

Model Curriculum

Repair Welder

SECTOR: AUTOMOTIVE
SUB-SECTOR: NON-FORMAL
OCCUPATION: AUTO COMPONENTS / AGGREGATES REPAIR
REF ID: ASC/Q1902, V1.0
NSQF LEVEL: 4



Certificate
CURRICULUM COMPLIANCE TO
QUALIFICATION PACK - NATIONAL OCCUPATIONAL
STANDARDS

is hereby issued by the

AUTOMOTIVE SKILLS DEVELOPMENT COUNCIL

for

MODEL CURRICULUM

Complying to National Occupational Standards of
Job Role/Qualification Pack "Repair Welder" QP No: "ASC/Q1902 Level 4"

Date of Issuance: February 12th, 2019

Valid up to: February 11th, 2021*

*Valid up to the next review date of the Qualification Pack


Authorised Signatory
(Automotive Skills Development Council)

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Repair Welder

CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of a “**Repair Welder**”, in the “**Automotive**” Sector/ Industry and aims at building the following key competencies amongst the learner

Program Name	Repair Welder		
Qualification Pack Name & Reference ID	ASC/Q1902, v1.0		
Version No.	1.0	Version Update Date	24 th April 2019
Pre-requisites to Training	Class VIII		
Training Outcomes	<p>After completing this programme, participants will be able to:</p> <ul style="list-style-type: none"> • Identify necessary tools and equipment required for welding processes. • Carry out fabrication and repairing of components/sub-assemblies through welding. • Maintain quality standards and manage organizational resources efficiently and effectively. • Follow organizational policies and procedures • Follow prevailing environmental norms, government policies and work to eliminate common breaches in health and safety. 		

This course encompasses 4 out of 4 National Occupational Standards (NOS) of “**Repair Welder**” Qualification Pack issued by “**Automotive Skills Development Council**”.

Sr. No.	Module	Key Learning Outcomes	Equipment Required
1	<p>Introduction</p> <p>Theory Duration (hh:mm) 10:00</p> <p>Practical Duration (hh:mm) 00:00</p> <p>Corresponding NOS Code Bridge Module</p>	<ul style="list-style-type: none"> List OEMs and different products/models manufactured by them. Describe service process of an automotive workshop List roles and responsibilities of a Repair welder. List job opportunities for a Repair welder. 	
2	<p>Understand requirements related to welding</p> <p>Theory Duration (hh:mm) 30:00</p> <p>Practical Duration (hh:mm) 60:00</p> <p>Corresponding NOS Code ASC/N1902</p>	<ul style="list-style-type: none"> Identify raw material for welding on vehicle. Demonstrate various welding techniques and processes such as <ul style="list-style-type: none"> gas metal arc welding tungsten inert gas welding oxy acetylene welding arc welding resistance welding solid state welding plasma arc welding Support shielded and electric arc welders in setting up and adjustment of welding equipment. Demonstrate operation of manual/semi-automatic welding equipment to fuse metal segments. Carry out lay outting, positioning and assembling of parts according to specifications. Create list of hand tools, power tools and measuring equipment required for the work. Identify necessary machine, equipment and accessories required for welding work. Carry out inspection of equipment, structures, or materials to identify the cause of errors or other problems. Perform tack-welding of components and assemblies. 	<p>Welding table, Fitting work bench, Bench vice, Work pieces</p> <p>Equipment: MIG Welding set, Arc welding set, Spot welding set, Oxy-acetylene welding setting welding set, welding torch, soldering and brazing equipment</p> <p>Measuring Tools: Steel tape, Steel rule, try square, Combination square, Vernier calliper, Micrometre, Dividers, Weighing scales, Sheet metal Gauges.</p> <p>Cutting Tools: Hacksaw frame adjustable, Flat file, Square file, Round file, Half-round file, Triangular file, Cold chisel, Scraper, Punches.</p> <p>Driving Tools: Chipping hammer, Ball peen hammer, Adjustable Wrench, Screw driver set, Allen key, Spanner set, Spindle key</p> <p>Holding Tools: C-clamp, Hand vice, Tong, Pliers</p> <p>Safety Materials: Fire extinguisher, Portable welding curtains, Leather safety gloves, leather aprons, safety glasses</p>

Sr. No.	Module	Key Learning Outcomes	Equipment Required
			<p>with side shields, Ear Plug, Welding respirator, Screen welding helmet type with filter glasses, Safety Shoe and First aid kit</p> <p>Cleaning material and other tools: Tip cleaner, Wire brush (M.S.), Cleaning agents, Cleaning cloth, Waste container, Dust pan, brush set, Liquid soap, Hand towel</p>
3	<p>Perform and finish all assigned jobs related to welding</p> <p>Theory Duration (hh:mm) 45:00</p> <p>Practical Duration (hh:mm) 85:00</p> <p>Corresponding NOS Code ASC/N1902</p>	<ul style="list-style-type: none"> List hand tools, power tools and measuring equipment required for the work. Demonstrate cutting of workpieces by power saws, hand shears and chipping knife. Examine welded surfaces for dimension tolerance to evaluate weld quality and specifications. Examine fitting, burning, and welding processes to avoid overheating of parts. Carry out inspection of grooves, angles and gap allowances in workpieces by using measuring instrument. Demonstrate use of portable grinder, hand file, or scraper for removing rough spots from work piece. Demonstrate welding of components in flat, vertical or overhead positions. Support team in examining the finish products and spare parts with the standard samples. Follow safety procedures as described in Standard Operation Procedures (SOP). 	<p>Welding table, Fitting work bench, Bench vice, Work pieces</p> <p>Equipment: MIG Welding set, Arc welding set, Spot welding set, Oxy-acetylene welding setting welding set, welding torch, soldering and brazing equipment</p> <p>Measuring Tools: Steel tape, Steel rule, try square, Combination square, Vernier calliper, Micrometer, Dividers, Weighing scales, Sheet metal Gauges.</p> <p>Cutting Tools: Hacksaw frame adjustable, Flat file, Square file, Round file, Half-round file, Triangular file, Cold chisel, Scraper, Punches.</p> <p>Driving Tools: Chipping hammer, Ball peen hammer, Adjustable Wrench, Screw driver set, Allen key, Spanner set, Spindle key</p> <p>Holding Tools: C-clamp, Hand vice, Tong, Pliers</p> <p>Safety Materials: Fire extinguisher, Portable welding curtains, Leather safety gloves, leather aprons, safety glasses with side shields, Ear Plug, Welding respirator,</p>

Sr. No.	Module	Key Learning Outcomes	Equipment Required
			Screen welding helmet type with filter glasses, Safety Shoe and First aid kit Cleaning material and other tools: Tip cleaner, Wire brush (M.S.), Cleaning agents, Cleaning cloth, Waste container, Dust pan, brush set, Liquid soap, Hand towel
4	<p>Plan and organize work to meet expected outcomes</p> <p>Theory Duration (hh:mm) 20:00</p> <p>Practical Duration (hh:mm) 30:00</p> <p>Corresponding NOS Code ASC/N0001</p>	<ul style="list-style-type: none"> Perform the job within given time as per quality standards/ work schedule Identify and manage resources to use them efficiently and effectively Adhere to organizational policies and Standard operating procedures Manage time effectively at work place Execute best practices to keep workplace clean Summarise knowledge and understanding required for planning and organizing. 	5S literature and Case studies
5	<p>Work effectively in a team</p> <p>Theory Duration (hh:mm) 20:00</p> <p>Practical Duration (hh:mm) 40:00</p> <p>Corresponding NOS Code ASC/N0002</p>	<ul style="list-style-type: none"> Demonstrate effective ways of interaction and communication at workplace List all forms of verbal and non-verbal methods of communication Describe methods to judge customer based on their body language Demonstrate grooming skills applicable at workplace Demonstrate business etiquette at workplace. Demonstrate appropriate usage of resources and material at workplace 	Case studies
6	<p>Maintain a Healthy, Safe and Secure working environment</p> <p>Theory Duration (hh:mm) 25:00</p> <p>Practical Duration</p>	<ul style="list-style-type: none"> Identify various types of hazards at workplace Practice 5S for appropriate setting of workplace Demonstrate best practices to remove potential hazards at the workplace and prevent accidents Describe appropriate strategies to deal with emergencies and accidents such 	5S literature and charts Fire extinguisher, First-aid kit

Sr. No.	Module	Key Learning Outcomes	Equipment Required
	(hh:mm) 35:00 Corresponding NOS Code ASC/N0003	as fires and natural calamities at the workplace • Demonstrate usage of fire-fighting equipment available at workplace	
	Total Duration Theory Duration (hh:mm) 150:00 Practical Duration (hh:mm) 250:00	Unique Equipment Required: <ul style="list-style-type: none"> • Welding table, Fitting work bench, Bench vice, Work pieces • Equipment: MIG Welding set, Arc welding set, Spot welding set, Oxy-acetylene welding setting welding set, welding torch, soldering and brazing equipment. • Measuring Tools: Steel tape, Steel rule, try square, Combination square, Vernier calliper, Micrometre, Dividers, Weighing scales. • Cutting Tools: Hacksaw frame adjustable, Flat file, Square file, Round file, Half-round file, Triangular file, Cold chisel, Scraper, Punches. • Driving Tools: Chipping hammer, Ball peen hammer, Adjustable Wrench, Screw driver set, Allen key, Spanner set, Spindle key • Holding Tools: C-clamp, Hand vice, Tong, Pliers • Safety Materials: Fire extinguisher, Portable welding curtains, Leather safety gloves, leather aprons, safety glasses with side shields, Ear Plug, Welding respirator, Screen welding helmet type with filter glasses, Safety Shoe and First aid kit. • Cleaning material and other tools: Tip cleaner, Wire brush (M.S.), Cleaning agents, Cleaning cloth, Waste container, Dust pan, brush set, Liquid soap, Hand towel. 	

Grand Total Course Duration: **400 Hours, 0 Minutes**

(This syllabus/ curriculum has been approved by [Automotive Skills Development Council](#))

Trainer Prerequisites for Job role: “Repair Welder” mapped to Qualification Pack: “ASC/Q1902, Version 1.0”

S. No.	Area	Details
1	Description	To deliver accredited training service, mapping to the curriculum detailed above, in accordance with the Qualification Pack “ <u>ASC/Q1902, Version 1.0</u> ”.
2	Personal Attributes	<ul style="list-style-type: none"> • Aptitude for conducting training, and pre/ post work to ensure competent, employable candidates at the end of the training. • Strong communication and interpersonal skills; ability to work as part of a team; passion for quality and for developing others; well organized and focused. • Eager to learn and keep oneself abreast of the latest developments and newer technologies used in the various systems of vehicles and their aggregates. • Should be able to demonstrate the usage of workshop equipment, instruments, special instruments and tools. • Should have sharp diagnostic abilities for identifying reasons of problems in vehicles and troubleshoot them accordingly. • Should be hands-on with welding practices to provide actual training.
3	Minimum Educational Qualifications	ITI in Welder Trade/ Motor Mechanic/ Diesel Mechanic diploma in Automobile/Mechanical
4a	Domain Certification	Certified for Job Role: “ <u>Repair Welder</u> ” mapped to QP: <u>ASC/Q1902, v1.0</u> . Minimum qualifying score - 80%, as per ASDC guidelines.
4b	Platform Certification	Recommended that the Trainer is certified for the Job Role: “ <u>Trainer</u> ”, mapped to the Qualification Pack: “ <u>MEP/Q2601</u> ”. Minimum accepted score as per ASDC guidelines is 80%.
5	Experience	4 Years for ITI and 3 years for diploma holder hands on experience in welding

Annexure: Assessment Criteria

Assessment Criteria	
Job Role	Repair Welder
Qualification Pack	ASC/Q1902, v1.0
Sector Skill Council	Automotive

Sr. No.	Guidelines for Assessment
1	Assessment to be conducted by ASDC as per competency output defined in the NOS/QP and the assessment criteria provided in the NOS/QP
2	Assessment to be carried out by a third- party assessment body duly affiliated to the SSC.
3	ASDC assessments will be comprehensive and cover all aspects of acquired knowledge, practical skills and basic ability to communicate. Accordingly, evaluation process would include: <ol style="list-style-type: none"> Theory/Knowledge test Practical demonstration test Face to Face Viva-Voice
4	Theory/Knowledge assessment will be carried out on line through a link provided for each assessment that generates a random paper from a bank of questions available at the back end. <ul style="list-style-type: none"> Exception to an online test in favour of Paper Test would be subject to non- availability of requisite broad band and/or hardware. On line test would be conducted in the presence of an ASDC assessor till web-enabled proctoring is deployed.
5	ASDC assessor would be conducting Practical and Viva as per the criteria provided in the NOS/QP.
6	Cut off criteria for certification (Marks obtained in 70%)

Assessment Outcomes	Assessment Criteria for Outcomes	Total Marks	Out Of	Theory	Skills Practical
ASC/N1902 Perform all jobs assigned related to welding	PC1. Determine required equipment and welding method to be used to weld a component/aggregate	100	4	1	3
	PC2. Identify the different material specifications required to repair the weld joints		4	1	3
	PC3. Assist in setting up or adjusting necessary equipment, such as shielded and electric arc welders and maintenance or other welding related machines		5	1	4
	PC4. Operate manual or semi-automatic welding equipment to fuse metal segments, using processes such as gas tungsten arc, gas metal arc, flux-cored arc, plasma arc, shielded metal arc, resistance welding, and submerged arc welding		5	1	4

PC5. Operate manual and automated welding units and equipment by depositing metal from electrode to work piece and joining edges of work piece	6	2	4
PC6. Layout, position, and secure parts and assemblies according to specifications, using straightedge, combination square, callipers, and ruler	6	2	4
PC7. Tack-weld or weld components and assemblies, using electric, gas, arc, or other welding equipment	6	2	4
PC8. Cut work piece, using powered saws, hand shears, or chipping knife	6	2	4
PC9. Melt lead bar, wire, or scrap to add lead to joint or to extrude melted scrap into reusable form	6	2	4
PC10. Observe tests on welded surfaces, like dimension tolerance to evaluate weld quality and conformance to specifications	6	2	4
PC11. Monitor the fitting, burning, and welding processes to avoid overheating of parts or warping, shrinking, distortion, or expansion of material	6	2	4
PC12. Inspect grooves, angles, or gap allowances, using micro-meter, calliper, and precision measuring instrument	6	2	4
PC13. Remove rough spots from work piece, using portable grinder, hand file, or scraper	6	2	4
PC14. Weld components in flat, vertical, or overhead position.	5	2	3
PC15. Heat, form, and dress metal parts, using hand tools, torch, or arc welding equipment.	6	2	4
PC16. Ignite torch and adjust valves, amperage, or voltage to obtain desired flame or arc	5	1	4
PC17. Weld defect free weld joint and weld repair	4	1	3
PC18. Assist in examining finish products and spare parts and comparing them with samples to check whether the specifications are met	4	1	3
PC19. Ensure that all safety procedures	4	1	3

	are followed by using protective equipment like eye shields, nose masks etc.				
		Total	100	30	70
ASC/N 0001 Plan and organize work to meet expected outcome	PC1. Keep immediate work area clean and tidy	100	9	2	7
	PC2. Treat confidential information as per the organisation's guidelines		9	2	7
	PC3. Work in line with organisation's policies and procedures		12	4	8
	PC4. Work within the limits of job role		12	4	8
	PC5. Obtain guidance from appropriate people, where necessary		12	4	8
	PC6. Ensure work meets the agreed requirements		13	4	9
	PC7. Establish and agree on work requirements with appropriate people		13	4	9
	PC8. Manage time, materials and cost effectively		10	3	7
	PC9. Use resources in a responsible manner		10	3	7
		Total	100	30	70
ASC/N 0002 Work effectively in a team	PC1. Maintain clear communication with colleagues (including face-to-face, telephonic as well as written)	100	10	3	7
	PC2. Work with colleagues to integrate work		13	4	9
	PC3. Pass on information to colleagues in line with organisational requirements both through verbal as well as non-verbal means		13	4	9
	PC4. Work in ways that show respect for colleagues		14	4	10
	PC5. Carry out commitments made to colleagues		14	4	10
	PC6. Let colleagues know in good time if cannot carry out commitments, explaining the reasons		13	4	9
	PC7. Identify problems in working with colleagues and take the initiative to solve these problems		13	4	9
	PC8. Follow the organisation's policies and procedures for working with colleagues		10	3	7
		Total	100	30	70

ASC/N 0003 Maintain safe, healthy environment friendly workplace	PC1. Comply with organisation's current health, safety and security policies and procedures	100	10	3	7
	PC2. Report any identified breaches in health, safety, and security policies and procedures to the designated person		13	4	9
	PC3. Coordinate with other resources at the workplace to achieve the healthy, safe and secure environment for all incorporating all government norms esp. for emergency situations like fires, earthquakes etc.		13	4	9
	PC4. Identify and correct any hazards like illness, accidents, fires or any other natural calamity safely and within the limits of individual's authority		14	4	10
	PC5. Report any hazards outside the individual's authority to the relevant person in line with organisational procedures and warn other people who may be affected		14	4	10
	PC6. Follow organisation's emergency procedures for accidents, fires or any other natural calamity		13	4	9
	PC7. Identify and recommend opportunities for improving health, safety, and security to the designated person		13	4	9
	PC8. Complete all health and safety records are updates and procedures well defined		10	3	7
	Total		100	30	70
	Grand Total		400	120	280
	Percentage Weightage:			30%	70%
	Minimum Pass % to qualify (aggregate):			70%	