

Qualification Pack



Vehicle Assembly Fitter

QP Code: ASC/Q3601

Version: 1.0

NSQF Level: 4

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

Qualification Pack

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ASC/Q3601: Vehicle Assembly Fitter

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.

Applicable National Occupational Standards (NOS)

Compulsory NOS:

1. [ASC/N0006: Maintain a safe and healthy working environment](#)
2. [ASC/N0021: Maintain 5S at the work premises](#)
3. [ASC/N3609: Understand processes and equipment requirement for assembly operation of vehicles](#)
4. [ASC/N3610: Prepare the machine, auxiliaries and work pieces for vehicle assembly](#)
5. [ASC/N3611: Perform the Mechanical Assembling operation for all mechanical components](#)
6. [ASC/N3612: Perform the electrical assembly operation](#)
7. [ASC/N3613: Perform the Quality Checks and Inspection of the finished products \(Auto Components/ Vehicles\)](#)

Qualification Pack (QP) Parameters

Sector	Automotive
Sub-Sector	Manufacturing
Occupation	Assembly
Country	India
NSQF Level	4
Aligned to NCO/ISCO/ISIC Code	NCO-2015/8211.1201

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Minimum Educational Qualification & Experience	10th Class with 1-2 years of experience In assembly operations
Minimum Level of Education for Training in School	
Pre-Requisite License or Training	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	18 Years
Last Reviewed On	15/09/2013
Next Review Date	31/03/2021
Deactivation Date	31/03/2021
NSQC Approval Date	05/08/2015
Version	1.0

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ASC/N0006: Maintain a safe and healthy working environment

Description

This NOS 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 and training team members on health and safety related issues

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

Elements and Performance Criteria

Identify and report the risks identified

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

- PC1..** Identify activities which can cause potential injury through sharp objects, burns, fall, electricity, gas leakages, radiation, poisonous fumes, chemicals, loud noise
- PC2.** Inform the concerned authorities about the potential risks identified in the processes, workplace area/ layout, materials used etc
- PC3.** Inform the concerned authorities about machine breakdowns, damages which can potentially harm man/ machine during operations
- PC4.** Create awareness amongst other by sharing information on the identified risks

Create and sustain a Safe, clean and environment friendly work place

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

- PC5..** Follow the instructions given on the equipment manual describing the operating process of the equipments
- PC6..** Follow the Safety, Health and Environment related practices developed by the organization
- PC7.** Operate the machine using the recommended Personal Protective Equipments (PPE)
- PC8. .** Maintain a clean and safe working environment near the work place and ensure there is no spillage of chemicals, production waste, oil, solvents etc
- PC9.** Maintain high standards of personal hygiene at the work place
- PC10.** Ensure that the waste disposal is done in the designated area and manner as per organization SOP.
- PC11.** Inform appropriately the medical officer/ HR in case of self or an employees illness of contagious nature so that preventive actions can be planned for others

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

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- KU1.** relevant standards, procedures and policies related to Health, Safety and Environment followed in the company
- KU2.** basic knowledge of Safety procedures(fire fighting, first aid) within the organization
- KU3.** knowledge of various types of PPEs and their usage
- KU4.** basic knowledge of risks/hazards associated with each occupation in the organization
- KU5.** how to safely operate various tools and machines and risks associated with the tools/ equipment
- KU6.** knowledge of personal hygiene and how an individual can contribute towards creating a highly safe and clean working environment

Generic Skills (GS)

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

- GS1.** write basic level notes and observations
- GS2.** read safety instructions put up across the plant premises
- GS3.** read safety precautions mentioned in equipment manuals and panels to understand the potential risks associated
- GS4.** effectively communicate information to team members
- GS5.** inform employees in the plant and concerned functions about events, incidents & potential risks observed related to Safety, Health and Environment.
- GS6.** question operator/ supervisor in order to understand the safety related issues
- GS7.** attentively listen with full attention and comprehend the information given by the speaker during safety drills and training programs
- GS8.** use common sense and make judgments during day to day basis
- GS9.** use reasoning skills to identify and resolve basic problems
- GS10.** use common sense and make judgments during day to day basis
- GS11.** use reasoning skills to identify and resolve basic problems

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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Identify and report the risks identified</i>	8	23	-	-
PC1.. Identify activities which can cause potential injury through sharp objects, burns, fall, electricity, gas leakages, radiation, poisonous fumes, chemicals ,loud noise	3	6	-	-
PC2. Inform the concerned authorities about the potential risks identified in the processes, workplace area/ layout, materials used etc	2	6	-	-
PC3. Inform the concerned authorities about machine breakdowns, damages which can potentially harm man/ machine during operations	2	6	-	-
PC4. Create awareness amongst other by sharing information on the identified risks	1	5	-	-
<i>Create and sustain a Safe, clean and environment friendly work place</i>	17	52	-	-
PC5.. Follow the instructions given on the equipment manual describing the operating process of the equipments	3	7	-	-
PC6.. Follow the Safety, Health and Environment related practices developed by the organization	3	8	-	-
PC7. Operate the machine using the recommended Personal Protective Equipments (PPE)	3	8	-	-
PC8. . Maintain a clean and safe working environment near the work place and ensure there is no spillage of chemicals, production waste, oil, solvents etc	2	8	-	-
PC9. Maintain high standards of personal hygiene at the work place	2	7	-	-
PC10. Ensure that the waste disposal is done in the designated area and manner as per organization SOP.	3	8	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC11. Inform appropriately the medical officer/ HR in case of self or an employees illness of contagious nature so that preventive actions can be planned for others	1	6	-	-
NOS Total	25	75	-	-

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National Occupational Standards (NOS) Parameters

NOS Code	ASC/N0006
NOS Name	Maintain a safe and healthy working environment
Sector	Automotive
Sub-Sector	Manufacturing
Occupation	Maintenance
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	15/09/2013
Next Review Date	15/09/2015
NSQC Clearance Date	20/07/2015

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ASC/N0021: 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

Elements and Performance Criteria

Ensure sorting

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

- PC1..** follow the sorting process and check that the tools, fixtures & jigs that are lying on workstations are the ones in use and unnecessary 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
- PC10.** follow the proper labeling mechanism of instruments/ boxes/ containers and maintaining reference files/ documents with the codes and the lists

Ensure proper documentation and storage (organizing , streamlining)

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

- 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

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

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- 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

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

- PC22.** follow the daily cleaning standards and schedules to create a clean working environment
- PC23.** attend all training programs for employees on 5 s
- PC24.** support the team during the audit of 5 s
- PC25.** participate actively in employee work groups on 5s and encourage team members for active participation
- 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

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** relevant standards, procedures and policies related to 5S followed in the company
- KU2.** have basic knowledge of 5S procedures
- KU3.** know various types 5s practices followed in various areas
- KU4.** understand the 5S checklists provided in the department/ team
- KU5.** have skills to identify useful & non useful items
- KU6.** have knowledge of labels , signs & colours used as indicators
- KU7.** knowledge on how to sort and store various types of tools, equipment, material etc.
- KU8.** know , how to identify various types of waste products
- KU9.** understand the impact of waste/ dirt/ dust/unwanted substances on the process/ environment/ machinery/ human body
- KU10.** have knowledge of best ways of cleaning & waste disposal
- KU11.** understand the importance of standardization in processes
- KU12.** understand the importance of sustainability in 5S
- KU13.** have knowledge of TQM process
- KU14.** have knowledge of various materials and storage norms
- KU15.** understand visual controls, symbols, graphs etc.

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Generic Skills (GS)

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

- GS1.** write basic level notes and observations
- GS2.** note down observations (if any) related to the process
- GS3.** read 5S instructions put up across the plant premises
- GS4.** effectively communicate information to team members inform employees in the plant and concerned functions about 5S
- GS5.** question the process head in order to understand the 5S related issues
- GS6.** attentively listen with full attention and comprehend the information given by the speaker during 5S training programs
- GS7.** use common sense and make judgments during day to day basis
- GS8.** use reasoning skills to identify and resolve basic problems using 5S
- GS9.** persuade co team members to follow 5 S
- GS10.** ensure that the co team members understand the importance of using 5 S tool
- GS11.** use innovative skills to perform and manage 5 S activities at the work desk and the shop floor
- GS12.** exhibit inquisitive behaviour to seek feedback and question on the existing set patterns of work
- GS13.** do what is right, not what is a popular practices
- GS14.** follow shop floor rules& regulations and avoid deviations; make 5S an integral way of life
- GS15.** ensure self-cleanliness on a daily basis
- GS16.** demonstrate the will to keep the work area in a clean and orderly manner

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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Ensure sorting</i>	10	30	-	-
PC1.. follow the sorting process and check that the tools, fixtures & jigs that are lying on workstations are the ones in use and unnecessary items are not cluttering the workbenches or work surfaces.	1	3	-	-
PC2.. ensure segregation of waste in hazardous/ non hazardous waste as per the sorting work instructions	1	3	-	-
PC3.. follow the technique of waste disposal and waste storage in the proper bins as per sop	1	3	-	-
PC4.. segregate the items which are labelled as red tag items for the process area and keep them in the correct places	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	1	3	-	-
PC6. . ensure that areas of material storage areas are not overflowing	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 when required	1	3	-	-
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	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	1	3	-	-
PC10. follow the proper labeling mechanism of instruments/ boxes/ containers and maintaining reference files/ documents with the codes and the lists	1	3	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Ensure proper documentation and storage (organizing , streamlining)</i>	3	9	-	-
PC11. check that the items in the respective areas have been identified as broken or damaged	1	3	-	-
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	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	1	3	-	-
<i>Ensure cleaning of self and the work place</i>	8	24	-	-
PC14. check whether safety glasses are clean and in good condition	1	3	-	-
PC15. keep all outside surfaces of recycling containers are clean	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	1	3	-	-
PC17.. check whether all hoses, cabling & wires are clean, in good condition and clamped to avoid any mishap or mix up	1	3	-	-
PC18.. ensure workbenches and work surfaces are clean and in good condition	1	3	-	-
PC19. follow the cleaning schedule for the lighting system to ensure proper illumination	1	3	-	-
PC20. store the cleaning material and equipment in the correct location and in good condition	1	3	-	-
PC21. ensure self-cleanliness - clean uniform, clean shoes, clean gloves, clean helmets, personal hygiene	1	3	-	-
<i>Ensure sustenance</i>	4	12	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC22. follow the daily cleaning standards and schedules to create a clean working environment	1	3	-	-
PC23. attend all training programs for employees on 5 s	0.5	2	-	-
PC24. support the team during the audit of 5 s	1	3	-	-
PC25. participate actively in employee work groups on 5s and encourage team members for active participation	0.5	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	1	2	-	-
NOS Total	25	75	-	-

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National Occupational Standards (NOS) Parameters

NOS Code	ASC/N0021
NOS Name	Maintain 5S at the work premises
Sector	Automotive
Sub-Sector	Generic
Occupation	Generic
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	15/03/2014
Next Review Date	15/03/2016
NSQC Clearance Date	

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ASC/N3609: 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

Elements and Performance Criteria

Understand the assembling requirements, assembling equipment and parameters to be set for the process

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

- 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 torquing 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 donts of the manufacturing process as defined in sops/ work instructions or defined by supervisors

Escalations of queries on the given job

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

- 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

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Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** relevant standards and procedures followed in the company
- KU2.** different types of products manufactured by the company
- KU3.** functional processes like Procurement, Store management, inventory management, quality management and key contact points for query resolution
- KU4.** different types of assembling processes and associated equipments
- KU5.** the method of reading and interpreting the various gauges
- KU6.** how to visualize the final product output and conduct quality verification tests.
- KU7.** the impact of various physical parameters like torquing and tightening on the properties of final output product like durability, surface finish, part movement, aesthetics etc
- KU8.** hazards and safety aspects involved in assembling activities and usage of relevant PPEs

Generic Skills (GS)

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

- GS1.** document information
- GS2.** note down observations (if any) related to the assembling process
- GS3.** write information documents to internal departments/ internal teams or enter the information in online ERP systems under guidance of the supervisor
- GS4.** read and interpret technical specifications of the assemble specimen
- GS5.** read equipment manuals and process documents to understand the equipment and processes better
- GS6.** read internal information documents sent by internal teams
- GS7.** discuss task lists, schedules and activities with the supervisor
- GS8.** effectively communicate with the team members
- GS9.** question the assembling shop supervisor in order to understand the nature of the problem and to clarify queries
- GS10.** attentively listen with full attention and comprehend the information given by the speaker
- GS11.** plan and organize the work order and jobs received from the Operator
- GS12.** organize all process/ equipment manuals so that sorting/ accessing information is easy
- GS13.** keep fixtures, tools, drawings, Work Instructions, SOP manuals as per the part number, colour codes etc. as defined under the 5S systems
- GS14.** support the supervisor in scheduling tasks for helper and assistant supervisor
- GS15.** use common sense and make judgments during day to day basis
- GS16.** 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
- GS17.** follow instructions and work on areas of improvement identified
- GS18.** complete the assigned tasks with minimum supervision
- GS19.** complete the job defined by the supervisor within timelines and quality norms

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- GS20.** detect problems in day to day tasks
- GS21.** support supervisor in using specific problem solving techniques and detailing out the problems
- GS22.** discuss possible solution with the supervisor for problem solving
- GS23.** make decisions in emergency conditions in case the supervisor is not available(as per the authority matrix defined by the organization)

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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Understand the assembling requirements, assembling equipment and parameters to be set for the process</i>	21	49	-	-
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	3	7	-	-
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	3	7	-	-
PC3. . understand the material required and the equipment availability for executing the activity	3	7	-	-
PC4. . understand the type of nut runners and torqueing equipment required to be used for the assembling process	3	7	-	-
PC5. . understand the various nuts, bolts, rivets, fasteners, covering sheaths etc kept in the various side trays (assembly kits)	3	7	-	-
PC6.. understand 5 s and safety related aspects related to the work station, assembly line	3	7	-	-
PC7. . clearly understanding the does and donts of the manufacturing process as defined in sops/ work instructions or defined by supervisors	3	7	-	-
<i>Escalations of queries on the given job</i>	9	21	-	-
PC8. . refer the queries to a competent internal specialist if they cannot be resolved by the assembler on own	3	7	-	-
PC9. . obtain help or advice from specialist if the problem is outside his/her area of competence or experience	3	7	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10. . confirm self-understanding with the specialist holding discussions so that all doubts & queries can be resolved before the actual process execution	3	7	-	-
NOS Total	30	70	-	-

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National Occupational Standards (NOS) Parameters

NOS Code	ASC/N3609
NOS Name	Understand processes and equipment requirement for assembly operation of vehicles
Sector	Automotive
Sub-Sector	Manufacturing
Occupation	Assembly
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	15/09/2013
Next Review Date	15/09/2015
NSQC Clearance Date	

Qualification Pack

ASC/N3610: 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, Weldshop, maintenance team, vehicle testing team, QA/QC and material management team. The activities will be similar for Body on Frame/ Monocoque assembly

Elements and Performance Criteria

Arrange for equipment, PPE's and other material as per the requirement of the assembling process

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

- 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

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

- 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 gun is 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

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

- 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

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Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** relevant standards and procedures followed in the company
- KU2.** different types of products manufactured by the company
- KU3.** functional processes like Procurement, Store management, inventory management, quality management and key contact points for query resolution
- KU4.** different types of assembling processes
- KU5.** different equipment and components used in the assembly process bolts, nuts, screws, wires, fasteners, connectors, sealants, adhesive bonding equipment, boring drills, Torque testers
- KU6.** different types of bolting guns/ riveting guns used in the assembly process
- KU7.** size for tightening equipment like spanners, screw drivers, testers
- KU8.** the method of reading and interpreting the various gauges
- KU9.** impact of various assembly process like bolting, torqueing, fitting, greasing, hammering, sealing, clamping on the final component/ vehicle performance
- KU10.** how to visualize the final product output and conduct quality verification tests
- KU11.** hazards and safety aspects involved in assembling activities and usage of relevant PPEs

Generic Skills (GS)

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

- GS1.** document information
- GS2.** note down observations (if any) related to the assembling process
- GS3.** write information documents to internal departments/ internal teams or enter the information in online ERP systems under guidance of the supervisor
- GS4.** read and interpret technical specifications of the assemble specimen
- GS5.** read equipment manuals and process documents to understand the equipments and processes better
- GS6.** read internal information documents sent by internal teams
- GS7.** discuss task lists, schedules and activities with the supervisor
- GS8.** effectively communicate with the team members
- GS9.** question the assembling shop supervisor in order to understand the nature of the problem and to clarify queries
- GS10.** attentively listen with full attention and comprehend the information given by the speaker
- GS11.** plan and organize the work order and jobs received from the Operator
- GS12.** keep fixtures, tools, drawings, Work Instructions, SOP manuals as per the part number, colour codes etc. as defined under the 5S systems
- GS13.** organize all process/ equipment manuals so that sorting/ accessing information is easy
- GS14.** visualize the final job product after understanding the given drawing/ sketches/ Work Instruction/ SOP

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- GS15.** 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
- GS16.** use common sense and make judgments during day to day basis
- GS17.** use reasoning skills to identify and resolve basic problems
- GS18.** follow instructions and work on areas of improvement identified and complete the assigned tasks with minimum supervision
- GS19.** complete the job defined by the supervisor within the timelines and quality norms
- GS20.** take initiatives in driving small projects with the supervisor like operation improvement, training of helpers and assistant operators, 5S, Kaizen etc.

Qualification Pack

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Arrange for equipment, PPE's and other material as per the requirement of the assembling process</i>	12	35	-	-
PC1. . understand the material required and the equipment availability for executing the activity	3	9	-	-
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	3	9	-	-
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	3	9	-	-
PC4. . ensure that the helper/ assistant technician brings the required material and tools before the start of the assembling operations	3	8	-	-
<i>Check, clean and setup the assembly equipment</i>	9	24	-	-
PC5. . setup the assembling apparatus as per the selected assembling process and the internal sops/ work instructions and the setting standards for the machine	3	8	-	-
PC6.. ensure that the surface of the assembling gun/ bolting gun is cleaned to remove dust and any other impurities	3	8	-	-
PC7. . ensure that the hoists & cranes for lifting the parts are working in order as per the process requirement	3	8	-	-
<i>Escalations of queries for the given job</i>	4	16	-	-
PC8. . immediately refer the queries to the supervisor to avoid any delay in the actual process	2	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	2	8	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
NOS Total	25	75	-	-

Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N3610
NOS Name	Prepare the machine, auxiliaries and work pieces for vehicle assembly
Sector	Automotive
Sub-Sector	Manufacturing
Occupation	Assembly
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	15/09/2013
Next Review Date	15/09/2015
NSQC Clearance Date	

Qualification Pack

ASC/N3611: 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

Elements and Performance Criteria

Read and interpret the assembly drawing/ blue print/Work Instruction

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

- PC1.** . understand the assembly operations from the assembly drawing/ blue print work instructions/ sops 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

Arrange the parts to be assembled in the given position

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

- 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

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

- PC11.** . carefully insert the right bolts, screw, rivet in the required place in the part of be assembled

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- 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 torquing 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 valves 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 process adhere 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

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

- 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

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- 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

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

- 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

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

- 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 (KU)

The individual on the job needs to know and understand:

- KU1.** relevant standards and procedures followed in the company
- KU2.** different types of products manufactured by the company
- KU3.** knowledge of functional processes like store management, inventory management, quality management and key contact points for query resolution
- KU4.** different types of assembling processes and component storage process (Kitting)
- KU5.** 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)
- KU6.** different types of bolting guns/ riveting guns/ Hand held/ Power drills used in the assembly process
- KU7.** size for tightening equipment like spanners, screw drivers, wrenches, pliers testers
- KU8.** numbering/ identification nomenclature for the various assembly and tightening equipment
- KU9.** the method of reading and interpreting the various gauges, meters, graphs, dials
- KU10.** reading and interpreting torqueing charts and usage of Torque Meters
- KU11.** impact of various assembly process like bolting, torqueing, tightening, fitting, greasing, hammering, sealing, clamping on the final component/ vehicle performance
- KU12.** different types of defects which may arise due to improper tightening and torqueing
- KU13.** how to visualize the final product output and conduct quality verification tests
- KU14.** how to operate both in automatic and manual mode
- KU15.** 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
- KU16.** hazards and safety aspects involved in assembling activities and usage of relevant PPEs

Generic Skills (GS)

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

- GS1.** document information
- GS2.** read equipment manuals and process documents to understand the equipment and processes better
- GS3.** read internal information memos shared by internal customers (other functions within the organization)
- GS4.** discuss task lists, schedules, and work-loads with co-workers
- GS5.** question internal customers/ assemble shop supervisor in order to understand the nature of the problem and make a diagnosis
- GS6.** plan and organize the work order and jobs received from the internal customers
- GS7.** plan and organize the design/ process/quality documents received from internal customers.
- GS8.** keep fixtures, tools, drawings, Work Instructions, SOP manuals as per the part number, colour codes etc. as defined under the 5S systems
- GS9.** organize all process/ equipment manuals so that sorting out information is fast
- GS10.** carefully analyze the body part for various assembling defects at every station
- GS11.** carefully run the production line with relevant actions as listed in SOP/WI if some delay, or power supply problem happens

Qualification Pack

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Read and interpret the assembly drawing/ blue print/Work Instruction</i>	3	5	-	-
PC1. . understand the assembly operations from the assembly drawing/ blue print work instructions/ sops supplied on the assembly line	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	1	2	-	-
PC3. . read the specifications manuals and plan assembly or building operations	1	1	-	-
<i>Arrange the parts to be assembled in the given position</i>	7	13	-	-
PC4. . ensure drop of sub-assemblies like frame , gear box, axles, car frame, etc. at the respective stations without damaging the components	1	2	-	-
PC5. . correctly position or align components for assembly, manually or using hoists	1	2	-	-
PC6. . ensure that hoists are used to lift the right material from the conveyors, bins, part trolleys etc.	1	2	-	-
PC7.. ensure part clearances as specified in the work instructions/ standard operating processes	1	1	-	-
PC8. . assemble the required parts using pneumatic, hydraulic/ plc controlled assembly tools	1	2	-	-
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	1	2	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
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)	1	2	-	-
<i>Conduct the Assembly operations for the components</i>	14	35	-	-
PC11. . carefully insert the right bolts, screw, rivet in the required place in the part of be assembled	1	2	-	-
PC12. . perform tightening of nuts and bolts using bolting guns/ riveting guns as per the required specifications for fitment of each part	1	2	-	-
PC13. .. ensure right amount of torque application for tightening the bolted components	-	2	-	-
PC14. . check the torque values using a torqueing meter and validate the same with the torque chart provided on the assembly station	1	2	-	-
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	1	2	-	-
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.	1	2	-	-
PC17. . ensure proper installation/ assembly of oil and lube systems by placing the funnel, filters, hose pipes,, glands, sockets, suction guns and regulator valves and fitting them using couplers, nuts, screws as prescribed in the work instructions/ sops/ control plans	1	2	-	-
PC18. . ensure proper sealing of the required areas to prevent any leakage of water/ air etc. during the usage of the component/ vehicle	1	2	-	-

Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC19. . 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 the organization	1	2	-	-
PC20. . ensure proper lubrication of parts as instructed in the work instructions/ sop	-	2	-	-
PC21.. ensure that the assembly operations are completed as per the specified time and performance levels	1	1	-	-
PC22. . ensure that the fixtures and the assembly equipment is kept back to their respective locations once the process has been completed	1	2	-	-
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	1	2	-	-
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	1	2	-	-
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	1	2	-	-
PC26. . ensure that while assembling the components, the aesthetic properties of the final output like component/ vehicle is maintained	1	2	-	-
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	-	2	-	-
PC28.. ensure proper storage of extra grease, lubrication oil etc. to prevent any contamination through moisture, dust, dirt	-	2	-	-
<i>Conduct Auxiliary Assembly process</i>	3	10	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC29. ensure insertion of pins, sleeves, bushes, bearings, connectors etc. in the housing as per the work instructions/ sops mentioned	1	2	-	-
PC30. ensure orientation, alignment and angle adjustment value of angle, distance, response to gauges	-	2	-	-
PC31. ensure tightening of threaded fasteners - torque level of tightening and sequencing of fastening	-	2	-	-
PC32. ensure sealing of gap areas with rubber or adhesives as per the work instructions/ sops	1	2	-	-
PC33. ensure proper lubrication/ greasing/ oiling of components as per the quantity of application mentioned in the work instructions/ sops	1	2	-	-
<i>Conduct the fuel filling operation as the fuel station</i>	1	3	-	-
PC34. safely conduct the fuel filling operation at the respective station	1	2	-	-
PC35. ensure that proper safety norms are followed at the time of the vehicle fuelling	-	1	-	-
<i>Inspection and Testing of assembled components</i>	2	4	-	-
PC36. verify functioning, machine capabilities, or conformance to customer specifications	1	2	-	-
PC37. complete the dynamometer, head lamp focus, shower, wheel alignment and roll & brake testing	1	2	-	-
NOS Total	30	70	-	-

Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N3611
NOS Name	Perform the Mechanical Assembling operation for all mechanical components
Sector	Automotive
Sub-Sector	Manufacturing
Occupation	Assembly
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	15/09/2013
Next Review Date	15/09/2015
NSQC Clearance Date	

Qualification Pack

ASC/N3612: 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

Elements and Performance Criteria

Read and interpret the assembly drawing/ blue print/Work Instructions

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

- 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

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

- 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

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

- 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

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- 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

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

- 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

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

- 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 (KU)

The individual on the job needs to know and understand:

- KU1.** relevant standards and procedures followed in the company
- KU2.** different types of products manufactured by the company
- KU3.** knowledge of functional processes like store management, inventory management, quality management and key contact points for query resolution
- KU4.** different types of colour codes and their meaning for electrical wires

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- KU5.** drawing and route/ circuit diagram
- KU6.** electrical/ electronic symbols used on the assembly boards
- KU7.** different tools used during electrical assembly crimpers, fasteners, twisting pliers, testers, screw drivers, bolts, screws etc.
- KU8.** different types of wire covers, insulators and sheaths to be used
- KU9.** the method of reading and interpreting the various gauges, meters, graphs, dials
- KU10.** computer display and analysis techniques
- KU11.** how to visualize the final product output and hence decide on the key steps to be followed
- KU12.** various inspection techniques used for testing of electrical components
- KU13.** impact of various electrical conditions on the performance of the equipment
- KU14.** 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
- KU15.** various PPEs to be used during electrical assembly operations
- KU16.** mechanisms for disposal of waste material and scrap
- KU17.** occupational hazards associated while working on electrical circuits

Generic Skills (GS)

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

- GS1.** document information
- GS2.** maintain records of production and defects
- GS3.** draw basic level circuit layouts and connection diagrams
- GS4.** read equipment manuals and process documents to understand the equipment and processes better
- GS5.** understand electrical and electronic symbols used in the circuits
- GS6.** read internal information memos shared by internal customers (other functions within the organization)
- GS7.** discuss task lists, schedules, and work-loads with co-workers
- GS8.** question internal customers/ assemble shop supervisor in order to understand the nature of the problem and make a diagnosis
- GS9.** plan and organize the work order and jobs received from the internal customers
- GS10.** plan and organize the design/ process/quality documents received from internal customers
- GS11.** keep fixtures, tools, drawings, Work Instructions, SOP manuals as per the part number, colour codes etc as defined under the 5S systems
- GS12.** organize all process/ equipment manuals so that sorting out information is fast
- GS13.** carefully analyze the body part for various assembling defects at every station
- GS14.** carefully run the production line with relevant actions as listed in SOP/WI if some delay, or power supply problem happens

Qualification Pack

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Read and interpret the assembly drawing/ blue print/Work Instructions</i>	3	7	-	-
PC1. . understand the assembly operations from the assembly drawing/ blue print / circuit diagram/ work instructions/ sops supplied on the assembly line	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	1	3	-	-
PC3. . read the specifications manuals and plan assembly operations	1	2	-	-
<i>Arrange the parts to be assembled in the given position</i>	2	6	-	-
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	1	3	-	-
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	1	3	-	-
<i>Assemble electrical and electronic systems</i>	14	32	-	-
PC6. . select the correct program from the program module of the cnc operated assembly machine/ cutting machine/ winding machine	1	3	-	-
PC7.. ensure wire cutting as per the required length specified in the work order	1	2	-	-
PC8. . check the wire dimensions using micrometers. rectify any deviations by changing the machine setting	1	2	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC9. . select the correct terminals/ connectors/ clips and attach the terminals to the correct wires	1	2	-	-
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	2	4	-	-
PC11. .. ensure proper installation of rubber glands/rubber seals to provide insulation/ prevention of moisture seepage	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	1	3	-	-
PC13. .. ensure proper crimping of the wire terminals and twisting of wire bunch as specified in the work instructions	1	2	-	-
PC14. .. remove loops and entanglements and do the tapping operation to ensure hassle free electrical connections	1	3	-	-
PC15. .. check the correct orientation of the clip from the circuit diagram	1	2	-	-
PC16. .. in case of electronic component assembly, ensure selection of components as per the capacity/ rating required for the component	1	2	-	-
PC17. .. ensure proper placement of the electronic components on the blank pcb as per the circuit diagram	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	1	3	-	-
<i>Conduct Ultrasonic or High Frequency welding</i>	5	12	-	-
PC19. .. ensure correct bundling of the wires and terminals which need to be welded	1	2	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC20.. place and align the wires as per the work standards	1	2	-	-
PC21.. adjust the wire bundles on the welding block and properly clamp the bundle	1	3	-	-
PC22.. adjust current settings and pass high frequency current through the bundled wires to bond them together	1	3	-	-
PC23.. put insulator/ safety sheaths on the crimped/ welded wires for protection	1	2	-	-
<i>Inspect or test wiring installations, assemblies, or circuits</i>	6	13	-	-
PC24.. conduct visual inspection of the bundled electrical and electronics wiring, circuits and harness	1	3	-	-
PC25.. check for orientation of terminals	1	2	-	-
PC26.. check for correct product number and connections as specified in the work instructions	1	2	-	-
PC27.. check for correct input /output connectors	1	2	-	-
PC28.. test for any short circuit/ open circuit through the lamp glow test	1	2	-	-
PC29.. inspect the wire bundle for length, orientation, path, part fitment and before packing the wire assembly	1	2	-	-
NOS Total	30	70	-	-

Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N3612
NOS Name	Perform the electrical assembly operation
Sector	Automotive
Sub-Sector	Manufacturing
Occupation	Assembly
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	15/09/2013
Next Review Date	15/09/2015
NSQC Clearance Date	

Qualification Pack

ASC/N3613: 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

Elements and Performance Criteria

Conduct Physical inspection of the manufactured Automobile

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

- 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

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

- 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

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- PC12..** ensure runout 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

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

- 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

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

- 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

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

- 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

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

- 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 (KU)

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The individual on the job needs to know and understand:

- KU1.** relevant standards and procedures followed in the company
- KU2.** different types of products manufactured by the company
- KU3.** knowledge of functional processes like store management, inventory management, quality management and key contact points for query resolution
- KU4.** different types of assembling processes
- KU5.** 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)
- KU6.** numbering/ identification nomenclature for the various assembly and tightening equipment
- KU7.** methods of conducting online inspection of the products using meters, gauges, control tools
- KU8.** methods for checking the calibration of the inspection tools and mechanisms to handle various measurement errors
- KU9.** the method of reading and interpreting the various gauges
- KU10.** impact of various assembly process like bolting, torqueing, tightening, fitting, greasing, hammering, sealing, clamping on the final component/ vehicle performance
- KU11.** different types of defects which may arise due to improper tightening and torqueing
- KU12.** various testing procedures for components and automobiles
- KU13.** hazards and safety aspects involved in assembling activities and usage of relevant PPEs

Generic Skills (GS)

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

- GS1.** document information
- GS2.** note down observations and reading during vehicle testing/ component testing
- GS3.** read equipment manuals and process documents to understand the equipment and processes better
- GS4.** read internal information memos shared by internal customers (other functions within the organization)
- GS5.** discuss task lists, schedules, and work-loads with co-workers
- GS6.** question internal customers/ assemble shop supervisor in order to understand the nature of the problem and make a diagnosis
- GS7.** plan and organize the work order and jobs received from the internal customers
- GS8.** plan and organize the design/ process/quality documents received from internal customers
- GS9.** keep fixtures, tools, drawings, Work Instructions, SOP manuals as per the part number, colour codes etc. as defined under the 5S systems
- GS10.** organize all process/ equipment manuals so that sorting out information is fast
- GS11.** carefully analyze the body part for various assembling defects at every station
- GS12.** carefully analyse each defect observed during inspection and try to find solution for the defect along with the assembly line operator
- GS13.** identify defective parts in the manufacturing line by comparing manufactured pieces with the work standard

Qualification Pack

GS14. link the defect observed with the overall impact on the performance of the component/
automobile

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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Conduct Physical inspection of the manufactured Automobile</i>	5	12	-	-
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.	1	3	-	-
PC2. . ensure inspection of the specimen in proper lighting so that detection of errors is fast and accurate	1	2	-	-
PC3. . ensure inspection of all major components of the automobile including body surface, doors, tyres, wheels, wind shield, internal seating, dashboard etc.	1	2	-	-
PC4. . ensure part clearances as specified in the work instructions/ standard operating processes	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	1	3	-	-
<i>Conduct Wheel Balancing and Dynamometer test on the Automobiles</i>	12	26	-	-
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	1	3	-	-
PC7.. ensure that the connections for the test vehicle are properly applied to the test bench	1	2	-	-
PC8.. ensure that the vehicle is accelerated to the desired limits as indicated in the test station chart and standard operating procedures	1	2	-	-
PC9. . observe the control panel and display of the dynamometer and record the readings in the given formats	2	2	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10.. ensure that the vehicle is properly mount on the wheel balancing machine to test vibration of the wheels and tires	1	3	-	-
PC11.. conduct the test and record any observations on wheeling wobbling, vibrations and any other type of disturbances	2	4	-	-
PC12.. ensure runout for all radial tyres as per the standards laid down in the work instructions/ sops/ control plan	1	2	-	-
PC13.. ensure correct observations of all performance testing charts and graphs to note the performance characteristics and related reading and test values/ outcome	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	1	3	-	-
PC15.. ensure that all the errors observed are noted in the log books as per the format shared with the operators	1	2	-	-
<i>Conduct inspection of key electrical and electronic components</i>	3	7	-	-
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	1	3	-	-
PC17.. check the working of the key vehicle dashboard indicators by turning on the engine	1	2	-	-
PC18.. ensure that the horn and indicator system are working by turning on the respective systems and checking the horn and indicator circuit	1	2	-	-
<i>Conduct Shower test on the Automobiles</i>	6	15	-	-
PC19. . ensure that every automobile manufactured undergoes a shower test for testing water leakages in the vehicle	1	3	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC20. . ensure that all shower nozzles, water supply pipes, water circulation motor and the blower are in order	1	2	-	-
PC21. . ensure that all doors and windows are tightly closed when the automobile enters the shower testing area	1	2	-	-
PC22. . ensure that the correct parameters on water pressure, water spray angles and test time are followed during the test	1	3	-	-
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	1	3	-	-
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	1	2	-	-
<i>Test key components like brakes, shock absorbers</i>	2	5	-	-
PC25.. conduct testing for components like brakes, shock absorbers etc. and observe the performance values on parameters like loading, resistance etc.	1	3	-	-
PC26.. ensure the tests meets the required performance levels as indicated in the work instructions/ sop manuals	1	2	-	-
<i>Conduct final assembly inspection</i>	2	5	-	-
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	1	2	-	-
PC28.. check the availability of all the vehicle manuals and the relevant manufacturing papers in the automobile for the customer	1	3	-	-
NOS Total	30	70	-	-

Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N3613
NOS Name	Perform the Quality Checks and Inspection of the finished products (Auto Components/ Vehicles)
Sector	Automotive
Sub-Sector	Manufacturing
Occupation	Assembly
NSQF Level	4
Credits	TBD
Version	1.0
Last Reviewed Date	15/09/2013
Next Review Date	15/09/2015
NSQC Clearance Date	

Qualification Pack

Assessment Guidelines and Assessment Weightage

Assessment Guidelines

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Element/ Performance Criteria (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 Element/ PC.
2. The assessment for the theory part will be based on knowledge bank of questions created by the SSC.
3. Assessment will be conducted for all compulsory NOS, and where applicable, on the selected elective/option NOS/set of NOS.
4. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below).
5. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/ training center based on these criteria.
6. To pass the Qualification Pack assessment, every trainee should score the Recommended Pass % aggregate for the QP.
7. 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/N0006.Maintain a safe and healthy working environment	25	75	-	-	100	15
ASC/N0021.Maintain 5S at the work premises	25	75	-	-	100	10

Qualification Pack

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
ASC/N3609.Understand processes and equipment requirement for assembly operation of vehicles	30	70	-	-	100	15
ASC/N3610.Prepare the machine, auxiliaries and work pieces for vehicle assembly	25	75	-	-	100	15
ASC/N3611.Perform the Mechanical Assembling operation for all mechanical components	30	70	-	-	100	15
ASC/N3612.Perform the electrical assembly operation	30	70	-	-	100	15
ASC/N3613.Perform the Quality Checks and Inspection of the finished products (Auto Components/ Vehicles)	30	70	-	-	100	15
Total	195	505	-	-	700	100

Qualification Pack

Acronyms

NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
QP	Qualifications Pack
TVET	Technical and Vocational Education and Training

Qualification Pack

Glossary

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

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Knowledge and Understanding (KU)	Knowledge and Understanding (KU) are statements which together specify the technical, generic, professional and organisational specific knowledge that an individual needs in order to perform to the required standard.
Organisational Context	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.
Technical Knowledge	Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
Core Skills/ Generic Skills (GS)	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.
Electives	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.
Options	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.