Model Curriculum

QP Name: Automotive Welding Machine Assistant

QP Code: ASC/Q3101

QP Version: 2.0

NSQF Level: 2

Model Curriculum Version: 1.0

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

Table of Contents

Training Parameters

Sector	Automotive
Sub-Sector	Manufacturing
Occupation	Metal Joining
Country	India
NSQF Level	2
Aligned to NCO/ISCO/ISIC Code	NCO-2015/7212.0801
Minimum Educational Qualification and Experience	8th Class
Pre-Requisite License or Training	NA
Minimum Job Entry Age	14 years
Last Reviewed On	25/03/2021
Next Review Date	25/03/2026
NSQC Approval Date	25/03/2021
QP Version	2.0
Model Curriculum Creation Date	25/03/2021
Model Curriculum Valid Up to Date	25/03/2026
Model Curriculum Version	1.0
Minimum Duration of the Course	270 Hours 00 Minutes
Maximum Duration of the Course	270 Hours 00 Minutes

Program Overview

This section summarizes the end objectives of the program along with its duration.

Training Outcomes

At the end of the program, the learner should have acquired the listed knowledge and skills.

- Carry out pre-welding activities in coordination with welding operator.
- Carry out the support activities related to the welding operations.
- Complete post welding operations under the guidance of the welding operator.
- Work effectively and efficiently as per schedules and timelines.
- Implement safety practices.
- Optimize the use of resources to ensure less wastage and maximum conservation.

Compulsory Modules

The table lists the modules and their duration corresponding to the Compulsory NOS of the QP.

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
Bridge Module	**05:00**	**00:00**			**05:00**
Module 1: Introduction to the role of an Automotive Welding Machine Assistant	05:00	00:00			05:00
ASC/N9803 – Organize work and resources (Manufacturing) **NOS Version No. – 1.0** **NSQF Level – 3**	**15:00**	**30:00**			**45:00**
Module 2: Organize work and resources according to safety and conservation standards	15:00	30:00			45:00
ASC/N9802 – Interact effectively with colleagues, customers and others **NOS Version No. – 1.0** **NSQF Level - 3**	**15:00**	**25:00**			**40:00**
Module 3: Communicate effectively and efficiently	15:00	25:00			40:00
ASC/N3101 – Support the welding operator in routine welding activities **NOS Version No. – 2.0** **NSQF Level - 2**	**60:00**	**120:00**			**180:00**
Module 4: Prepare for welding operations	26:00	54:00			80:00
Module 5: Support in welding and post-welding operations	34:00	66:00			100:00
Total Duration	**95:00**	**175:00**			**270:00**

Module Details

Module Name: Introduction to the role of an Automotive Welding Machine Assistant

Bridge module

Terminal Outcomes:

- Discuss the role and responsibilities of an Automotive Welding Machine Assistant.

Duration: *<05:00>*	**Duration**: *<00:00>*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• List the role and responsibilities of an Automotive Welding Machine Assistant. • Discuss the job opportunities of an Automotive Welding Machine Assistant. • Explain about Indian automotive manufacturing market. • List various automobile Original Equipment Manufacturers (OEMs) and different products/ models manufactured by them. • Discuss the standards and procedures involved in the different operations of welding.	
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	

Module Name: Organize work and resources according to safety and conservation standards

Mapped to ASC/N9803 v1.0

Terminal Outcomes:

- Employ appropriate ways to maintain safe and secure working environment.
- Perform work as per the quality standards.
- Apply conservation practices at the workplace.

Duration: *<15:00>*	**Duration**: *<30:00>*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• List the potential workplace related risks and hazards, their causes and preventions. • Identify PPE to be used at workplace. • Identify various warning signs used at the workplace. • Describe appropriate strategies to deal with emergencies and accidents at the workplace. • Outline the organizational structure to be followed to report about health, safety and security breaches to the concerned authorities. • Discuss the importance of keeping work area clean and tidy. • Discuss the significance of conforming to basic hygiene practices such as washing hands, using alcohol based hand sanitizers or soap. • Discuss organizational hygiene and sanitation guidelines and ways of reporting breaches/gaps if any to the concerned authorities. • Discuss the ways of dealing with stress and anxiety. • Discuss how to complete the given work within the stipulated time period. • Explain how to maintain a proper balance between team and individual goals. • Explain 5S guidelines at workplace. • List the various materials used at the workplace. • Explain organisational recommended procedure for storage of tools, equipment and material after completion of work. • Explain the ways to optimize usage of resources. • Discuss various methods of waste management and its disposal. • List the different categories of waste for	• Apply appropriate safety practices to ensure safety of people at the workplace • Display the correct way of wearing and removing PPE such as face masks, hand gloves, face shields, PPE suits, etc. • Demonstrate the use of fire extinguisher. • Apply basic first aid procedure in case of emergencies. • Perform routine cleaning of tools, equipment and machines. • Employ various techniques for checking malfunctions in the equipment as per Standard Operating Procedure (SOP). • Show how to sanitize and disinfect one's work area regularly. • Demonstrate the correct way of washing hands using soap and water. • Demonstrate the correct way of sanitizing hands using alcohol-based hand rubs. • Demonstrate how to evacuate the workplace in case of an emergency. • Demonstrate sorting of materials, tools and equipment and spare parts after completion of work. • Demonstrate the steps involved in storage of tools, equipment and material after completion of work. • Perform basic checks to identify any spills and leaks and that need to be plugged /stopped. • Demonstrate different disposal techniques depending upon types of waste. • Employ different ways to check if equipment/machines are functioning as per requirements and report malfunctioning, if observed. • Employ ways for efficient utilization of material and water.

the purpose of segregation • Differentiate between recyclable and non-recyclable waste • State the importance of using appropriate colour dustbins for different types of waste. • Discuss common practices for conserving electricity at workplace. • Discuss the common sources of pollution and ways to minimize it.	
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	
• Housekeeping material: Cleaning agents, cleaning cloth, waste container, dust pan and brush set, liquid soap, hand towel, fire extinguisher • Safety gears: Safety shoes, ear plug, goggles, gloves, helmet, first-aid kit	

Module 8

Module Name: Communicate Effectively and Efficiently

Mapped to ASC/N9802 v1.0

Terminal Outcomes:

- Use effective communication and interpersonal skills.
- Apply sensitivity while interacting with different genders and people with disabilities.

Duration: *<15:00>*	**Duration**: *<25:00>*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain the organizational structure for communicating with colleagues, seniors and others. • Discuss the ways to adjust the communication styles to reflect sensitivity towards gender and persons with disability (PwD). • Explain the importance of respecting personal space of colleagues. • State the procedure to receive work instructions and report problems to the supervisor. • List the various organizational policies and procedures to be followed at the workplace. • Describe different ways to rectify commonly occurring errors. • Explain the importance of complying with the instructions/guidelines and procedures while performing tasks related to the job specifications. • Discuss the importance of PwD and gender sensitization.	• Employ different means of communication depending upon the requirement while interacting with others. • Demonstrate using new ways to maintain good relationships with colleagues and supervisor. • Prepare a sample report to send the work status to the supervisor. • Demonstrate how to communicate with different genders and persons with disability (PwD) in a sensitive manner.
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	
Sample of escalation matrix, organisation structure.	

Module

Module Name: Prepare for welding operations

Mapped to ASC/N3101 v2.0

Terminal Outcomes:

- Identify tools and equipment required for welding operations.
- Perform the steps to carry out pre-welding activities such as lifting of workpiece, inspection of tools and equipment etc.

Duration: *<26:00>*	**Duration**: *<54:00>*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss basic principle of welding process. • Elucidate various types of welding (SMAW, MIG, MAG, TIG, Resistance Welding, Robotic Welding etc), welding joints and welding positions. • List tools, measuring instruments, equipment, accessories, consumables and input material required during welding work. • Discuss the organisational process of collecting and arranging tools, equipment, accessories, consumables, measuring instruments and input material from the store. • Summarise the steps to be performed for checking the input material, tools and equipment for any defects and quality standard • List the steps to be performed for installing the work pieces and fixture on the apparatus and aligning with the electrodes as per requirements. • Discuss the ways to handle the work pieces and machine auxiliaries safely while loading on the machine apparatus.	• Apply appropriate ways of checking the input material, tools and equipment for defects before use. • Demonstrate the standard operating procedure to use tools, equipment and measuring instruments required during job. • Demonstrate how to support the welding operator in installing the work pieces and fixture on the apparatus and aligning with the electrodes. • Show how to load the work pieces and machine auxiliaries safely on the machine manually or by using lifting equipment.
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	
• Basic tool box, Work bench with vice • Hammer scaling 0.25 kg. with handle, Hammer ball pin 1 kg. with handle, Chisel cold flat 19 mm, Chisel cold cross 9mm, Centre punch 9mm x 127mm, Dividers 20 cm, Wire brush 15 cm x 3.7 mm, Spark lighter, Chipping screen hand, Number punch 6 mm and letter punch 6 mm, Square blade 15 cm, Scriber 15 cm, Tongs holding • Brass rule 30 cm or nickel chrome steel rule 30 cm, Screw driver 25cm blade and 20 cm blade, Hacksaw frame adjustable 30 cm, Magnifying glass 15 cm, Weld measuring gauge fillet and	

butt, File half round bastard 30 cm, File flat 35 cm rough, Steel tape 182 cm flexible in case, Try square

- Rubber hose clips, Spindle key (for opening cylinder valve), Pressure regulator oxygen double stage, Pressure regulator acetylene regulator, Tip cleaner, Outfit spanner
- Power hacksaw, Portable grinder
- Power source, TIG welding set complete 300 amps with flexible coupling copper wound, Welding cables to carry 350 amps with flexible rubber copper, GMAW/MIG welding set, Spot / Butt welding set
- Dye penetrant test kit, Ultrasonic testing kit, Magnetic particle testing kit, X-ray testing kit
- Hand book, job orders, work order, completion material requests, and Technical Reference Books.
- Safety materials: Fire extinguisher, welding helmet, leather sleeves, leather safety gloves, leather aprons, safety glasses with side shields, ear plug, safety shoes and first-aid kit
- Cleaning material: Tip cleaner, wire brush (M.S.), cleaning agents, cleaning cloth, waste container, dust pan and brush set, liquid soap, hand towel

Module 5

Module Name: Support in welding and post-welding operations

Mapped to ASC/N3101 v2.0

Terminal Outcomes:

- Demonstrate how to support welding operator during welding operations.
- Perform the steps to carry out post-welding activities.

Duration: *<34:00>*	**Duration**: *<66:00>*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss the appropriate way of holding tools during the welding operations. • List consumables and accessories required during the welding work. • Describe finishing processes such as dimensions check, removing extra material, hammering workpiece into desired shape etc. as per the required specifications. • Discuss the process of unloading and placing the welded components on the designated place as per the work instructions. • Explain the process of checking the irregularities of welded input as per the specified quality standards. • Discuss the safety practices to be followed to avoid any hazard and accident during welding activities. • Discuss post welding processes like inspection, cleaning, maintenance etc. • Explain methods of inspecting the quality of welded workpieces. • Discuss the process of segregating, tagging and storing of damaged and ok workpieces as per organisational guidelines. • Discuss various cleaning methods to clean the tools, equipment, process auxiliaries and work area. • Recall organisational recommended procedure for storage of the tools, equipment and process auxiliaries after completion of work. • List different methods for disposing off waste material.	• Show how to hold the tools during welding operations in the correct manner and safely. • Apply appropriate ways to remove the extra material and bulges from the welded piece to get the desired shape as per the required specifications. • Perform the steps of unloading welded components from fixture and placing them on the designated place by using lifting tools. • Employ appropriate inspection methods to check the quality of welded workpieces. • Show how to segregate, tag and store the welded pieces as per organisational guidelines, in coordination with welding operator. • Apply appropriate cleaning methods to clean the tools, equipment and process after completion of work • Demonstrate the organisational procedure involved in storage of tools, equipment and process auxiliaries after completion of work. • Apply appropriate ways to remove chips from different machine areas and clean the work area. • Show how to dispose waste as per organisational guidelines.
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	

- Basic tool box, Work bench with vice
- Hammer scaling 0.25 kg. with handle, Hammer ball pin 1 kg. with handle, Chisel cold flat 19 mm, Chisel cold cross 9mm, Centre punch 9mm x 127mm, Dividers 20 cm, Wire brush 15 cm x 3.7 mm, Spark lighter, Chipping screen hand, Number punch 6 mm and letter punch 6 mm, Square blade 15 cm, Scriber 15 cm, Tongs holding
- Brass rule 30 cm or nickel chrome steel rule 30 cm, Screw driver 25cm blade and 20 cm blade, Hacksaw frame adjustable 30 cm, Magnifying glass 15 cm, Weld measuring gauge fillet and butt, File half round bastard 30 cm, File flat 35 cm rough, Steel tape 182 cm flexible in case, Try square
- Rubber hose clips, Spindle key (for opening cylinder valve), Pressure regulator oxygen double stage, Pressure regulator acetylene regulator, Tip cleaner, Outfit spanner
- Power hacksaw, Portable grinder
- Power source, TIG welding set complete 300 amps with flexible coupling copper wound, Welding cables to carry 350 amps with flexible rubber copper, GMAW/MIG welding set, Spot / Butt welding set
- Dye penetrant test kit, Ultrasonic testing kit, Magnetic particle testing kit, X-ray testing kit
- Hand book, job orders, work order, completion material requests, and Technical Reference Books.
- Safety materials: Fire extinguisher, welding helmet, Leather sleeves, leather safety gloves, leather aprons, safety glasses with side shields, ear plug, safety shoes and first-aid kit
- Cleaning material: Tip cleaner, wire brush (M.S.), cleaning agents, cleaning cloth, waste container, dust pan and brush set, liquid soap, hand towel

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
ITI	Welder	2	Welding	1	Welding	NA
ITI	Welder	3	Welding	0	Welding	NA
Certificate NSQF- Level 4	Automotive Welding Machine Technician	2	Welding	1	Welding	NA
Diploma	Mechanical/Automobile	1	Welding	1	Welding	NA
Diploma	Mechanical/Automobile	2	Welding	0	Welding	NA

Trainer Certification	
Domain Certification	**Platform Certification**
"Automotive Welding Machine Assistant, ASC/Q3101, version 2.0". Minimum accepted score is 80%.	"Trainer, MEP/Q2601 v1.0" Minimum accepted score is 80%.

Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training/Assessment Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
ITI	Welder	3	Welding	1	Welding	NA
ITI	Welder	4	Welding	0	Welding	NA
Certificate NSQF- Level 4	Automotive Welding Machine Technician	3	Welding	1	Welding	NA
Diploma	Mechanical/Automobile	2	Welding	1	Welding	NA
Diploma	Mechanical/Automobile	3	Welding	0	Welding	NA

Assessor Certification	
Domain Certification	**Platform Certification**
"Automotive Welding Machine Assistant, ASC/Q3101, version 2.0". Minimum accepted score is 80%.	"Assessor; MEP/Q2701 v1.0" Minimum accepted score is 80%.

`

Assessment Strategy

1. Assessment System Overview:
    - Batches assigned to the assessment agencies for conducting the assessment on SDMS/SIP or email
    - Assessment agencies send the assessment confirmation to VTP/TC looping SSC
    - Assessment agency deploys the ToA certified Assessor for executing the assessment
    - SSC monitors the assessment process & records

2. Testing Environment:
    - Confirm that the centre is available at the same address as mentioned on SDMS or SIP
    - Check the duration of the training.
    - Check the Assessment Start and End time to be as 10 a.m. and 5 p.m.
    - If the batch size is more than 30, then there should be 2 Assessors.
    - Check that the allotted time to the candidates to complete Theory & Practical Assessment is correct.
    - Check the mode of assessment—Online (TAB/Computer) or Offline (OMR/PP).
    - Confirm the number of TABs on the ground are correct to execute the Assessment smoothly.
    - Check the availability of the Lab Equipment for the particular Job Role.

3. Assessment Quality Assurance levels / Framework:
    - Question papers created by the Subject Matter Experts (SME)
    - Question papers created by the SME verified by the other subject Matter Experts
    - Questions are mapped with NOS and PC
    - Question papers are prepared considering that level 1 to 3 are for the unskilled & semi-skilled individuals, and level 4 and above are for the skilled, supervisor & higher management
    - Assessor must be ToA certified & trainer must be ToT Certified
    - Assessment agency must follow the assessment guidelines to conduct the assessment

4. Types of evidence or evidence-gathering protocol:
    - Time-stamped & geotagged reporting of the assessor from assessment location
    - Centre photographs with signboards and scheme specific branding
    - Biometric or manual attendance sheet (stamped by TP) of the trainees during the training period
    - Time-stamped & geotagged assessment (Theory + Viva + Practical) photographs & videos

5. Method of verification or validation:
    - Surprise visit to the assessment location
    - Random audit of the batch
    - Random audit of any candidate

6. Method for assessment documentation, archiving, and access
    - Hard copies of the documents are stored
    - Soft copies of the documents & photographs of the assessment are uploaded / accessed from Cloud Storage
    - Soft copies of the documents & photographs of the assessment are stored in the Hard Drives

References

Glossary

Term	Description
Declarative Knowledge	Declarative knowledge refers to facts, concepts and principles that need to be known and/or understood in order to accomplish a task or to solve a problem.
Key Learning Outcome	Key learning outcome is the statement of what a learner needs to know, understand and be able to do in order to achieve the terminal outcomes. A set of key learning outcomes will make up the training outcomes. Training outcome is specified in terms of knowledge, understanding (theory) and skills (practical application).
OJT (M)	On-the-job training (Mandatory); trainees are mandated to complete specified hours of training on site
OJT (R)	On-the-job training (Recommended); trainees are recommended the specified hours of training on site
Procedural Knowledge	Procedural knowledge addresses how to do something, or how to perform a task. It is the ability to work, or produce a tangible work output by applying cognitive, affective or psychomotor skills.
Training Outcome	Training outcome is a statement of what a learner will know, understand and be able to do upon the completion of the training.
Terminal Outcome	Terminal outcome is a statement of what a learner will know, understand and be able to do upon the completion of a module. A set of terminal outcomes help to achieve the training outcome.

Acronyms and Abbreviations

NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
QP	Qualifications Pack
TVET	Technical and Vocational Education and Training
SOP	Standard Operating Procedure
WI	Work Instructions
PPE	Personal Protective equipment