pipes, tanks, sockets, glands etc. PC17. Ensure proper installation/ assembly of Oil and Lube systems by placing the funnel, filters, hose pipes,, glands, sockets, suction guns and regulator values and fitting them using couplers, nuts, screws as prescribed in the Work Instructions/ SOPs/ Control Plans PC18. Ensure proper sealing of the required areas to prevent any leakage of water/ air etc. during the usage of the component/ vehicle PC19. Ensure completion of other relevant assembly processes like adjustment, ID Sticker application and minor rework procedures like hammering etc. for the component assembly processed here to the assembly quality norms specified by the organization PC20. Ensure proper lubrication of parts as instructed in the Work Instructions/ SOP PC21. Ensure that the assembly operations are completed as per the specified time and performance levels PC22. Ensure that the fixtures and the assembly equipment is kept back to their respective locations once the process has been completed PC23. Ensure that the tools and fixtures are maintained in the proper locations and are checked as per the checklist provided by the maintenance team PC24. Ensure proper quality checks at each assembly station and validate the conformance to the drawing/ blueprint/ Work Instruction/ SOPs supplied to the assembly station PC25. Ensure that while assembling the components at a particular work station/ platform, care is taken to ensure fitment of the components in the successive stations PC26. Ensure that while assembling the components, the aesthetic properties of the final output like component/ vehicle is maintained PC27. Ensure proper disposal of residual greases, adhesives,

	metal chips and scrap, plastic and paper waste etc. in the designated place as per the Standard Operating Procedure for waste disposal PC28. Ensure proper storage of extra grease, lubrication oil etc. to prevent any contamination through moisture, dust, dirt
Conduct Auxiliary Assembly process	PC29. Ensure insertion of pins, sleeves, bushes, bearings, connectors etc. in the housing as per the Work Instructions/ SOPs mentioned PC30. Ensure orientation, alignment and angle adjustment – value of angle, distance, response to gauges PC31. Ensure tightening of threaded fasteners – torque level of tightening and sequencing of fastening PC32. Ensure sealing of gap areas with rubber or adhesives as per the Work Instructions/ SOPs PC33. Ensure proper lubrication/ greasing/ oiling of components as per the quantity of application mentioned in the Work Instructions/ SOPs
Conduct the fuel filling operation as the fuel station	PC34. Safely conduct the fuel filling operation at the respective station PC35. Ensure that proper safety norms are followed at the time of the Vehicle fuelling
Inspection and Testing of assembled components	PC36. Verify functioning, machine capabilities, or conformance to customer specifications PC37. Complete the Dynamometer , Head lamp focus, shower , wheel Alignment and roll & brake testing
Knowledge and Understanding (K)	
A. Organizational Context (Knowledge of the company / organization and its processes)	The user/individual on the job needs to know and understand: KA1. relevant standards and procedures followed in the company KA2. different types of products manufactured by the company KA3. knowledge of functional processes like store management, inventory management, quality management and key contact points for query resolution

ASC/N3611 **Perform the Mechanical Assembling operation for all mechanical components**

B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. different types of assembling processes and component storage process (Kitting) KB2. different equipment and components used in the assembly process – bolts, nuts, screws, wires, fasteners, connectors, sealants, adhesive bonding equipment etc. (Knowledge of shapes, size and utility) KB3. different types of bolting guns/ riveting guns/ Hand held/ Power drills used in the assembly process KB4. size for tightening equipment like spanners, screw drivers, wrenches, pliers testers KB5. numbering/ identification nomenclature for the various assembly and tightening equipment KB6. the method of reading and interpreting the various gauges, meters, graphs, dials KB7. Reading and interpreting torqueing charts and usage of Torque Meters KB8. impact of various assembly process like bolting, torqueing, tightening, fitting, greasing, hammering, sealing, clamping on the final component/ vehicle performance KB9. different types of defects which may arise due to improper tightening and torqueing KB10. how to visualize the final product output and conduct quality verification tests KB11. how to operate both in automatic and manual mode KB12. available reaction plan for all operational efficiencies as mentioned in the SOP/ Work Instruction/ Control Plan for eventualities of drop in air pressure, power supply discontinuation, key characteristics out of control and any other operational abnormality KB13. hazards and safety aspects involved in assembling activities and usage of relevant PPEs
Skills (S) [Optional]	
A. Core Skills/ Generic Skills	**Writing Skills**

ASC/N3611 **Perform the Mechanical Assembling operation for all mechanical components**

	The user/ individual on the job needs to know and understand how to: SA1. document information
	Reading Skills
	The user/individual on the job needs to know and understand how to: SA2. read equipment manuals and process documents to understand the equipment and processes better SA3. read internal information memos shared by internal customers (other functions within the organization)
	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to: SA4. discuss task lists, schedules, and work-loads with co-workers SA5. question internal customers/ assemble shop supervisor in order to understand the nature of the problem and make a diagnosis
B. Professional Skills	**Plan and Organize**
	The user/individual on the job needs to know and understand: SB1. plan and organize the work order and jobs received from the internal customers SB2. plan and organize the design/ process/quality documents received from internal customers. SB3. keep fixtures, tools, drawings, Work Instructions, SOP manuals as per the part number, colour codes etc. as defined under the 5S systems SB4. organize all process/ equipment manuals so that sorting out information is fast
	Analytical Thinking
	The user/individual on the job needs to know and understand how to: SB5. carefully analyze the body part for various assembling defects at every station SB6. carefully run the production line with relevant actions as listed in SOP/WI if some delay, or power supply problem happens

ASC/N3611 **Perform the Mechanical Assembling operation for all mechanical components**

NOS Version Control

`NOS Code	ASC/N3611		
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Industry	Automotive	Drafted on	5/9/2013
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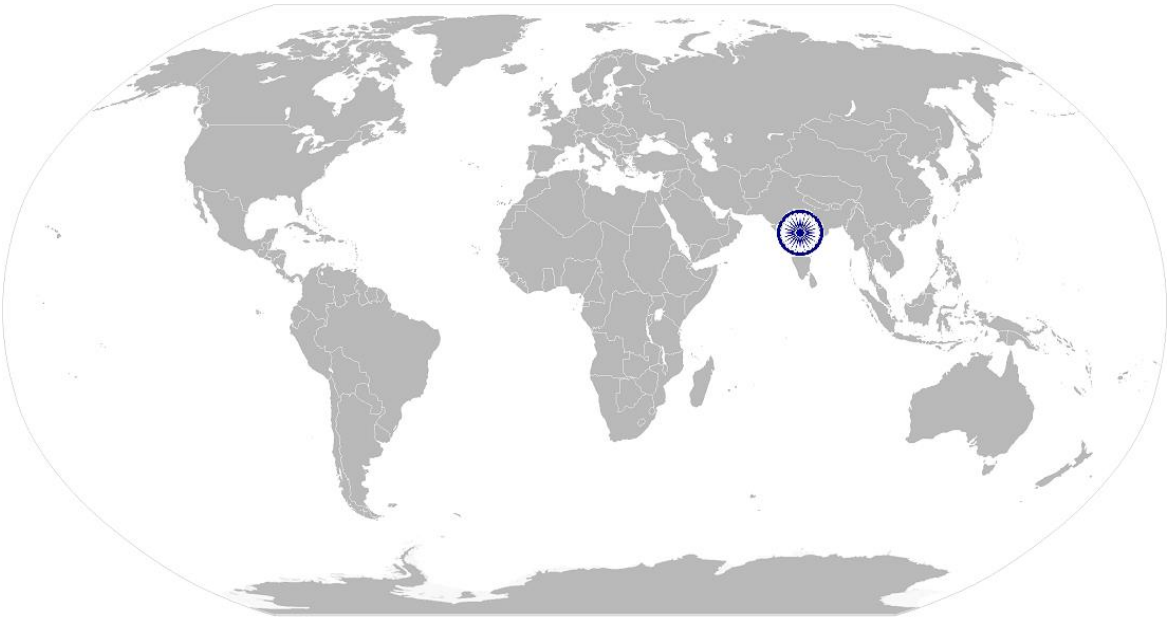
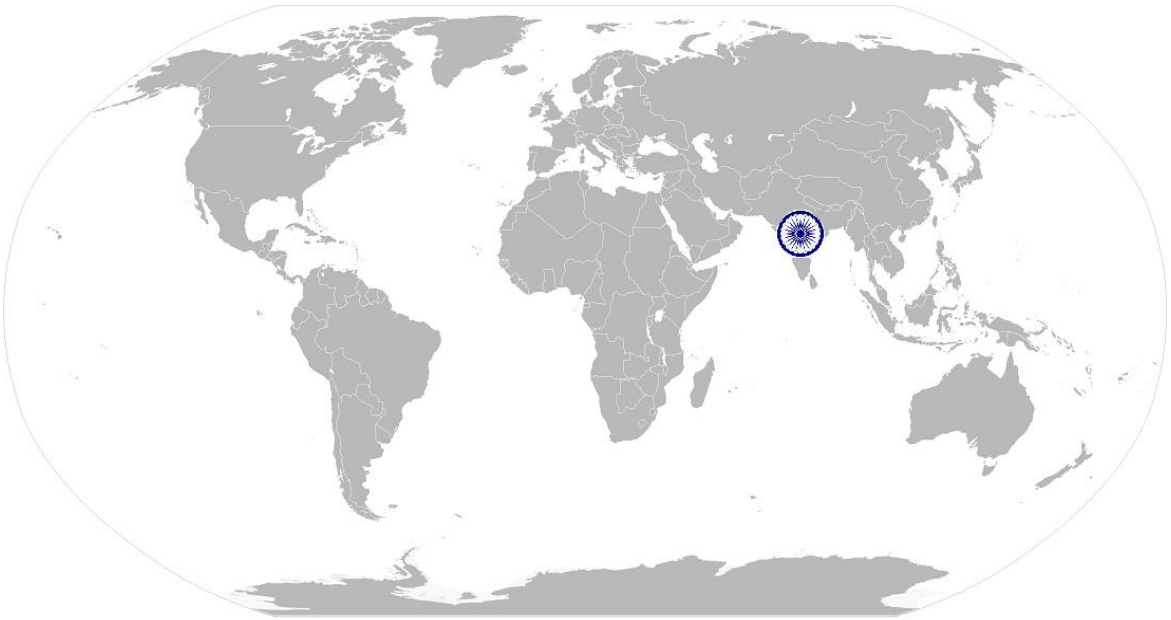


National Occupational Standard



Overview

This unit is about conducting the Electrical Assembly/Sub Assembly Process for Automotive Components and Vehicles

National Occupational Standard

Unit Code	ASC /N3612
Unit Title (Task)	Perform the electrical assembly operation
Description	This NOS is about assembly of electrical equipment in the vehicle
Scope	The Vehicle Assembly Fitter will be responsible for • reading and interpreting drawing, sketches and work instructions • arranging the parts to be assembled and join the parts using bolting, tightening, crimping, clamping etc. activities • conduction first level inspection and quality checks The role holder will interact with the Paint shop, Weld shop, maintenance team, QA/QC, material management team and vehicle testing team. The activities will be similar for Body on Frame/ Monocoque assembly

Performance Criteria(PC) w.r.t. the Scope	
Element	
Read and interpret the assembly drawing/ blue print/Work Instructions	PC1. Understand the assembly operations from the assembly drawing/ blue print / Circuit Diagram/ Work Instructions/ SOPs supplied on the assembly line PC2. Understand the correct method of the assembly operation such as angle for holding the soldering gun, direction of applying torque, position of technician hand/ body to complete the assembly operation keeping in mind safe working procedures PC3. Read the specifications manuals and plan assembly operations
Arrange the parts to be assembled in the given position	PC4. Correctly Position or align components for assembly, manually or using hoists, clamps etc. for holding the electrical parts together on the Jig Board/ Assembly line PC5. Pick the right fastening part (Connectors, terminals, couplers), right tightening tool and the right colored wires from the right tray/ kit trolley as identified in the Drawing/ Standard Operating Procedure/ Work Instructions
Assemble electrical and electronic systems	PC6. Select the correct program from the program module of the CNC operated assembly machine/ cutting machine/ winding machine PC7. Ensure wire cutting as per the required length specified in the work order PC8. Check the wire dimensions using micrometers. Rectify any deviations by changing the machine setting PC9. Select the correct terminals/ connectors/ clips and attach the terminals to the correct wires PC10. Install components, units, wires and subassemblies using screws, fasteners or through joining process like high frequency welding or soldering as per

	the dimensions mentioned in the work instructions/ SOP manual PC11. Ensure proper installation of rubber glands/rubber seals to provide insulation/ prevention of moisture seepage PC12. Ensure proper routing of the wires and the cables as indicated in the Work Instructions, circuit drawing/ Work Instructions/ SOPs provided at each station PC13. Ensure proper crimping of the wire terminals and twisting of wire bunch as specified in the Work Instructions PC14. Remove loops and entanglements and do the tapping operation to ensure hassle free electrical connections PC15. Check the correct orientation of the clip from the circuit diagram PC16. In case of electronic component assembly, ensure selection of components as per the capacity/ rating required for the component PC17. Ensure proper placement of the electronic components on the blank PCB as per the circuit diagram PC18. Solder the components using manual soldering rod/ automatic solder by applying the specified current and temperature and the flux, as specified in the Work Instructions
Conduct Ultrasonic or High Frequency welding	PC19. Ensure correct bundling of the wires and terminals which need to be welded PC20. Place and align the wires as per the work standards PC21. Adjust the wire bundles on the welding block and properly clamp the bundle PC22. Adjust current settings and pass High frequency current through the bundled wires to bond them together PC23. Put insulator/ safety sheaths on the crimped/ welded wires for protection
Inspect or test wiring installations, assemblies, or circuits	PC24. Conduct visual inspection of the bundled electrical and electronics wiring, Circuits and harness PC25. Check for orientation of terminals PC26. Check for correct product number and connections as specified in the Work Instructions PC27. Check for correct Input /output connectors PC28. Test for any short circuit/ open circuit through the lamp glow test PC29. Inspect the wire bundle for length, orientation, path, part fitment and before packing the wire assembly
Knowledge and Understanding (K)	
A. Organizational Context (Knowledge of the company / organization and its processes)	The user/individual on the job needs to know and understand: KA1. relevant standards and procedures followed in the company KA2. different types of products manufactured by the company KA3. knowledge of functional processes like store management, inventory management, quality management and key contact points for query resolution

ASC/N3612 **Perform the electrical assembly operation**

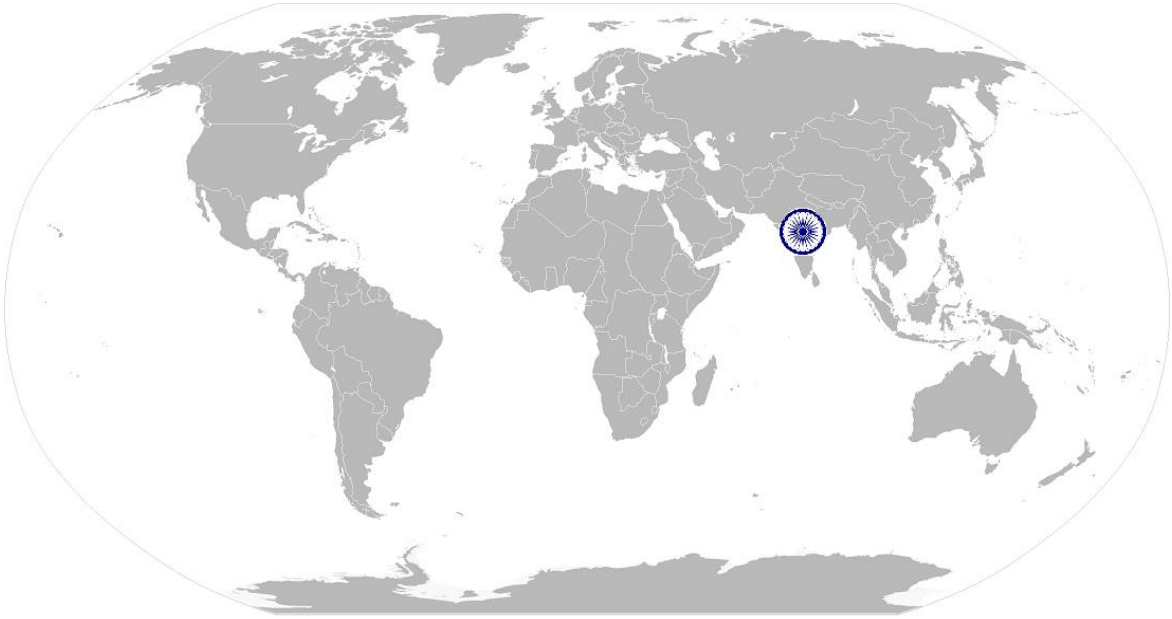
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. different types of colour codes and their meaning for electrical wires KB2. drawing and route/ circuit diagram KB3. electrical/ electronic symbols used on the assembly boards KB4. different tools used during electrical assembly – crimpers, fasteners, twisting pliers, testers, screw drivers, bolts, screws etc. KB5. different types of wire covers, insulators and sheaths to be used KB6. the method of reading and interpreting the various gauges, meters, graphs, dials KB7. computer display and analysis techniques KB8. how to visualize the final product output and hence decide on the key steps to be followed KB9. various inspection techniques used for testing of electrical components KB10. impact of various electrical conditions on the performance of the equipment KB11. available reaction plan for all operational efficiencies as mentioned in the SOP/ Work Instruction/ Control Plan for eventualities of drop in air pressure, power supply discontinuation, key characteristics out of control and any other operational abnormality KB12. various PPEs to be used during electrical assembly operations KB13. mechanisms for disposal of waste material and scrap KB14. occupational hazards associated while working on electrical circuits
Skill (S)[Optional]	
A. Core Skills/ Generic Skills	**Writing Skills**
	The user/ individual on the job needs to know and understand how to: SA1. document information SA2. maintain records of production and defects SA3. draw basic level circuit layouts and connection diagrams
	Reading Skills
	The user/individual on the job needs to know and understand how to: SA4. read equipment manuals and process documents to understand the equipment and processes better SA5. understand electrical and electronic symbols used in the circuits SA6. read internal information memos shared by internal customers (other functions within the organization)
	Oral Communication (Listening and Speaking skills)

	The user/individual on the job needs to know and understand how to: SA7. discuss task lists, schedules, and work-loads with co-workers SA8. question internal customers/ assemble shop supervisor in order to understand the nature of the problem and make a diagnosis
B. Professional Skills	**Plan and Organize**
	The user/individual on the job needs to know and understand: SB1. plan and organize the work order and jobs received from the internal customers SB2. plan and organize the design/ process/quality documents received from internal customers SB3. keep fixtures, tools, drawings, Work Instructions, SOP manuals as per the part number, colour codes etc as defined under the 5S systems SB4. organize all process/ equipment manuals so that sorting out information is fast
	Analytical Thinking
	The user/individual on the job needs to know and understand how to: SB5. carefully analyze the body part for various assembling defects at every station SB6. carefully run the production line with relevant actions as listed in SOP/WI if some delay, or power supply problem happens

NOS Version Control

NOS Code	**ASC/N3612**		
Credits(NSQF)	**TBD**	**Version number**	**1.0**
Industry	**Automotive**	**Drafted on**	**5/9/2013**
Industry Sub-sector	**Manufacturing**	**Last reviewed on**	**15/9/2013**
Occupation	**Assembly**	**Next review date**	**Under revision expected date of revised version 31-dec-15**

National Occupational Standard



Overview

This unit is about conducting inspection and quality checks for completed components and vehicles

ASC/N3613 **Perform the Quality Checks and Inspection of the finished products (Auto Components/ Vehicles)**

National Occupational Standard

Unit Code	ASC /N3613
Unit Title (Task)	Perform the Quality Checks and Inspection of the finished products (Auto Components/ Vehicles)
Description	This NOS is about inspecting the manufactured vehicles for basic level performance attributes and quality assurance
Scope	The Vehicle Assembly Fitter will be responsible for • conducting physical inspection of the automobile • conducting wheel balancing, dynamometer testing, shower testing etc. • conduction first level inspection and quality checks for electrical circuits The role holder will interact with the Paint shop, Weld shop, maintenance team, QA/QC, material management team and vehicle testing team. The activities will be similar for Body on Frame/ Monocoque assembly
Performance Criteria(PC) w.r.t. the Scope	
Element	**Performance Criteria**
Conduct Physical inspection of the manufactured Automobile	PC1. Ensure full inspection of the physical body of the Auto Component/ Automobile to detect any quality related defects related to body surface, paint, dents, grooves, cracks, rough edges etc. PC2. Ensure inspection of the specimen in proper lighting so that detection of errors is fast and accurate PC3. Ensure inspection of all major components of the automobile including body surface, doors, tyres, wheels, wind shield, internal seating, dashboard etc. PC4. Ensure part clearances as specified in the Work Instructions/ Standard Operating Processes PC5. Mark all the observed physical detects using a chalk stick or any other erasable substance to identify the potential rework areas which can be immediately addressed to
Conduct Wheel Balancing and Dynamometer test on the Automobiles	PC6. Ensure that every manufactured vehicle is rolled up to the dynamometer testing area to test the torque, Horsepower, speed, roll speed and heat load PC7. Ensure that the connections for the test vehicle are properly applied to the test bench PC8. Ensure that the vehicle is accelerated to the desired limits as indicated in the Test station chart and Standard Operating Procedures PC9. Observe the control panel and display of the dynamometer and record the readings in the given formats PC10. Ensure that the vehicle is properly mount on the wheel balancing machine to test vibration of the wheels and tires. PC11. Conduct the test and record any observations on wheeling wobbling, vibrations and any other type of disturbances PC12. Ensure run out for all radial tyres as per the standards laid down in the Work

	Instructions/ SOPs/ Control Plan PC13. Ensure correct observations of all performance testing charts and graphs to note the performance characteristics and related reading and test values/ outcome PC14. Ensure that the errors are tagged/ marked immediately so that they can be rectified at the earliest and the vehicle can be prepared for dispatch PC15. Ensure that all the errors observed are noted in the log books as per the format shared with the operators
Conduct inspection of key electrical and electronic components	PC16. Ensure the working of the lighting systems and the headlamp focus by turning on the internal cabin lights and headlamps and checking the working of lighting circuit and headlamps focus PC17. Check the working of the key vehicle dashboard indicators by turning on the engine PC18. Ensure that the horn and Indicator system are working by turning on the respective systems and checking the horn and indicator circuit
Conduct Shower test on the Automobiles	PC19. Ensure that every Automobile manufactured undergoes a shower test for testing water leakages in the vehicle PC20. Ensure that all shower nozzles, water supply pipes, water circulation motor and the blower are in order PC21. Ensure that all doors and windows are tightly closed when the automobile enters the Shower testing area PC22. Ensure that the correct parameters on water pressure, water spray angles and test time are followed during the test PC23. Monitor the flow of water and detect any leakages happening through wind shield, tailgate shield, windows and door frame/ rubber padding on doors & windows PC24. Ensure that the errors are informed to the supervisor immediately so that they can be rectified and the vehicle can be prepared for dispatch
Test key components like brakes, shock absorbers	PC25. Conduct testing for components like brakes, shock absorbers etc. and observe the performance values on parameters like loading, resistance etc. PC26. Ensure the tests meets the required performance levels as indicated in the Work Instructions/ SOP manuals
Conduct final assembly inspection	PC27. Clean the automobile after the shower test and make it ready for dispatch. Use manual cleaning methods, component washer, air pressure as per application PC28. Check the availability of all the Vehicle manuals and the relevant manufacturing papers in the Automobile for the customer
Knowledge and Understanding (K)	
A. Organizational Context (Knowledge of the company /	The user/individual on the job needs to know and understand: KA1. relevant standards and procedures followed in the company KA2. different types of products manufactured by the company KA3. knowledge of functional processes like store management, inventory

organization and its processes)	management, quality management and key contact points for query resolution
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. different types of assembling processes KB2. different equipment and components used in the assembly process – bolts, nuts, screws, wires, fasteners, connectors, sealants, adhesive bonding equipment etc. (Knowledge of shapes, size and utility) KB3. numbering/ identification nomenclature for the various assembly and tightening equipment KB4. methods of conducting online inspection of the products using meters, gauges, control tools KB5. methods for checking the calibration of the inspection tools and mechanisms to handle various measurement errors KB6. the method of reading and interpreting the various gauges KB7. impact of various assembly process like bolting, torqueing, tightening, fitting, greasing, hammering, sealing, clamping on the final component/ vehicle performance KB8. different types of defects which may arise due to improper tightening and torqueing KB9. various testing procedures for components and automobiles KB10. hazards and safety aspects involved in assembling activities and usage of relevant PPEs
Skills (S) [Optional]	
A. Core Skills/ Generic Skills	**Writing Skills**
	The user/ individual on the job needs to know and understand how to: SA1. document information SA2. note down observations and reading during vehicle testing/ component testing
	Reading Skills
	The user/individual on the job needs to know and understand how to: SA3. read equipment manuals and process documents to understand the equipment and processes better SA4. read internal information memos shared by internal customers (other functions within the organization)
	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to: SA5. discuss task lists, schedules, and work-loads with co-workers SA6. question internal customers/ assemble shop supervisor in order to understand the nature of the problem and make a diagnosis
B. Professional Skills	**Plan and Organize**

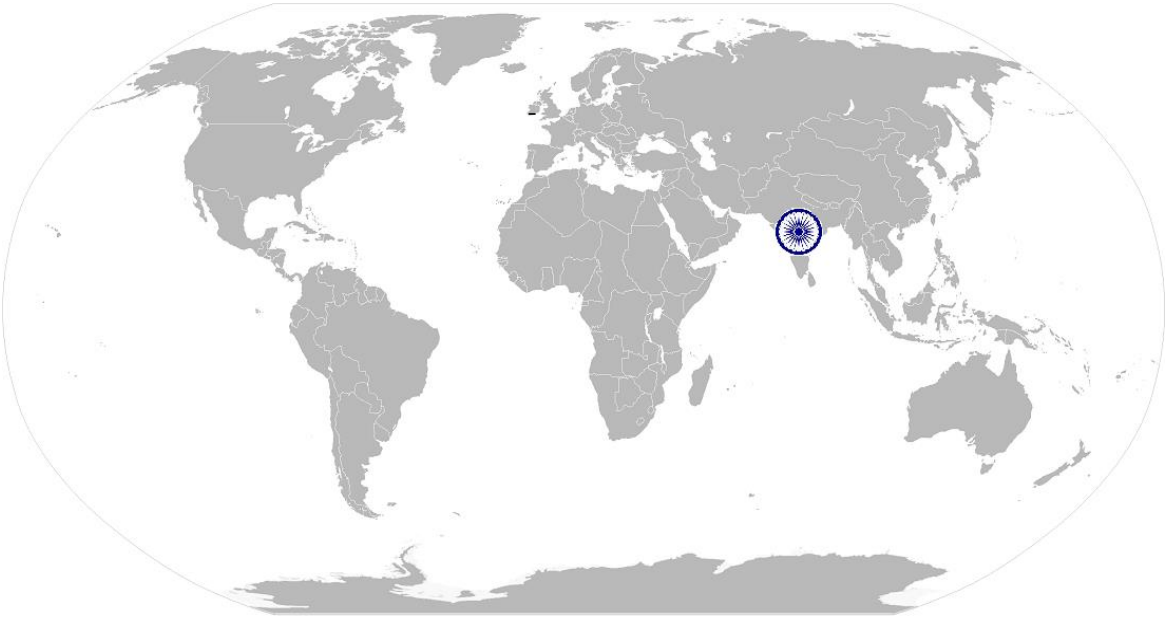
ASC/N3613 **Perform the Quality Checks and Inspection of the finished products (Auto Components/ Vehicles)**

	The user/individual on the job needs to know and understand: SB1. plan and organize the work order and jobs received from the internal customers SB2. plan and organize the design/ process/quality documents received from internal customers SB3. keep fixtures, tools, drawings, Work Instructions, SOP manuals as per the part number, colour codes etc. as defined under the 5S systems SB4. organize all process/ equipment manuals so that sorting out information is fast
	Analytical Thinking
	The user/individual on the job needs to know and understand how to: SB5. carefully analyze the body part for various assembling defects at every station SB6. carefully analyse each defect observed during inspection and try to find solution for the defect along with the assembly line operator
	Quality Consciousness
	The user/individual on the job needs to know and understand how to: SB7. identify defective parts in the manufacturing line by comparing manufactured pieces with the work standard SB8. link the defect observed with the overall impact on the performance of the component/ automobile

NOS Version Control

NOS Code	**ASC/N3613**		
Credits(NSQF)	**TBD**	**Version number**	**1.0**
Industry	**Automotive**	**Drafted on**	**5/9/2013**
Industry Sub-sector	**Manufacturing**	**Last reviewed on**	**15/9/2013**
Occupation	**Assembly**	**Next review date**	**Under revision expected date of revised version 31-dec-15**

National Occupational Standard



Overview

This unit is about maintaining a Safe and Healthy working environment

National Occupational Standard

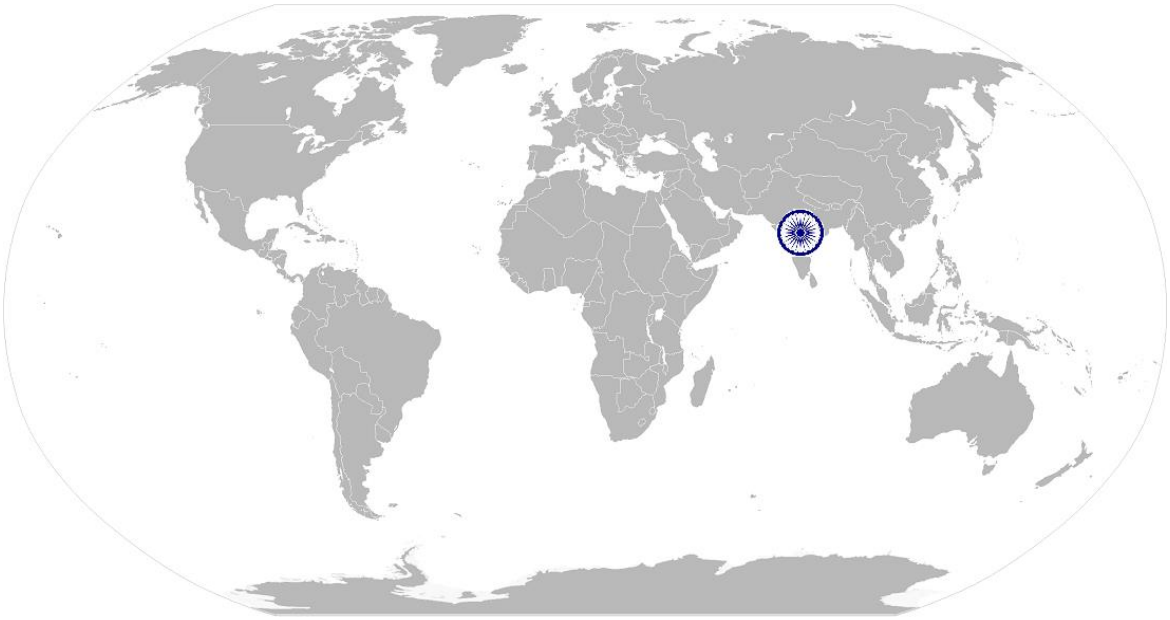
Unit Code	ASC/N0006
Unit Title (Task)	**Maintain a safe and healthy working environment**
Description	This NOS unit is about creating a Safe and Healthy work place, adhering to the safety guidelines in the working area, following practices which are not impacting the environment in a negative manner
Scope	The role holder will be responsible for • identifying and reporting of risks • creating and sustaining a safe, clean and environment friendly work place This NOS will be applicable to all Automotive sector manufacturing job roles
Performance Criteria (PC) w.r.t. the Scope	
Element	**Performance Criteria**
Identify and report the risks identified	PC1. Identify activities which can cause potential injury through sharp objects, burns, fall, electricity, gas leakages, radiation, poisonous fumes, chemicals ,loud noise PC2. Identify areas in the plant which are potentially hazardous/ unhygienic in nature PC3. Conduct regular checks on machine health to identify potential hazards due to wear and tear of machine PC4. Inform the concerned authorities about the potential risks identified in the processes, workplace area/ layout, materials used etc. PC5. Inform the concerned authorities about machine breakdowns, damages which can potentially harm man/ machine during operations PC6. Create awareness amongst other by sharing information on the identified risks
Create and sustain a Safe, clean and environment friendly work place	PC7. Support the Safety team and the supervisor in creating the risk mitigation plan PC8. Follow the instructions given on the equipment manual describing the operating process of the equipment PC9. Follow the Safety, Health and Environment related practices developed by the organization PC10. Operate the machine using the recommended Personal Protective Equipment (PPE) and ensure team members also use the related PPEs at the workplace PC11. Maintain a clean and safe working environment near the work place and ensure there is no spillage of chemicals, production waste, oil, solvents etc. PC12. Attend all safety and fire drills to be self- aware of safety hazards

	and preventive techniques PC13. Maintain high standards of personal hygiene at the work place PC14. Ensure that the waste disposal is done in the designated area and manner as per organization SOP. PC15. Inform the medical officer/ HR in case of self or an employee's illness of contagious nature so that preventive actions can be planned for others
Knowledge and Understanding (K)w.r.t. the scope	
Element	**Knowledge and Understanding**
A. Organizational Context (Knowledge of the company / organization and its processes)	The user/individual on the job needs to know and understand: KA1. relevant standards, procedures and policies related to Health, Safety and Environment followed in the company KA2. emergency handling procedures & hierarchy for escalation
B. Technical Knowledge	The user/individual on the job needs to know and understand: KB1. basic knowledge of Safety procedures(fire fighting, first aid) within the organization KB2. basic knowledge of various types of PPEs and their usage KB3. basic knowledge of risks/hazards associated with each occupation in the organization KB4. knowledge of personal hygiene and how an individual an contribute towards creating a highly safe and clean working environment
Skills (S)w.r.t. the scope	
Element	**Skills**
A. Core Skills/ Generic Skills	**Writing Skills**
	The user/ individual on the job needs to know and understand how to: SA1. write basic level notes and observations
	Reading Skills
	The user/individual on the job needs to know and understand how to: SA2. read safety instructions put up across the plant premises SA3. read safety precautions mentioned in equipment manuals and panels to understand the potential risks associated
	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to: SA4. effectively communicate information to team members SA5. Inform employees in the plant and concerned functions about events, incidents & potential risks observed related to Safety, Health and Environment. SA6. question operator/ supervisor in order to understand the safety related issues SA7. attentively listen with full attention and comprehend the information given by the speaker during safety drills and training

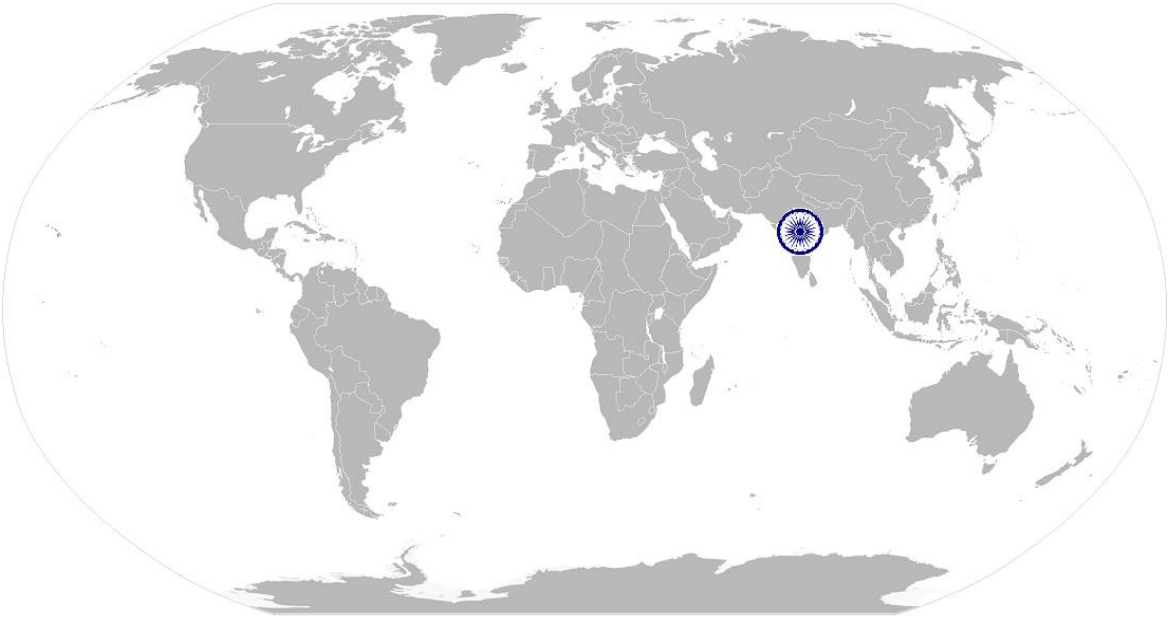
	programs
B. Professional Skills	**Judgmental Thinking**
	The user/individual on the job needs to know and understand how to: SB1. use common sense and make judgments during day to day basis SB2. use reasoning skills to identify and resolve basic problems

NOS Version Control

NOS Code	**ASC/N0006**		
Credits(NSQF)	**TBD**	**Version number**	**1.0**
Industry	**Automotive**	**Drafted on**	**15/8/2013**
Industry Sub-sector	**Manufacturing**	**Last reviewed on**	**25/8/2013**
Occupation	**Assembly**	**Next review date**	**Under revision expected date of revised version 31-dec-15**



National Occupational Standard



Overview

This unit is about the understanding all principles of 5S and follow the given guidelines to ensure a clean and efficient working environment in the organization

ASC/N0021 **Maintain 5S at the work premises**

National Occupational Standard

Unit Code	ASC/N0021
Unit Title (Task)	**Maintain 5S at the work premises**
Description	This NOS is about ensuring all 5 S activities both at the shop floor and the office area to facilitate increase in work productivity
Scope	The individual needs to • Ensure sorting, streamlining & organizing, storage and documentation, cleaning, standardization and sustenance across the plant and office premises of the organization
Performance Criteria (PC) w.r.t. the Scope	
Element	**Performance Criteria**
Ensure sorting	PC1. Follow the sorting process and check that the tools, fixtures & jigs that are lying on workstations are the ones in use and un-necessary items are not cluttering the workbenches or work surfaces. PC2. Ensure segregation of waste in hazardous/ non Hazardous waste as per the sorting work instructions PC3. Follow the technique of waste disposal and waste storage in the proper bins as per SOP PC4. Segregate the items which are labelled as red tag items for the process area and keep them in the correct places PC5. Sort the tools/ equipment/ fasteners/ spare parts as per specifications/ utility into proper trays, cabinets, lockers as mentioned in the 5S guidelines/ work instructions PC6. Ensure that areas of material storage areas are not overflowing PC7. Properly stack the various types of boxes and containers as per the size/ utility to avoid any fall of items/ breakage and also enable easy sorting when required PC8. Return the extra material and tools to the designated sections and make sure that no additional material/ tool is lying near the work area PC9. Follow the floor markings/ area markings used for demarcating the various sections in the plant as per the prescribed instructions and standards
Ensure proper documentation and storage (organizing , streamlining)	PC10. Follow the proper labeling mechanism of instruments/ boxes/ containers and maintaining reference files/ documents with the codes and the lists PC11. Check that the items in the respective areas have been identified as broken or damaged PC12. Follow the given instructions and check for labelling of fluids, oils. lubricants, solvents, chemicals etc. and proper storage of the same

	to avoid spillage, leakage, fire etc. PC13. Make sure that all material and tools are stored in the designated places and in the manner indicated in the 5S instructions
Ensure cleaning of self and the work place	PC14. Check whether safety glasses are clean and in good condition PC15. Keep all outside surfaces of recycling containers are clean PC16. Ensure that the area has floors swept, machinery clean and generally clean. In case of cleaning, ensure that proper displays are maintained on the floor which indicate potential safety hazards PC17. Check whether all hoses, cabling & wires are clean, in good condition and clamped to avoid any mishap or mix up PC18. Ensure workbenches and work surfaces are clean and in good condition PC19. Follow the cleaning schedule for the lighting system to ensure proper illumination PC20. Store the cleaning material and equipment in the correct location and in good condition PC21. Ensure self-cleanliness - clean uniform, clean shoes, clean gloves, clean helmets, personal hygiene
Ensure sustenance	PC1. Follow the daily cleaning standards and schedules to create a clean working environment PC2. Attend all training programs for employees on 5 S PC3. Support the team during the audit of 5 S PC4. Participate actively in employee work groups on 5S and encourage team members for active participation PC5. Follow the guidelines for What to do and What not to do to build sustainability in 5S as mentioned in the 5S check lists/ work instructions
Knowledge and Understanding (K) w.r.t. the scope	
Element	**Knowledge and Understanding**
C. Organizational Context (Knowledge of the company / organization and its processes)	The user/individual on the job needs to know and understand: KA3. relevant standards, procedures and policies related to 5S followed in the company
D. Technical Knowledge	The user/individual on the job needs to : KB5. have basic knowledge of 5S procedures KB6. know various types 5s practices followed in various areas KB7. understand the 5S checklists provided in the department/ team KB8. have skills to identify useful & non useful items KB9. have knowledge of labels , signs & colours used as indicators KB10. Have knowledge on how to sort and store various types of tools, equipment, material etc. KB11. know , how to identify various types of waste products

	KB12. understand the impact of waste/ dirt/ dust/unwanted substances on the process/ environment/ machinery/ human body KB13. have knowledge of best ways of cleaning & waste disposal KB14. understand the importance of standardization in processes KB15. understand the importance of sustainability in 5S KB16. have knowledge of TQM process KB17. have knowledge of various materials and storage norms KB18. understand visual controls, symbols, graphs etc.
Skills (S)w.r.t. the scope	
Element	**Skills**
A. Core Skills/ Generic Skills	**Writing Skills**
	The user/ individual on the job needs to know and understand how to: SA8. write basic level notes and observations SA9. note down observations (if any) related to the process SA10. write information documents to internal departments/ internal teams
	Reading Skills
	The user/individual on the job needs to know and understand how to: SA11. read 5S instructions put up across the plant premises
	Oral Communication (Listening and Speaking skills)
	The user/individual on the job needs to know and understand how to: SA12. effectively communicate information to team members inform employees in the plant and concerned functions about 5S SA13. question the process head in order to understand the 5S related issues SA14. attentively listen with full attention and comprehend the information given by the speaker during 5S training programs
B. Professional Skills	**Judgmental Thinking**
	The user/individual on the job needs to know and understand how to: SB3. use common sense and make judgments during day to day basis SB4. use reasoning skills to identify and resolve basic problems using 5S
	Persuasion
	The user/ individual on the jobs needs to know and understand how to: SB5. persuade co team members to follow 5 S SB6. ensure that the co team members understand the importance of using 5 S tool
	Creativity

ASC/N0021 **Maintain 5S at the work premises**

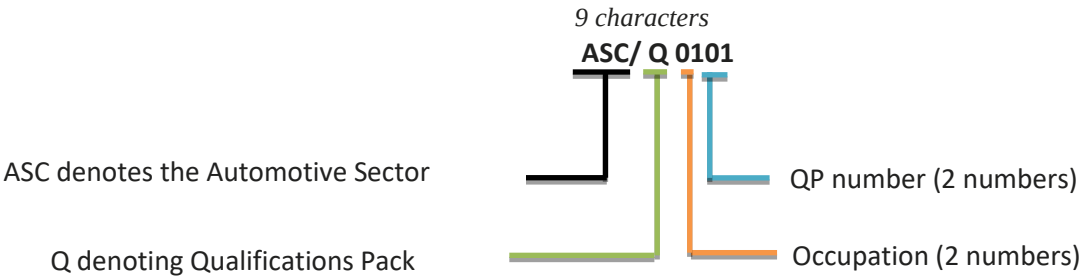
	The user/individual on the job needs to know and understand how to : SB7. use innovative skills to perform and manage 5 S activities at the work desk and the shop floor SB8. exhibit inquisitive behaviour to seek feedback and question on the existing set patterns of work
	Self –Discipline
	The user/individual on the job needs to know and understand how to: SB9. do what is right, not what is a popular practices SB10. follow shop floor rules& regulations and avoid deviations; make 5S an integral way of life SB11. ensure self-cleanliness on a daily basis SB12. demonstrate the will to keep the work area in a clean and orderly manner

NOS Version Control

NOS Code	**ASC/N0021**		
Credits(NSQF)	**TBD**	**Version number**	**1.0**
Industry	**Automotive**	**Drafted on**	**1/03/2014**
Industry Sub-sector	**Manufacturing/ R&D**	**Last reviewed on**	**15/03/2014**
Occupation	**Assembly**	**Next review date**	**Under revision expected date of revised version 31-dec-15**

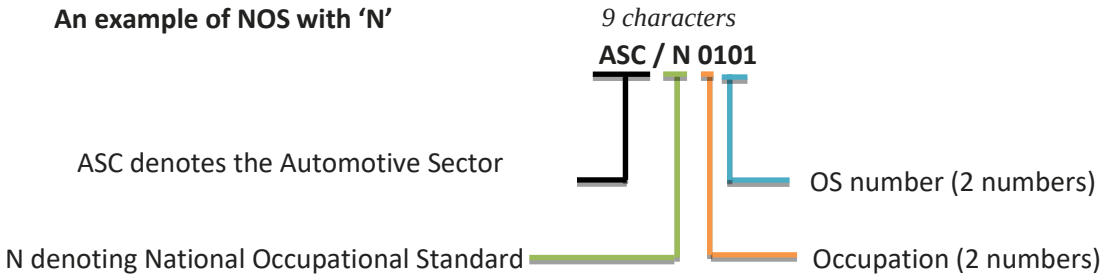
Annexure

Qualifications Pack



Occupational Standard

An example of NOS with 'N'



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The following acronyms/ codes have been used in the nomenclature above:

Sub-sector	Range of Occupation numbers
Manufacturing	**31 - 45 & 61 - 68**
Research & Development	**81 - 84**
Sales & Service	**01 - 21**
Road Transportation	**96 - 97**

Sequence	Description	Example
Three letters	Automotive	ASC
Slash	/	/
Next letter	Whether **Q**P or **N**OS	N
Next two numbers	Occupation code	10
Next two numbers	OS number	12

Criteria for assessment of Trainees

JOB ROLE	VEHICLE ASSESMLY FITTER L4
Qualification Pack	ASC/Q 3601
No. Of NOS	4 Role specific , 2 generic

Sr. No.	Guidelines for Assessment
1	Assessment to be conducted by ASDC as per competency output defined in the NOS/QP and the assessment criteria provided in the NOS/QP
2	Assessment to be carried out by a third party Assessment Body duly affiliated to the SS C.
3	ASDC assessments will be comprehensive and cover all aspects of acquired knowledge, practical skills and also basic ability to communicate. Accordingly, evaluation process would include: i. Theory/Knowledge test ii. Practical demonstration test iii. Face to Face Viva-Voice
4	Theory/Knowledge assessment will be carried out on line through a link provided for each assessment that generates a random paper from a bank of questions available at the back end. • Exception to an online test in favour of Paper Test would be subject to non-availability of requisite broad band and/or hardware. • On line test would be conducted in the presence of an ASDC assessor till web enabled proctoring is deployed.
5	ASDC assessor would be conducting Practical and Viva as per the criteria provided in th e NOS/QP.
6	Cut off criteria for certification (Marks obtained in: 70%)

Assessable Outcome	Assessment Criteria	Total Mark	Out of	Marks allocation	
				Theory	Practical
1. ASC/N3609 Understand processes and equipment requirement to complete the task	PC1. Understand the right assembling methodology and process (Bolting, tightening, riveting, fastening, adhesive clamping, crimping etc.) using mechanical, pneumatic, hydraulic means to be adopted for completing the work order through discussions with the supervisor/ master technician and reading the process manuals/ Work Instructions/ Standard Operating Procedures	100	10	3	7
	PC2. Understand the various assembling		10	3	7

	process parameters like cycle time, pressure, torque etc. before starting the assembling process, as mentioned in the Work Instructions/ SOP manual				
	PC3. Understand the material required and the equipment availability for executing the activity		10	3	7
	PC4. Understand the type of nut runners and torqueing equipment required to be used for the assembling process		10	3	7
	PC5. Understand the various nuts, bolts, rivets, fasteners, covering sheaths etc. kept in the various side trays (Assembly kits)		10	3	7
	PC6. Understand 5S and Safety related aspects related to the work station, assembly Line		10	3	7
	PC7. Clearly understanding the does and don'ts of the manufacturing process as defined in SOPs/ Work Instructions or defined by supervisors		10	3	7
	PC8. Refer the queries to a competent internal specialist if they cannot be resolved by the assembler on own		10	3	7
	PC9. Obtain help or advice from specialist if the problem is outside his/her area of competence or experience		10	3	7
	PC10. Confirm self -understanding with the specialist holding discussions so that all doubts & queries can be resolved before the actual process execution		10	3	7
	Total		**100**	**30**	**70**
2. ASC/N3610 Preparing the assembling machine, auxiliary apparatus and metal work pieces for the assembling process	PC1. Understand the material required and the equipment availability for executing the activity	100	10	3	7
	PC2. Ensure that the required material is procured from the store before starting the assembling process– availability of greases, lubricant oil, adhesives, marking equipment, ID stickers/ labels		11	3	8
	PC3. Ensure availability of tools required for the assembly process as per the components to be assembled. Tool sizes as mentioned in the Work Instructions/ SOPs for assembly		12	4	8
	PC4. Ensure that the helper/ assistant technician brings the required material and tools before the start of the assembling operations		11	3	8
	PC5. Setup the assembling apparatus as per the		12	4	8

	selected assembling process and the internal SOPs/ Work Instructions and the setting standards for the machine.				
	PC6. Ensure that the surface of the assembling gun/ Bolting gun is cleaned to remove dust and any other impurities		11	3	8
	PC7. Ensure that the hoists & cranes for lifting the parts are working in order as per the process requirement		12	4	8
	PC8. Immediately refer the queries to the supervisor to avoid any delay in the actual process		11	3	8
	PC9. Confirm self-understanding to the supervisor/ master technician during the discussions so that all doubts & queries can be resolved before the actual process execution		10	3	7
	Total		**100**	**30**	**70**
3. ASC/N3611 Performing the mechanical assembling operation for all mechanical components	PC1. Understand the assembly operations from the assembly drawing/ blue print Work Instructions/ SOPs supplied on the assembly line	150	3	1	2
	PC2. Understand the correct method of the assembly operation such as angle for holding the bolting gun/ riveting gun, direction of applying torque, position of technician hand/ body to complete the assembly operation keeping in mind safe working procedures		4	1	3
	PC3. Ensure drop of sub-assemblies like frame, base, tubes, pipes, channels . at the respective stations without damaging the components in case		4	1	3
	PC4. Correctly Position or align components for assembly, manually or using hoists		4	1	3
	PC5. Ensure that hoists are used to lift the right material from the conveyors, bins, part trolleys etc.		4	1	3
	PC6. Ensure part clearances as specified in the Work Instructions/ Standard Operating Processes		4	1	3
	PC7. Assemble the required parts using pneumatic, hydraulic/ PLC controlled assembly tools		4	1	3
	PC8. Pick the right fastening part and right tightening tool from the right tray/ kit trolley as identified in the Drawing/ Standard Operating Procedure/ Work Instruction and is correctly placed in the		4	1	3

	designated slot/ space as indicated in the Work Instructions/ SOP				
	PC9. In case of Robotic assembly line, ensure that the correct details are fed into the system and the right program is selected (corresponding to the component/ vehicle under assembly)		4	1	3
	PC10. Carefully insert the right bolts, screw, rivet in the required place in the part of be assembled		4	1	3
	PC11. Perform tightening of nuts and bolts using bolting guns/ riveting guns as per the required specifications for fitment of each part		5	2	3
	PC12. Ensure right amount of torque application for tightening the bolted components.		5	2	3
	PC13. Check the torque values using a torqueing meter and validate the same with the torque chart provided on the assembly station		4	1	3
	PC14. Ensure all pneumatic and hydraulic components in the vehicles and the relevant auto components are installed using the correct methodology as indicated in the Work Instructions/ SOPs/ Control Plans		5	2	3
	PC15. Ensure using the right couplers, tee joints, elbow joints, connectors, sleeves, nuts and other connecting and tightening mechanisms to assembly the pneumatic/hydraulic line components like hose pipes, tanks, sockets, glands etc.		5	2	3
	PC16. Ensure proper installation/ assembly of Oil and Lube systems by placing the funnel, filters, hose pipes, glands, sockets, suction guns and regulator values and fitting them using couplers, nuts, screws as prescribed in the Work Instructions/ SOPs/ Control Plans		4	1	3
	PC17. Ensure proper sealing of the required areas to prevent any leakage of water/ air etc. during the usage of the component/ vehicle		4	1	3
	PC18. Ensure completion of other relevant assembly processes like adjustment, ID Sticker application and minor rework procedures like hammering etc. for the component assembly process adhere to the assembly quality norms specified by		5	2	3

	the organization				
	PC19. Ensure proper lubrication of parts as instructed in the Work Instructions/ SOP		5	2	3
	PC20. Ensure that the assembly operations are completed as per the specified time and performance levels		5	2	3
	PC21. Ensure that the fixtures and the assembly equipment is kept back to their respective locations once the process has been completed		4	1	3
	PC22. Ensure that the tools and fixtures are maintained in the proper locations and are checked as per the checklist provided by the maintenance team		5	2	3
	PC23. Ensure proper quality checks at each assembly station and validate the conformance to the drawing/ blueprint/ Work Instruction/ SOPs supplied to the assembly station		5	2	3
	PC24. Ensure that while assembling the components at a particular work station/ platform, care is taken to ensure fitment of the components in the successive stations		4	1	3
	PC25. Ensure that while assembling the components, the aesthetic properties of the final output like component is maintained		4	1	3
	PC26. Ensure proper disposal of residual greases, adhesives, metal chips and scrap, plastic and paper waste etc. in the designated place as per the Standard Operating Procedure for waste disposal		4	1	3
	PC27. Ensure proper storage of extra grease, lubrication oil etc. to prevent any contamination through moisture, dust, dirt		4	1	3
	PC28. Ensure insertion of pins, sleeves, bushes, bearings, connectors etc. in the housing as per the Work Instructions/ SOPs mentioned		4	1	3
	PC29. Ensure orientation, alignment and angle adjustment – value of angle, distance, response to gauges		4	1	3
	PC30. Ensure tightening of threaded fasteners – torque level of tightening and sequencing of fastening		4	1	3
	PC31. Ensure sealing of gap areas with rubber or adhesives as per the Work Instructions/ SOPs		4	1	3

	PC32. Ensure proper lubrication/ greasing/ oiling of components as per the quantity of application mentioned in the Work Instructions/ SOPs		4	1	3
	PC33. Safely conduct the fuel filling operation at the respective station		4	1	3
	PC34. Ensure that proper safety norms are followed at the time of the Vehicle fuelling		4	1	3
	PC35. Verify functioning, machine capabilities, or conformance to customer specifications		3	1	2
	PC36. Complete the Dynamometer, Head lamp focus, shower, wheel alignment and roll & brake testing		3	1	2
	Total		**150**	**45**	**105**
4. ASC/N3612 Performing the electrical assembling operation	PC1. Understand the assembly operations from the assembly drawing/ blue print / Circuit Diagram/ Work Instructions/ SOPs supplied on the assembly line	100	3	1	2
	PC2. Understand the correct method of the assembly operation such as angle for holding the soldering gun, direction of applying torque, position of technician hand/ body to complete the assembly operation keeping in mind safe working procedures		3	1	2
	PC3. Read the specifications manuals and plan assembly operations		3	1	2
	PC4. Correctly position or align components for assembly, manually or using hoists, clamps etc. for holding the electrical parts together on the Jig Board/ Assembly line		3	1	2
	PC5. Pick the right fastening part (Connectors, terminals, couplers), right tightening tool and the right colored wires from the right tray/ kit trolley as identified in the Drawing/ Standard Operating Procedure/ Work Instructions		3	1	2
	PC6. Select the correct program from the program module of the CNC operated assembly machine/ cutting machine/ winding machine		4	1	3
	PC7. Ensure wire cutting as per the required length specified in the work order		4	1	3
	PC8. Check the wire dimensions using micrometers. Rectify any deviations by changing the machine setting		4	1	3
	PC9. Select the correct terminals/ connectors/ clips and attach the terminals to the		5	2	3

	correct wires				
	PC10. Install components, units, wires and subassemblies using screws, fasteners or through joining process like high frequency welding or soldering as per the dimensions mentioned in the work instructions/ SOP manual		4	1	3
	PC11. Ensure proper installation of rubber glands/ rubber seals to provide insulation/ prevention of moisture seepage		3	1	2
	PC12. Ensure proper routing of the wires and the cables as indicated in the Work Instructions, circuit drawing/ Work Instructions/ SOPs provided at each station		4	1	3
	PC13. Ensure proper crimping of the wire terminals and twisting of wire bunch as specified in the Work Instructions		4	1	3
	PC14. Remove loops and entanglements and do the tapping operation to ensure hassle free electrical connections		4	1	3
	PC15. Check the correct orientation of the clip from the circuit diagram		4	1	3
	PC16. In case of electronic component assembly, ensure selection of components as per the capacity/ rating required for the component		4	1	3
	PC17. Ensure proper placement of the electronic components on the blank PCB as per the circuit diagram		3	1	2
	PC18. Solder the components using manual soldering rod/ automatic solder by applying the specified current and temperature and the flux, as specified in the Work Instructions		4	1	3
	PC19. Ensure correct bundling of the wires and terminals which need to be welded		4	1	3
	PC20. Place and align the wires as per the work standards		3	1	2
	PC21. Adjust the wire bundles on the welding block and properly clamp the bundle		3	1	2
	PC22. Adjust current settings and pass High frequency current through the bundled wires to bond them together		3	1	2
	PC23. Put insulator/ safety sheaths on the crimped/ welded wires for protection		3	1	2
	PC24. Conduct visual inspection of the bundled electrical and electronics wiring, Circuits and harness		3	1	2

	PC25. Check for orientation of terminals		3	1	2
	PC26. Check for correct product number and connections as specified in the Work Instructions		3	1	2
	PC27. Check for correct Input /output connectors		3	1	2
	PC28. Test for any short circuit/ open circuit through the lamp glow test		3	1	2
	PC29. Inspect the wire bundle for length, orientation, path, part fitment and before packing the wire assembly		3	1	2
	Total		**100**	**30**	**70**
5. ASC/N3613 Performing the quality checks and inspection of the finished products (Auto Components/ Vehicles)	PC1. Ensure full inspection of the physical body of the Auto Component/ Automobile to detect any quality related defects related to body surface, paint, dents, grooves, cracks, rough edges etc.	100	3	1	2
	PC2. Ensure inspection of the specimen in proper lighting so that detection of errors is fast and accurate		3	1	2
	PC3. Ensure inspection of all major components of the automobile including body surface, doors, tyres, wheels, wind shield, internal seating, dashboard etc.		3	1	2
	PC4. Ensure part clearances as specified in the Work Instructions/ Standard Operating Processes		3	1	2
	PC5. Mark all the observed physical detects using a chalk stick or any other erasable substance to identify the potential rework areas which can be immediately addressed to team		3	1	2
	PC6. Ensure that every manufactured vehicle is rolled up to the dynamometer testing area to test the torque, Horsepower, speed, roll speed and heat load		3	1	2
	PC7. Ensure that the connections for the test vehicle are properly applied to the test bench		4	1	3
	PC8. Ensure that the vehicle is accelerated to the desired limits as indicated in the Test station chart and Standard Operating Procedures		4	1	3
	PC9. Observe the control panel and display of the dynamometer and record the readings in the given formats		4	1	3
	PC10. Ensure that the vehicle is properly mount on the wheel balancing machine to test vibration of the wheels and tires.		4	1	3

	PC11. Conduct the test and record any observations on wheeling wobbling, vibrations and any other type of disturbances		4	1	3
	PC12. Ensure Runout for all radial tyres as per the standards laid down in the Work Instructions/ SOPs/ Control Plan		5	2	3
	PC13. Ensure correct observations of all performance testing charts and graphs to note the performance characteristics and related reading and test values/ outcome		4	1	3
	PC14. Ensure that the errors are tagged/ marked immediately so that they can be rectified at the earliest and the vehicle can be prepared for dispatch		4	1	3
	PC15. Ensure that all the errors observed are noted in the log books as per the format shared with the operators		5	2	3
	PC16. Ensure the working of the lighting systems and the headlamp focus by turning on the internal cabin lights and headlamps and checking the working of lighting circuit and headlamps focus		4	1	3
	PC17. Check the working of the key vehicle dashboard indicators by turning on the engine		4	1	3
	PC18. Ensure that the horn and Indicator system are working by turning on the respective systems and checking the horn and indicator circuit		4	1	3
	PC19. Ensure that every Automobile manufactured undergoes a shower test for testing water leakages in the vehicle		4	1	3
	PC20. Ensure that all shower nozzles, water supply pipes, water circulation motor and the blower are in order		4	1	3
	PC21. Ensure that all doors and windows are tightly closed when the automobile enters the Shower testing area		3	1	2
	PC22. Ensure that the correct parameters on water pressure, water spray angles and test time are followed during the test		3	1	2
	PC23. Monitor the flow of water and detect any leakages happening through wind shield, tailgate shield, windows and door frame/ rubber padding on doors & windows		3	1	2
	PC24. Ensure that the errors are informed to the supervisor immediately so that they can be rectified and the vehicle can be		3	1	2

	prepared for dispatch				
	PC25. Conduct testing for components like brakes, shock absorbers etc. and observe the performance values on parameters like loading, resistance etc.		3	1	2
	PC26. Ensure the tests meets the required performance levels as indicated in the Work Instructions/ SOP manuals		3	1	2
	PC27. Clean the automobile after the shower test and make it ready for dispatch. Use manual cleaning methods, component washer, air pressure as per application		3	1	2
	PC28. Check the availability of all the Vehicle manuals and the relevant manufacturing papers in the Automobile for the customer		3	1	2
	Total		**100**	**30**	**70**
6. ASC/N0006 Maintain a safe and healthy working environment	PC1. Identify activities which can cause potential injury through sharp objects, burns, fall, electricity, gas leakages, radiation, poisonous fumes, chemicals, loud noise.	100	6	2	4
	PC2. Identify areas at work place which are potentially hazardous/ unhygienic in nature		6	2	4
	PC3. Conduct regular checks with support of the maintenance team on machine health to identify potential hazards due to wear and tear of machine for prevention and corrective actions.		7	2	5
	PC4. Inform the concerned authorities about the potential risks identified in the processes, workplace area/ layout, materials used etc.		7	2	5
	PC5. Inform the concerned authorities about damages which can potentially harm man/ machine during operations		7	2	5
	PC6. Create awareness amongst other by sharing information on the identified risks.		7	2	5
	PC7. Support the Safety team and the supervisor in creating the risk mitigation plan.		7	2	5
	PC8. Follow the instructions given on the equipment manual describing the operating process of the equipment.		7	2	5
	PC9. Follow the Safety, Health and Environment related practices developed by the organization.		7	2	5
	PC10. Operate the machine using the		7	2	5

	recommended Personal Protective Equipment (PPE) and ensure team members also use the related PPEs at the workplace.				
	PC11. Maintain a clean and safe working environment near the workplace and ensure there is no spillage of chemicals, production waste, oil, solvents etc.		7	2	5
	PC12. Attend all safety and fire drills to be self aware of safety hazards and preventive techniques.		7	2	5
	PC13. Maintain high standards of personal hygiene at the work place.		6	2	4
	PC14. Ensure that the waste disposal takes place in the designated area as per organization SOP.		6	2	4
	PC15. Inform the medical officer/ HR in case of self or an employee's illness of contagious nature so that preventive actions can be planned for others.		6	2	4
	Total		**100**	**30**	**70**
7. ASC/N0021 Maintain 5S at the work premises	PC1. Follow the sorting process and check that the tools, fixtures & jigs that are lying on workstations are the ones in use and un-necessary items are not cluttering the workbenches or work surfaces.	100	3	1	2
	PC2. Ensure segregation of waste in hazardous/ non Hazardous waste as per the sorting work instructions.		3	1	2
	PC3. Follow the technique of waste disposal and waste storage in the proper bins as per SOP.		3	1	2
	PC4. Segregate the items which are labeled as red tag items for the process area and keep them in the correct places.		4	1	3
	PC5. Sort the tools/ equipment/ fasteners/ spare parts as per specifications/ utility into proper trays, cabinets, lockers as mentioned in the 5S guidelines/ work instructions.		4	1	3
	PC6. Ensure that areas of material storage areas are not overflowing.		4	1	3
	PC7. Properly stack the various types of boxes and containers as per the size/ utility to avoid any fall of items/ breakage and also enable easy sorting		4	1	3

	when required.				
	PC8. Return the extra material and tools to the designated sections and make sure that no additional material/ tool is lying near the work area.		4	1	3
	PC9. Follow the floor markings/ area markings used for demarcating the various sections in the plant as per the prescribed instructions and standards.		4	1	3
	PC10. Ensure proper labeling mechanism of instruments/ boxes/ containers and maintaining reference files/ documents with the codes and the lists.		4	1	3
	PC11. Check that the items in the respective areas have been identified as broken or damaged		4	1	3
	PC12. Follow the given instructions and check for labeling of fluids, oils. Lubricants, solvents, chemicals etc. And proper storage of the same to avoid spillage, leakage, fire etc.		4	1	3
	PC13. Make sure that all material and tools are stored in the designated places and in the manner indicated in the 5S instructions.		4	1	3
	PC14. Check whether safety glasses are clean and in good condition.		4	1	3
	PC15. Keep all outside surfaces of recycling containers are clean		4	1	3
	PC16. Ensure that the area has floors swept, machinery clean and generally clean. In case of cleaning, ensure that proper displays are maintained on the floor which indicate potential safety hazards		4	1	3
	PC17. Check whether all hoses, cabling & wires are clean, in good condition and clamped to avoid any mishap or mix up.		4	1	3
	PC18. Ensure workbenches and work surfaces are clean and in good condition.		4	1	3
	PC19. Follow the cleaning schedule for the		4	1	3

	lighting system to ensure proper illumination.				
	PC20. Store the cleaning material and equipment in the correct location and in good condition.		4	1	3
	PC21. Ensure self-cleanliness - clean uniform, clean shoes, clean gloves, clean helmets, personal hygiene.		4	1	3
	PC22. Follow the daily cleaning standards and schedules to create a clean working environment.		3	1	2
	PC23. Attend all training programs for employees on 5S.		3	1	2
	PC24. Support the team during the audit of 5S.		3	1	2
	PC25. Participate actively in employee work groups on 5S and encourage team members for active participation.		3	1	2
	PC26. Follow the guidelines for What to do and What not to do to build sustainability in 5S as mentioned in the 5S check lists/ work instructions.		3	1	2
	Total		**100**	**30**	**70**
	Grand Total	**750**	**750**	**225**	**525**
	Percentage Weightage (%)			**30**	**70**