AUTO ELECTRICIAN

Assessment Package

National Vocational Certificate Level 2

Version 1 - March 2014

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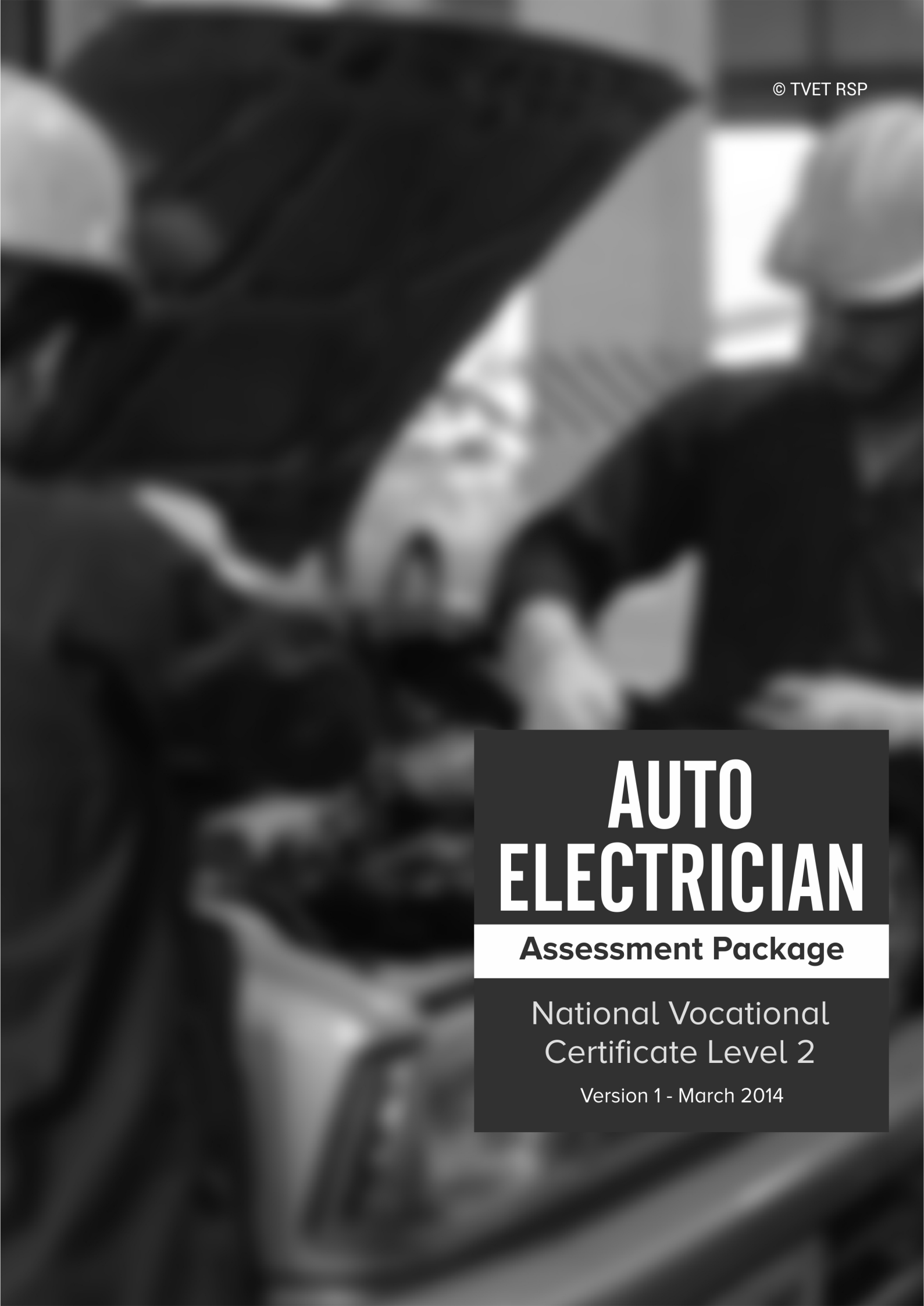

AUTO ELECTRICIAN

Assessment Package

National Vocational Certificate Level 2

Version 1 - March 2014

ASSESSMENT MATERIAL

EVIDENCE GUIDE

Qualification
Auto Electrician
CS Code:
Level: 2
Credit: 8
Version: 1

REPAIR LIGHTING SYSTEM OF THE VEHICLE

CONTENTS

ASSESSMENT AND ASSESSOR DETAILS

Competent ☐ **Not Yet Competent** ☐

Assessment ☐ Re-Assessment ☐

Assessor's Name ..... Assessor's Code .....

Assessor's Signature ..... Date ☐☐☐☐☐☐☐☐ (DD MM YYYY)

CANDIDATE DETAILS

Candidate's Name ..... (First Name / Last Name)

Father's Name .....

Institute Name and District .....

CNIC/BFORM # ☐☐☐☐☐☐☐☐☐☐☐☐☐

Registration Number issued by Assessment Body .....

Gender Male ☐ Female ☐ Transgender ☐

Candidate's Consent I agree to the time and date of the assessment and am aware of the requirements of the assessment. I fully understand my rights of appeal.

Candidate's Signature .....

ASSESSMENT RESULTS SUMMARY FORM

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NAVTTC OFFICE ONLY

1. DATE FORM RECEIVED: ☐☐☐☐☐☐☐☐ (DD MM YYYY)

2. DATE ENTERED INTO DATABASE: ☐☐☐☐☐☐☐☐ (DD MM YYYY)

1 ASSESSMENT SUMMARY & RECORD

ACTIVITY	METHOD				DESIRED OUTCOMES	RESULT	
NATURE OF ACTIVITY	WRITTEN	ORAL	PORTFOLIO	OBSERVATION	DESIRED OUTCOMES FOR SUCCESSFUL ASSESSMENT OF COMPETENCY STANDARD: PREPARE TO CARRY OUT HVAC WORK	COMPETENT	NOT YET COMPETENT
Practical Skill Demonstration				✓	• Diagnose faults in the lighting system of the vehicle. • Replace head light bulbs of the vehicle. • Replace Indicator light bulbs of the vehicle. • Align the head light of vehicle.		
Knowledge Assessment	✓	✓			• Answer all questions your Assessor may have during the practical assessment.		
Other Requirements			✓		• NA		

2 CANDIDATE ASSESSMENT

Candidate's Name…….... Father's Name ……..

ALL WORK ASSESSED IN THIS COMPETENCY STANDARD MUST BE YOUR OWN WORK.

GUIDANCE TO CANDIDATE

To meet this standard you are required to complete the following tasks within **three and half hours** timeframe:

- Diagnose faults in the lighting system of the vehicle.
- Replace head light bulbs of the vehicle.
- Replace Indicator light bulbs of the vehicle.
- Align the head light of vehicle.

ACTIVITIES	CANDIDATE RESPONSE
1. Complete practical task of repair lighting system of the vehicle observation by an assessor	During a practical assessment, under observation by an assessor, I will correctly : • Diagnose faults in the lighting system of the vehicle. ✓ Place fender cover on both sides of the vehicle's fenders ✓ Check and tight the battery terminals of the vehicle with spanner ✓ Check and clean the deposits of sulphate on the vehicle's battery terminals with wire brush/soda water ✓ Measure the vehicle's battery terminal voltage by using Volt Meter. ✓ Check and replace the blown fuses of the lighting circuit of the vehicle. ✓ Check the wiring harness of the lighting system of the vehicle with a Test Lamp/Multi Metre. ✓ Repair/replace the faulty wires of vehicle's lighting system. ✓ Repair/replace and clean the connectors, thimbles and jacks of the lighting system. ✓ Check indicator assembly with Test Lamp/Multi Meter of vehicle, for switching outputs of lighting system. ✓ Repair/replace faulty indicator assembly of vehicle's lighting system. ✓ Replace/repair/clean bulb holders of vehicle's lighting system if rusted or damaged. ✓ Replace fused bulbs of vehicle's lighting system. • Replace headlight bulbs of the vehicle ✓ Remove dust caps, connectors and bulb holders from vehicle's headlight hosing and remove bulbs from the holders. ✓ Clean dust caps, connectors and bulb holders of the headlight with rust cleaner/sand paper/cotton waste. ✓ Place new bulbs in the holders of the headlight of the vehicle ✓ Fit and connect the bulb holders, bulb connectors and dust caps in the headlights hosing of the vehicle's headlights. • Repair and replace the tail light assembly of the vehicle. ✓ Check battery connections of the vehicle and tight the battery connections with spanners. ✓ Check all fuses of tail light assembly of the vehicle with Test Lamp/Multi Meter ✓ Replace the blown fuses of tail light assembly of the vehicle. ✓ Check the brake system and reverse gear switches of the vehicle with Multi Meter/Tester Lamp ✓ Replace the faulty brake and reverse gear switches of the vehicle's tail light assembly. ✓ Check the wiring harness of vehicle's tail light assembly with Test Lamp/Multi Meter ✓ Repair/replace broken and naked wires, connectors and thimbles of vehicle's tail light assembly. ✓ Replace/repair/clean bulb holders of vehicle's tail lighting system if rusted or damaged. • Align the head lights of the vehicle. ✓ Park the vehicle on a level surface in front of a vertical wall/garage door

	✓ Use the masking tape to mark the low-beams horizontal centrelines of the vehicle' headlight on the wall ✓ Use the masking tape to mark the low-beams vertical centrelines of the vehicle' headlight on the wall. ✓ Use the masking tape to mark the vehicle centreline to determine side to-side alignment of the headlights. ✓ Move the vehicle 25 feet straight backwards from the wall for the alignment of the headlights of the vehicle. ✓ Turn the horizontal adjusting screws of the headlights to position the headlights' low beam hot spots two inches below from the taped horizontal centrelines. ✓ Turn the vertical adjusting screws of the headlights to position the headlights' low beam hot spots two inches right from the taped vertical centrelines. ✓ Adjust high-beam hot spots of the headlights below the horizontal centrelines and slightly to the inside of both the headlights beams horizontal centrelines relative to the vehicle centreline.
2. Other requirements	• NA
3. Answer any questions your assessor may have during the practical assessment	My answers to questions are correct and demonstrate my understanding of the topics and their application.

3 ASSESSOR JUDGEMENT GUIDE

Candidate's Name …… Father's Name……

INSTRUCTIONS FOR ASSESSOR	This section contains minimum evidence requirements. Oral questioning may be used to clarify candidate understanding of the topic and its application.

ACTIVITIES	MINIMUM EVIDENCE REQUIRED	YES	NO	ASSESSOR COMMENTS
1. Complete practical task of repair lighting system of the vehicle observation by an assessor	During a practical assessment, under observation by an assessor, the candidate correctly carried out the following tasks:			
Diagnose faults in the lighting system of the vehicle.	Placed fender cover on both sides of the vehicle's fenders			
	Checked and tightened the battery terminals of the vehicle with spanner			
	Checked and cleaned the deposits of sulphate on the vehicle's battery terminals with wire brush/soda water			
	Measured the vehicle's battery terminal voltage by using Volt Meter.			
	Checked and replaced the blown fuses of the lighting circuit of the vehicle.			
	Checked the wiring harness of the lighting system of the vehicle with a Test Lamp/Multi Metre.			
	Repaired/replaced the faulty wires of vehicle's lighting system.			
	Repaired/replaced and cleaned the connectors, thimbles and jacks of the lighting system.			
	Checked indicator assembly with Test Lamp/Multi Meter of vehicle, for switching outputs of lighting system.			
	Repaired/replaced faulty indicator assembly of vehicle's lighting system.			
	Replaced/repaired/cleaned bulb holders of vehicle's lighting system if rusted or damaged.			
	Replaced fused bulbs of vehicle's lighting system.			
Replace headlight bulbs of the vehicle	Removed dust caps, connectors and bulb holders from vehicle's headlight hosing and remove bulbs from the holders.			
	Cleaned dust caps, connectors and bulb holders of the headlight with rust cleaner/sand paper/cotton waste.			
	Placed new bulbs in the holders of the headlight of the vehicle			
	Fitted and connected the bulb holders, bulb connectors and dust caps in the headlights hosing of the vehicle's headlights.			
Repair and replace the tail light assembly of the vehicle.	Checked battery connections of the vehicle and tight the battery connections with spanners.			
	Checked all fuses of tail light assembly of the vehicle with Test Lamp/Multi Meter			
	Replaced the blown fuses of tail light assembly of the vehicle.			
	Checked the brake system and reverse gear switches of the vehicle with Multi Meter/Tester Lamp.			
	Replaced the faulty brake and reverse gear switches of the vehicle's tail light assembly.			

	Checked the wiring harness of vehicle's tail light assembly with Test Lamp/Multi Meter			
	Repaired/replaced broken and naked wires, connectors and thimbles of vehicle's tail light assembly.			
	Replaced/repaired/cleaned bulb holders of vehicle's tail lighting system if rusted or damaged.			
Align the head lights of the vehicle.	Parked the vehicle on a level surface in front of a vertical wall/garage door			
	Used the masking tape to mark the low-beams vertical centrelines of the vehicle' headlight on the wall.			
	Used the masking tape to mark the vehicle centreline to determine side to-side alignment of the headlights.			
	Moved the vehicle 25 feet straight backwards from the wall for the alignment of the headlights of the vehicle.			
	Turned the horizontal adjusting screws of the headlights to position the headlights' low beam hot spots two inches below from the taped horizontal centrelines.			
	Turned the vertical adjusting screws of the headlights to position the headlights' low beam hot spots two inches right from the taped vertical centrelines.			
	Adjusted high beam hot spots of the headlights below the horizontal centrelines and slightly to the inside of both the headlights beams horizontal centrelines relative to the vehicle centreline.			
2. Other requirements	[All other requirements related to the Assessment]			
3. Answer any questions the assessor may have during the practical assessment	Candidate's answers to questions are correct and demonstrate understanding of the topics and their application. Assessor to document below all questions asked and candidate answers. Use extra sheets if required and attach.			

4 LIST OF TOOLS, EQUIPMENT, MATERIAL AND CONTEXT OF ASSESSMENT

INSTRUCTIONS	This section contains information regarding; • Context of the assessment • List of required tools and equipment. • List of consumable items required during the service
1. Context of Assessment	This task will be performed in **real time** environment.

2. List of tools and equipment required (for five candidates)		
S. No	**Items**	**Quantity**
1	Personal protective equipment (PPE)	5
2	Complete tool kit	5
3	Multi Meter	5
4	Repair manual of vehicle	1
5	Test lamp	5
6	Wire brush	5

3. List of consumable items required (for five candidates)		
S. No	**Items**	**Quantity**
1	Insulation tape	1
2	Sand paper	2
3	Wires	1 roll
4	Bulbs	10
5	Bulb holders	10
6	Fasteners different	20
7	Masking tape	5

ASSESSMENT MATERIAL **EVIDENCE GUIDE**	**TEST BATTERY PERFORMANCE**
Qualification Auto Electrician **CS Code**: **Level**: 2 **Credit**: 10 **Version**: 1	

CONTENTS

ASSESSMENT AND ASSESSOR DETAILS

Competent	☐	**Not Yet Competent**	☐
Assessment	☐	Re-Assessment	☐

Assessor's Name ..... Assessor's Code .....

Assessor's Signature ..... Date ☐☐☐☐☐☐☐☐ (DD MM YYYY)

CANDIDATE DETAILS

Candidate's Name ..... (First Name / Last Name)

Father's Name .....

Institute Name and District .....

CNIC/BFORM # ☐☐☐☐☐☐☐☐☐☐☐☐☐

Registration Number issued by Assessment Body .....

Gender ..... Male ☐ Female ☐ Transgender ☐

Candidate's Consent: I agree to the time and date of the assessment and am aware of the requirements of the assessment. I fully understand my rights of appeal.

Candidate's Signature .....

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1 ASSESSMENT SUMMARY & RECORD

ACTIVITY	METHOD				DESIRED OUTCOMES	RESULT	
NATURE OF ACTIVITY	WRITTEN	ORAL	PORTFOLIO	OBSERVATION	DESIRED OUTCOMES FOR SUCCESSFUL ASSESSMENT OF COMPETENCY STANDARD: SERVICE THE BATTERY OF VEHICLE	COMPETENT	NOT YET COMPETENT
Practical Skill Demonstration				✓	• Test vehicle lead acid battery performance		
Knowledge Assessment	✓	✓			• Answer all questions your Assessor may have during the practical assessment.		
Other Requirements			✓		• [List all other requirements]		

2 CANDIDATE ASSESSMENT

Candidate's Name…….... Father's Name ……..

ALL WORK ASSESSED IN THIS COMPETENCY STANDARD MUST BE YOUR OWN WORK.

GUIDANCE TO CANDIDATE

To meet this standard you are required to complete the following tasks within **4 hours** timeframe:

- Remove battery from vehicle and inspect the electrolyte of the battery
- Perform load test after charging and refit the battery in the vehicle

ACTIVITIES	CANDIDATE RESPONSE
1. Complete practical task of testing battery performance under observation by an assessor	During a practical assessment, under observation by an assessor, I will correctly : • Remove battery from vehicle and inspect the electrolyte of the battery ✓ Remove the -ve battery terminal first and then remove the +ve battery terminal with spanner ✓ Remove the vehicle's battery clamp with spanner ✓ Check and clean the deposits of sulphate on the vehicle's battery terminals with wire brush/soda water. ✓ Check the electrolyte level in vehicle's battery according to Visual Fill Levels mentioned on vehicle's battery container ✓ Top up vehicle's battery electrolyte level with distilled water according to Visual Fill Levels mentioned on vehicle's battery container. ✓ Check the specific gravity of electrolyte of vehicle's battery as per battery service manual. ✓ Inspect the vehicle's battery vent plug holes for chocking and clean the vent holes of vehicle's battery with poker. • Perform load test after charging and refit the battery in the vehicle ✓ Measure the vehicle's battery voltage with Volt Meter/Multi Meter as per vehicle service manual. ✓ Check the vehicle's battery capacity in Ampere Hour (AH) mentioned on vehicle's battery container. ✓ Set the charging current in amperes on vehicle's battery charger according to battery capacity in Ampere Hour (AH) and connect the vehicle's battery to vehicle's battery charger. ✓ Check the specific gravity of vehicle's battery during the charging process with Hydro Meter ✓ Disconnect the vehicle's battery from the battery charger if specific gravity meets the service manual standards. ✓ Connect the vehicle's battery to Battery Load Tester and check the vehicle's battery condition for good, weak or bad on the screen of Battery Load Tester. ✓ Replace the vehicle's battery if found bad during battery load test. ✓ Place the vehicle battery in vehicle on battery mounting and fix the battery clamp with spanner. ✓ Connect and tight the +ve terminal first then connect and tight the -ve battery terminal with spanners. ✓ Apply mineral jelly/grease on battery terminals to prevent the battery terminals from sulphating.
2. Other requirements	• NA]
3. Answer any questions your assessor may have during the practical assessment	My answers to questions are correct and demonstrate my understanding of the topics and their application.

3 ASSESSOR JUDGEMENT GUIDE

Candidate's Name …… Father's Name……

INSTRUCTIONS FOR ASSESSOR	This section contains minimum evidence requirements. Oral questioning may be used to clarify candidate understanding of the topic and its application.

ACTIVITIES	MINIMUM EVIDENCE REQUIRED	YES	NO	ASSESSOR COMMENTS
1. Complete practical task of test battery performance under observation by an assessor	During a practical assessment, under observation by an assessor, the candidate correctly carried out the following tasks:			
Remove battery from vehicle and inspect the electrolyte of the battery	Removed the -ve battery terminal first and then removed the +ve battery terminal with spanner			
	Removed the vehicle's battery clamp with spanner			
	Checked and cleaned the deposits of sulphate on the vehicle's battery terminals with wire brush/soda water.			
	Checked the electrolyte level in vehicle's battery according to Visual Fill Levels mentioned on vehicle's battery container			
	Toped up vehicle's battery electrolyte level with distilled water according to Visual Fill Levels mentioned on vehicle's battery container.			
	Checked the specific gravity of electrolyte of vehicle's battery as per battery service manual.			
	Inspected the vehicle's battery vent plug holes for chocking and clean the vent holes of vehicle's battery with poker			
Perform load test after charging and refit the battery in the vehicle	Measured the vehicle's battery voltage with Volt Meter/Multi Meter as per vehicle service manual.			
	Checked the vehicle's battery capacity in Ampere Hour (AH) mentioned on vehicle's battery container.			
	Set the charging current in amperes on vehicle's battery charger according to battery capacity in Ampere Hour (AH) and connect the vehicle's battery to vehicle's battery charger.			
	Checked the specific gravity of vehicle's battery during the charging process with Hydro Meter			
	Disconnected the vehicle's battery from the battery charger if specific gravity meets the service manual standards.			
	Connected the vehicle's battery to Battery Load Tester and check the vehicle's battery condition for good, weak or bad on the screen of Battery Load Tester.			
	Replaced the vehicle's battery if found bad during battery load test.			
	Placed the vehicle battery in vehicle on battery mounting and fix the battery clamp with spanner.			
	Connected and tightened the +ve terminal first then connected and tightened the -ve battery terminal with spanners.			
	Applied mineral jelly/grease on battery terminals to prevent the battery terminals from sulphating.			
2. Other requirements	[All other requirements related to the Assessment]			

3. Answer any questions the assessor may have during the practical assessment	Candidate's answers to questions are correct and demonstrate understanding of the topics and their application. Assessor to document below all questions asked and candidate answers. Use extra sheets if required and attach.			

4 LIST OF TOOLS, EQUIPMENT, MATERIAL AND CONTEXT OF ASSESSMENT

INSTRUCTIONS	This section contains information regarding; • Context of the assessment • List of required tools and equipment. • List of consumable items required during the service
1. Context of Assessment	This task will be performed in **real time** environment.

2. List of tools and equipment required (for five candidates)		
S. No	**Items**	**Quantity**
1	Battery Charger	01
2	Spanners Set	02
3	Socket Set	02
4	Pllier	05
5	Personal Protective Equipment Set (PPE)	05
6	Multi meter	02
7	Hydrometer	05
8	Fender Cover Set	02
9	Battery analyser	02

3. List of consumable items required (for five candidates)		
S. No	**Items**	**Quantity**
1	Distilled water	05
2	Amri paper	05
3	Grease	0.25 kg
4	Contact spray WD 40	05
5	Waste Cotton Packs	05

ASSESSMENT MATERIAL **EVIDENCE GUIDE**	# INSTALL AND REPAIR STARTING SYSTEM OF VEHICLE
Qualification Auto Electrician **CS Code**: **Level**: 2 **Credit**: 14 **Version**: 1	

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	1. Assessment Summary and Record 2. Candidate Assessment 3. Assessor Judgment Guide 4. List of required tools/equipment, material and context of assessment

ASSESSMENT AND ASSESSOR DETAILS				
	Competent ☐		**Not Yet Competent** ☐	
	Assessment ☐		Re-Assessment ☐	
	Assessor's Name		Assessor's Code	
	Assessor's Signature		Date	DD MM YYYY

CANDIDATE DETAILS	
	Candidate's Name ..... (First Name / Last Name)
	Father's Name .....
	Institute Name and District .....
	CNIC/BFORM #
	Registration Number issued by Assessment Body .....
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1 ASSESSMENT SUMMARY & RECORD

ACTIVITY	METHOD				DESIRED OUTCOMES	RESULT	
NATURE OF ACTIVITY	WRITTEN	ORAL	PORTFOLIO	OBSERVATION	DESIRED OUTCOMES FOR SUCCESSFUL ASSESSMENT OF COMPETENCY STANDARD: INSTALL AND REPAIR STARTING SYSTEM OF VEHICLE	COMPETENT	NOT YET COMPETENT
Practical Skill Demonstration				✓	• [install and repair starting system of vehicle]		
Knowledge Assessment	✓	✓			• Answer all questions your Assessor may have during the practical assessment.		
Other Requirements			✓		• [List all other requirements]		

2 CANDIDATE ASSESSMENT

Candidate's Name…….... Father's Name ……..

ALL WORK ASSESSED IN THIS COMPETENCY STANDARD MUST BE YOUR OWN WORK.

GUIDANCE TO CANDIDATE

To meet this standard you are required to complete the following tasks within **four hours** timeframe:

- Diagnose and repair faults in starting system of the vehicle
- Repair and install the starter motor on the vehicle

ACTIVITIES	CANDIDATE RESPONSE
1. Complete practical task of installing and repairing starting system of vehicle under observation by an assessor	During a practical assessment, under observation by an assessor, I will correctly : • Diagnose and repair faults in starting system of the vehicle ✓ Remove and test the glow plug from diesel engine of the vehicle with spanner/Multi Meter. ✓ Replace the faulty glow plug of the diesel engine of the vehicle. ✓ Inspect the fuel supply system components of vehicle's diesel engine (fuel tank, fuel lines, fuel filter, fuel pump, injection pump, and fuel rail and fuel injectors) and replace faulty component according to repair manual. ✓ Check the ignition switch and ignition system wiring harness of the vehicle for damaged or broken wires, connectors and thimbles and replace/repair the faulty wires, connectors and thimbles. ✓ Check the ignition coil and ballast resistance by using Multi Meter/Test Lamp according to repair manual of the vehicle and replace faulty ignition coil and ballast resistance. ✓ Check the ignition distributer (contact breaker point/pickup coil, condenser and advance mechanism) and high tension leads by using Multi Meter/Test Lamp/Dwell angle tester. And replace the faulty components. ✓ Check the crankshaft position sensor, camshaft position sensor and ignition module of vehicle's engine equipped with electronic/ distributer less ignition system by using EFI Scanner/Oscilloscope. ✓ Replace the faulty components of the vehicle's electronic/ distributer less ignition system as per service manual of the vehicle. ✓ Test and clean the spark plugs of the petrol engine of the vehicle by using Spark Plug Cleaner & Tester and adjust the spark plug gap with Feeler Gauge as per service manual. ✓ Replace the faulty spark plug of the vehicle. ✓ Attach the high tension leads between the spark plugs and distributer according to firing order as per service manual of the vehicle. ✓ Check and adjust the ignition timing of the vehicle by using a Timing Light according to service manual of the vehicle • Repair and install the starter motor on the vehicle ✓ Check the ignition switch and vehicle's starter motor wiring harness for damaged or broken wires, connectors and thimbles ✓ Replace/repair the faulty wires, connectors and thimbles. ✓ Disconnect the battery and ignition switch connections from the vehicle's starter motor. ✓ Remove starter motor out of vehicle's engine with spanners. ✓ Disassemble the vehicle starter motor with spanners. ✓ Check the starter motor's solenoid switch point, pull in winding, hold in winding by using Multi Meter/Battery and check the solenoid's plunger return spring with steel rule as per vehicle's service manual. ✓ Check the armature of vehicle's starter motor with Multi Meter/Test Lamp/Armature tester (Growler) ✓ Replace faulty armature of the vehicle's starter motor. ✓ Check the field body of vehicle's starter motor with Multi Meter/Test Lamp. ✓ Replace faulty field body of the vehicle's starter motor.

	✓ Check the vehicle's starter motor carbon brushes length (wear) and the carbon brushes spring for damage by using Vernier Calliper /Steel rule according to vehicle's service manual. ✓ Check the bushes and bearings of the vehicle's starter motor for free play. ✓ Replace the faulty bushes and bearing of the vehicle's starter motor. ✓ Check and replace the faulty components of the drive assembly of the vehicle's starter motor. ✓ Check the front and rear end plates of vehicle's starter motor for cracks and damage and replace faulty end plates of vehicle's starter motor. ✓ Assemble the vehicle's starter motor and install on vehicle's engine. ✓ Connect the battery and ignition switch connections to the vehicle's starter motor.
2. Answer any questions your assessor may have during the practical assessment	My answers to questions are correct and demonstrate my understanding of the topics and their application.
3. Other requirements	NA

3 ASSESSOR JUDGEMENT GUIDE

Candidate's Name …… Father's Name……

INSTRUCTIONS FOR ASSESSOR	This section contains minimum evidence requirements. Oral questioning may be used to clarify candidate understanding of the topic and its application.

ACTIVITIES	MINIMUM EVIDENCE REQUIRED	YES	NO	ASSESSOR COMMENTS
1. Complete practical task of installing and repairing starting system of vehicle under observation by an assessor	During a practical assessment, under observation by an assessor, the candidate correctly carried out the following tasks:			
Diagnose and repair faults in starting system of the vehicle	Removed and tested the glow plug from diesel engine of the vehicle with spanner/Multi Meter.			
	Replaced the faulty glow plug of the diesel engine of the vehicle.			
	Inspected the fuel supply system components of vehicle's diesel engine (fuel tank, fuel lines, fuel filter, fuel pump, injection pump, and fuel rail and fuel injectors) and replaced faulty component according to repair manual.			
	Checked the ignition switch and ignition system wiring harness of the vehicle for damaged or broken wires, connectors and thimbles and replaced/repaired the faulty wires, connectors and thimbles.			
	Checked the ignition coil and ballast resistance by using Multi Meter/Test Lamp according to repair manual of the vehicle and replaced faulty ignition coil and ballast resistance.			
	Checked the ignition distributer (contact breaker point/pickup coil, condenser and advance mechanism) and high tension leads by using Multi Meter/Test Lamp/Dwell angle tester. And replaced the faulty components.			
	Checked the crankshaft position sensor, camshaft position sensor and ignition module of vehicle's engine equipped with electronic/ distributer less ignition system by using EFI Scanner/Oscilloscope.			
	Replaced the faulty components of the vehicle's electronic/ distributer less ignition system as per service manual of the vehicle.			
	Tested and cleaned the spark plugs of the petrol engine of the vehicle by using Spark Plug Cleaner & Tester and adjust the spark plug gap with Feeler Gauge as per service manual.			
	Replaced the faulty spark plug of the vehicle.			
	Attached the high tension leads between the spark plugs and distributer according to firing order as per service manual of the vehicle.			
	Checked and adjusted the ignition timing of the vehicle by using a Timing Light according to service manual of the vehicle			
Repair and install the starter motor on the vehicle	Checked the ignition switch and vehicle's starter motor wiring harness for damaged or broken wires, connectors and thimbles			
	Replaced/repaired the faulty wires, connectors and thimbles.			
	Disconnected the battery and ignition switch connections from the vehicle's starter motor.			
	Removed starter motor out of vehicle's engine with spanners.			

	Disassembled the vehicle starter motor with spanners.			
	Checked the starter motor's solenoid switch point, pull in winding, hold in winding by using Multi Meter/Battery and check the solenoid's plunger return spring with steel rule as per vehicle's service manual.			
	Checked the armature of vehicle's starter motor with Multi Meter/Test Lamp/Armature tester (Growler)			
	Replaced faulty armature of the vehicle's starter motor.			
	Checked the field body of vehicle's starter motor with Multi Meter/Test Lamp.			
	Replaced faulty field body of the vehicle's starter motor.			
	Checked the vehicle's starter motor carbon brushes length (wear) and the carbon brushes spring for damage by using Vernier Calliper /Steel rule according to vehicle's service manual.			
	Checked the bushes and bearings of the vehicle's starter motor for free play.			
	Replaced the faulty bushes and bearing of the vehicle's starter motor.			
	Checked and replaced the faulty components of the drive assembly of the vehicle's starter motor.			
	Checked the front and rear end plates of vehicle's starter motor for cracks and damage and replaced faulty end plates of vehicle's starter motor.			
	Assembled the vehicle's starter motor and install on vehicle's engine.			
	Connected the battery and ignition switch connections to the vehicle's starter motor.			
2. Other Requirements	NA			
3. Answer any questions the assessor may have during the practical assessment	Candidate's answers to questions are correct and demonstrate understanding of the topics and their application. Assessor to document below all questions asked and candidate answers. Use extra sheets if required and attach.			

4 LIST OF TOOLS, EQUIPMENT, MATERIAL AND CONTEXT OF ASSESSMENT

INSTRUCTIONS	This section contains information regarding; • Context of the assessment • List of required tools and equipment. • List of consumable items required during the service
1. Context of Assessment	This task will be performed in **real time** environment.

2. List of tools and equipment required (for five candidates)		
S. No	**Items**	**Quantity**
1	Universal diagnostic scanner	1
2	Multimeter	5
3	Repair manual	1
4	Test lamp	5
5	Spanner set	2
6	socket set	2
7	magnetic stick	2
8	Personal protection equipment (PPE) set	5
9	Timing light gun	5
10	Screw driver Flat & Philip set	5
11	Allen key set	2
12	Star key set	2
13	Feeler gauge	2
14	Spark plug cleaner	1
15	Soldering iron	2
16	Combination Plier	2
17	Nose plier	2
18	Fuel pressure gauge	1

3. List of consumable items required (for five candidates)		
S. No	**Items**	**Quantity**
1	Cotton waste	2 litter
2	Cotton gloves	2 Kg
3	Decarbonising fluid	1 dozen
	Soldering coil	1 Kg
5	Soldering paste	600 ml
6	Emery paper	1 coil

ASSESSMENT MATERIAL

EVIDENCE GUIDE

Qualification
Auto Electrician
CS Code:
Level: 2
Credit: 11
Version: 1

INSTALL AND REPAIR CHARGING SYSTEM OF VEHICLE

CONTENTS

ASSESSMENT AND ASSESSOR DETAILS

Competent ☐ **Not Yet Competent** ☐

Assessment ☐ Re-Assessment ☐

Assessor's Name ..... Assessor's Code .....

Assessor's Signature ..... Date ☐☐☐☐☐☐☐☐ DD MM YYYY

CANDIDATE DETAILS

Candidate's Name ..... First Name ..... Last Name

Father's Name .....

Institute Name and District .....

CNIC/BFORM # ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Registration Number issued by Assessment Body .....

Gender Male ☐ Female ☐ Transgender ☐

Candidate's Consent I agree to the time and date of the assessment and am aware of the requirements of the assessment. I fully understand my rights of appeal.

Candidate's Signature .....

ASSESSMENT RESULTS SUMMARY FORM

You can use this coversheet as an *Assessment Results Summary Form*. Simply post a photocopy of this completed coversheet to **NAVTTC**

NAVTTC OFFICE ONLY

1. DATE FORM RECEIVED: ☐☐☐☐☐☐☐☐ DD MM YYYY

2. DATE ENTERED INTO DATABASE: ☐☐☐☐☐☐☐☐ DD MM YYYY

1 ASSESSMENT SUMMARY & RECORD

ACTIVITY	METHOD				DESIRED OUTCOMES	RESULT	
NATURE OF ACTIVITY	WRITTEN	ORAL	PORTFOLIO	OBSERVATION	DESIRED OUTCOMES FOR SUCCESSFUL ASSESSMENT OF COMPETENCY STANDARD: PREPARE TO CARRY OUT HVAC WORK	COMPETENT	NOT YET COMPETENT
Practical Skill Demonstration				✓	• Diagnose faults in charging system of the vehicle • Replace the faulty components of the vehicle alternator • Check/replace/adjust the fan belt of the vehicle		
Knowledge Assessment	✓	✓			• Answer all questions your Assessor may have during the practical assessment.		
Other Requirements			✓		• N/A		

2 CANDIDATE ASSESSMENT

Candidate's Name…….... Father's Name ……..

ALL WORK ASSESSED IN THIS COMPETENCY STANDARD MUST BE YOUR OWN WORK.

GUIDANCE TO CANDIDATE

To meet this standard you are required to complete the following tasks within **three hours** timeframe:

- Diagnose faults in charging system of the vehicle
- Replace the faulty components of the vehicle alternator
- Check/replace/adjust the fan belt of the vehicle

ACTIVITIES	CANDIDATE RESPONSE
1. Complete practical task of Install and repair charging system of vehicle under observation by an assessor	During a practical assessment, under observation by an assessor, I will correctly : • Diagnose faults in charging system of the vehicle. ✓ Check and clean the deposits of sulphate on the vehicle's battery terminals with wire brush/soda water. ✓ Check and tight the battery terminals of the vehicle with spanners. ✓ Apply mineral jelly/grease on battery terminals to prevent sulphating battery terminals of the vehicle ✓ Check and tight vehicle's alternator +ve output terminal with spanner. ✓ Check vehicle's ignition switch +ve output on ignition (IG) point with Test Lamp/Multi Meter ✓ Replace the faulty ignition switch of the vehicle. ✓ Measure the alternator's battery charging current by using Ampere Meter/Clamp Meter according to the service manual of vehicle. ✓ Measure and adjust the vehicle's fan belt tension by using Belt Tension Gauge and spanners for low charging amperes of alternator according to repair manual of the vehicle. ✓ Check the vehicle's alternator output voltage with Volt Meter according to repair manual of the vehicle. ✓ Replace/adjust voltage regulator of the vehicle's alternator for much lower or higher alternator output voltage as per service manual of the vehicle. ✓ Check the vehicle's charging system wiring harness for broken or damaged wires, connectors and thimbles. ✓ Repair/replace and clean the connectors, thimbles and jacks of the vehicle charging system. ✓ Insulate the naked wires of vehicle's charging system with insulation tape. • Replace the faulty components of the vehicle alternator. ✓ Start the engine of the vehicle and hear the noises coming from vehicle's alternator and its bearings. ✓ Replace the noisy bearings of alternator of the vehicle. ✓ Check damaged (weary and cracks) fan belt of vehicle by using Belt Wear Gauge and replace the faulty fan belt of the vehicle. ✓ Check front and rear brackets of the vehicle's alternator for cracks/damage and replace the faulty brackets of the vehicle alternator. ✓ Check output voltage of the vehicle's alternator on different speeds according to repair manual. ✓ Replace voltage regulator of the vehicle's alternator for much lower or higher alternator output voltage as per service manual of the vehicle ✓ Check the diode assembly of vehicle's alternator by using Multi Meter/Test Lamp. ✓ Replace the faulty diode assembly of the vehicle's alternator. ✓ Check the vehicle's alternator carbon brushes and slip rings for wear and tear. ✓ Replace the worn carbon brushes of the vehicle's alternator. ✓ Test the rotor of vehicle's alternator for open, short and ground circuit with a Multi Meter/Test Lamp/Armature Tester (Growler). ✓ Replace the faulty rotor of vehicle's alternator. ✓ Test the stator of vehicle's alternator for open, short and ground circuit with a Multi Meter/Test Lamp.

	✓ Replace the faulty stator of vehicle's alternator. • Check/replace/adjust the fan belt of the vehicle. ✓ Check the fan belt tension of the vehicle with a Belt Tension Gauge according to repair manual. ✓ Tight the loosen fan belt of the vehicle by using Belt Tension Gauge/spanners and a tension bar (steel rod). ✓ Use a wear gauge to check wear and cracks on fan belt of the vehicle. ✓ Replace worn or cracked fan belt of the vehicle and tight the fan belt as per repair manual of the vehicle. ✓ Loose the adjustment nuts and bolts of the vehicle's alternator and replace worn or damaged fan belt of the vehicle. ✓ Place a new fan belt on both crankshaft and alternator pulleys of the vehicle according to repair manual of the vehicle. ✓ Push the alternator of the vehicle with a tension bar (steel bar) to tighten the fan belt of the vehicle as per repair manual. ✓ Check the tension of vehicle fan belt with a Belt Tension Gauge according to repair manual of the vehicle. ✓ Tight the adjusting nuts and bolts of vehicle's alternator with the spanners.
2. Other requirements	• NA
3. Answer any questions your assessor may have during the practical assessment	My answers to questions are correct and demonstrate my understanding of the topics and their application.

3 ASSESSOR JUDGEMENT GUIDE

Candidate's Name …… Father's Name……

INSTRUCTIONS FOR ASSESSOR	This section contains minimum evidence requirements. Oral questioning may be used to clarify candidate understanding of the topic and its application.

ACTIVITIES	MINIMUM EVIDENCE REQUIRED	YES	NO	ASSESSOR COMMENTS
1. Complete practical task of Install and repair charging system of vehicle under observation by an assessor	During a practical assessment, under observation by an assessor, the candidate correctly carried out the following tasks:			
Diagnose faults in charging system of the vehicle.	Checked and cleaned the deposits of sulphate on the vehicle's battery terminals with wire brush/soda water.			
	Checked and tightened the battery terminals of the vehicle with spanners.			
	Applied mineral jelly/grease on battery terminals to prevent sulphating battery terminals of the vehicle			
	Checked and tightened vehicle's alternator +ve output terminal with spanner.			
	Checked vehicle's ignition switch +ve output on ignition (IG) point with Test Lamp/Multi Meter			
	Replaced the faulty ignition switch of the vehicle.			
	Measured the alternator's battery charging current by using Ampere Meter/Clamp Meter according to the service manual of vehicle.			
	Measure and adjust the vehicle's fan belt tension by using Belt Tension Gauge and spanners for low charging amperes of alternator according to repair manual of the vehicle.			
	Checked the vehicle's alternator output voltage with Volt Meter according to repair manual of the vehicle.			
	Replace/adjust voltage regulator of the vehicle's alternator for much lower or higher alternator output voltage as per service manual of the vehicle.			
	Checked the vehicle's charging system wiring harness for broken or damaged wires, connectors and thimbles.			
	Repaired/replace and cleaned the connectors, thimbles and jacks of the vehicle charging system.			
	Insulate the naked wires of vehicle's charging system with insulation tape.			
Replace the faulty components of the vehicle alternator.	Start the engine of the vehicle and hear the noises coming from vehicle's alternator and its bearings.			
	Replace the noisy bearings of alternator of the vehicle.			
	Checked damaged (weary and cracks) fan belt of vehicle by using Belt Wear Gauge and replace the faulty fan belt of the vehicle.			
	Checked front and rear brackets of the vehicle's alternator for cracks/damage and replace the faulty brackets of the vehicle alternator.			
	Checked output voltage of the vehicle's alternator on different speeds according to repair manual.			

	Replace voltage regulator of the vehicle's alternator for much lower or higher alternator output voltage as per service manual of the vehicle			
	Checked the diode assembly of vehicle's alternator by using Multi Meter/Test Lamp.			
	Replace the faulty diode assembly of the vehicle's alternator.			
	Checked the vehicle's alternator carbon brushes and slip rings for wear and tear.			
	Replace the worn carbon brushes of the vehicle's alternator.			
	Test the rotor of vehicle's alternator for open, short and ground circuit with a Multi Meter/Test Lamp/Armature Tester (Growler).			
	Replace the faulty rotor of vehicle's alternator.			
	Test the stator of vehicle's alternator for open, short and ground circuit with a Multi Meter/Test Lamp.			
	Replace the faulty stator of vehicle's alternator.			
Check/replace/adjust the fan belt of the vehicle.	Checked the fan belt tension of the vehicle with a Belt Tension Gauge according to repair manual.			
	Tight the loosen fan belt of the vehicle by using Belt Tension Gauge/spanners and a tension bar (steel rod).			
	Use a wear gauge to check wear and cracks on fan belt of the vehicle.			
	Replace worn or cracked fan belt of the vehicle and tight the fan belt as per repair manual of the vehicle.			
	Loose the adjustment nuts and bolts of the vehicle's alternator and replace worn or damaged fan belt of the vehicle.			
	Place a new fan belt on both crankshaft and alternator pulleys of the vehicle according to repair manual of the vehicle.			
	Push the alternator of the vehicle with a tension bar (steel bar) to tighten the fan belt of the vehicle as per repair manual.			
	Checked the tension of vehicle fan belt with a Belt Tension Gauge according to repair manual of the vehicle.			
	Tightened the adjusting nuts and bolts of vehicle's alternator with the spanners.			
2. Other requirements	NA			

3. Answer any questions the assessor may have during the practical assessment	Candidate's answers to questions are correct and demonstrate understanding of the topics and their application. Assessor to document below all questions asked and candidate answers. Use extra sheets if required and attach.			

4 LIST OF TOOLS, EQUIPMENT, MATERIAL AND CONTEXT OF ASSESSMENT

INSTRUCTIONS	This section contains information regarding; • Context of the assessment • List of required tools and equipment. • List of consumable items required during the service
1. Context of Assessment	This task will be performed in **real time/simulated** environment.

2. List of tools and equipment required (for five candidates)		
S. No	**Items**	**Quantity**
1.	Tool kit complete	5
2.	Test Lamp	5
3.	Multi Meter	5
4.	Tension bar(Steel rod)	5
5.	Belt wear gauge	5
6.	Belt tension gauge	5

3. List of consumable items required (for five candidates)		
S. No	**Items**	**Quantity**
1	Insulation tape	0
2		0
3		0

ASSESSMENT MATERIAL

EVIDENCE GUIDE

Qualification
Auto Electrician
CS Code:
Level: 2
Credit: 11
Version: 1

REPAIR ELECTRICAL ACCESSORIES OF VEHICLE

CONTENTS

ASSESSMENT AND ASSESSOR DETAILS

Competent ☐ **Not Yet Competent** ☐

Assessment ☐ Re-Assessment ☐

Assessor's Name ..... Assessor's Code .....

Assessor's Signature ..... Date ☐☐☐☐☐☐☐☐ DD MM YYYY

CANDIDATE DETAILS

Candidate's Name ..... (First Name / Last Name)

Father's Name .....

Institute Name and District .....

CNIC/BFORM # ☐☐☐☐☐☐☐☐☐☐☐☐☐

Registration Number issued by Assessment Body .....

Gender Male ☐ Female ☐ Transgender ☐

Candidate's Consent I agree to the time and date of the assessment and am aware of the requirements of the assessment. I fully understand my rights of appeal.

Candidate's Signature .....

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1 ASSESSMENT SUMMARY & RECORD

ACTIVITY	METHOD				DESIRED OUTCOMES	RESULT	
NATURE OF ACTIVITY	WRITTEN	ORAL	PORTFOLIO	OBSERVATION	DESIRED OUTCOMES FOR SUCCESSFUL ASSESSMENT OF COMPETENCY STANDARD: REPAIR ELECTRICIAL ACCESSORIES OF VEHICLE	COMPETENT	NOT YET COMPETENT
Practical Skill Demonstration				✓	• Diagnose and repair/replace faults in electrical accessories of the vehicle		
Knowledge Assessment	✓	✓			• Answer all questions your Assessor may have during the practical assessment.		
Other Requirements			✓		• NA		

2 CANDIDATE ASSESSMENT

Candidate's Name…….... Father's Name ……..

ALL WORK ASSESSED IN THIS COMPETENCY STANDARD MUST BE YOUR OWN WORK.

GUIDANCE TO CANDIDATE

To meet this standard you are required to complete the following tasks within **four hours** timeframe:

- Diagnose and repair/replace faults in electrical accessories of the vehicle

ACTIVITIES	CANDIDATE RESPONSE
1. Complete practical task of repairing electrical accessoriese under observation by an assessor	During a practical assessment, under observation by an assessor, I will correctly : • Diagnose faults in electrical accessories of the vehicle ✓ Check and repair/replace the vehicle's power window fuses, wiring harness and connectors for breakage or damage. ✓ Check and repair/replace the vehicle's power window motor (carbon brushes, armature winding, commutator and bushes) by using steel ruler/Multi Meter. ✓ Check the switches of the vehicle's power widow system with Multi Meter/Test Lamp. ✓ Check and repair/replace the vehicle's telescopic radio antenna, antenna wire and antenna wire connectors for breakage or damage ✓ Check and repair/replace the vehicle's cigarette lighter fuse, wires and earth connection for breakage or damage ✓ Check and repair/replace the heating element of the vehicle's cigarette lighter for open circuit with Multi Meter. ✓ Check the fuse, wiring harness and connectors of the vehicle's air conditioner system by using Multi Meter/Test Lamp. ✓ Check and repair/replace the vehicle's air conditioner (AC) switch, thermostatic switch, high pressure switch, low pressure switch and thermal protection switch by using Multi Meter/Test Lamp. ✓ Check and repair/replace the condenser fan motor and its relay, blower motor and its relay and speed controller of the vehicle's air conditioner system by using Multi Meter/Test Lamp. ✓ Check and repair/replace the compressor clutch coil and relay of the vehicle's air conditioner system by using Multi Meter/Test Lamp. ✓ Check and repair/replace the fog lights fuses, fog lights switch, fog lights bulbs, fog lights holders, fog lights connectors and wiring harness of fog lights of the vehicle by using Multi Meter/Test Lamp. ✓ Check and repair/replace the defogger fuse, defogger switch and its relay, defogger connectors and wiring harness of the vehicle's defogger system by using Multi Meter/Test Lamp. ✓ Check and repair/replace the centre locking fuse, centre locking connectors, centre locking wiring harness, centre locking control unit, centre locking door motors and remote control of the vehicle's centre locking system by using Multi Meter/Test Lamp. ✓ Check and repair/replace the sunroof fuse, sunroof switch, sunroof connectors, sunroof wiring harness and sunroof motor of the vehicle by using Multi Meter/Test Lamp. ✓ Check and repair/replace the wiper fuse, wiper switch assembly, wiper connectors, wiper wiring harness and wiper motor of the vehicle by using Multi Meter/Test Lamp. ✓ Check and repair/replace the horn fuse, horn switch and its relay, horn connectors, horn wiring harness and horn of the vehicle by using Multi Meter/Test Lamp. ✓ Check and repair/replace the navigation/tracker fuse, navigation/tracker backup battery, engine cut off relay, Global Positioning System (GPS) module, navigation/tracker transceiver unit and wiring harness of the vehicle navigation/tracker system by using Multi Meter/Test Lamp

2. Other requirements	• NA
3. Answer any questions your assessor may have during the practical assessment	My answers to questions are correct and demonstrate my understanding of the topics and their application.

3 ASSESSOR JUDGEMENT GUIDE

Candidate's Name …… Father's Name……

INSTRUCTIONS FOR ASSESSOR	This section contains minimum evidence requirements. Oral questioning may be used to clarify candidate understanding of the topic and its application.

ACTIVITIES	MINIMUM EVIDENCE REQUIRED	YES	NO	ASSESSOR COMME NTS
1. Complete practical task of repairing electrical accessories under observation by an assessor	During a practical assessment, under observation by an assessor, the candidate correctly carried out the following tasks:			
Diagnose faults in electrical accessories of the vehicle	Checked and repaired/replaced the vehicle's power window fuses, wiring harness and connectors for breakage or damage.			
	Checked and repaired/replaced the vehicle's power window motor (carbon brushes, armature winding, commutator and bushes) by using steel ruler/Multi Meter.			
	Checked and repaired/replaced the switches of the vehicle's power widow system with Multi Meter/Test Lamp.			
	Checked and repaired/replaced the vehicle's telescopic radio antenna, antenna wire and antenna wire connectors for breakage or damage			
	Checked and repaired/replaced the vehicle's cigarette lighter fuse, wires and earth connection for breakage or damage			
	Checked and repaired/replaced the heating element of the vehicle's cigarette lighter for open circuit with Multi Meter.			
	Checked and repaired/replaced the fuse, wiring harness and connectors of the vehicle's air conditioner system by using Multi Meter/Test Lamp.			
	Checked and repaired/replaced the vehicle's air conditioner (AC) switch, thermostatic switch, high pressure switch, low pressure switch and thermal protection switch by using Multi Meter/Test Lamp.			
	Checked and repaired/replaced the condenser fan motor and its relay, blower motor and its relay and speed controller of the vehicle's air conditioner system by using Multi Meter/Test Lamp.			
	Checked and repaired/replaced the switches of the vehicle's power widow system with Multi Meter/Test Lamp.			
	Checked and repaired/replaced the fog lights fuses, fog lights switch, fog lights bulbs, fog lights holders, fog lights connectors and wiring harness of fog lights of the vehicle by using Multi Meter/Test Lamp			
	Checked and repaired/replaced the defogger fuse, defogger switch and its relay, defogger connectors and wiring harness of the vehicle's defogger system by using Multi Meter/Test Lamp.			
	Checked and repaired/replaced the centre locking fuse, centre locking connectors, centre locking wiring harness, centre locking control unit, centre locking door motors and remote control of the vehicle's centre locking system by using Multi Meter/Test Lamp.			
	Checked and repaired/replaced the sunroof fuse, sunroof switch, sunroof connectors, sunroof wiring harness and sunroof motor of the vehicle by using Multi Meter/Test Lamp.			

	Checked and repaired/replaced the wiper fuse, wiper switch assembly, wiper connectors, wiper wiring harness and wiper motor of the vehicle by using Multi Meter/Test Lamp.			
	Checked and repaired/replaced the horn fuse, horn switch and its relay, horn connectors, horn wiring harness and horn of the vehicle by using Multi Meter/Test Lamp.			
	Checked and repaired/replaced the navigation/tracker fuse, navigation/tracker backup battery, engine cut off relay, Global Positioning System (GPS) module, navigation/tracker transceiver unit and wiring harness of the vehicle navigation/tracker system by using Multi Meter/Test Lamp			
2. Other requirements	NA			
3. Answer any questions the assessor may have during the practical assessment	Candidate's answers to questions are correct and demonstrate understanding of the topics and their application. Assessor to document below all questions asked and candidate answers. Use extra sheets if required and attach.			

4 LIST OF TOOLS, EQUIPMENT, MATERIAL AND CONTEXT OF ASSESSMENT

INSTRUCTIONS	This section contains information regarding; • Context of the assessment • List of required tools and equipment. • List of consumable items required during the service
1. Context of Assessment	This task will be performed in **real time/simulated** environment.

2. List of tools and equipment required (for five candidates)		
S. No	**Items**	**Quantity**
1	SST Kit	05
2	Spanners Set	05
3	Socket Set	05
4	Car Creeper	05
5	Personal Protective Equipment Set (PPE)	05
6	Multi meter	05
7	Test lamp	05
8	Scanners	05
9	Seat Cover Set	05
10	Fender Cover Set	05
11	Screw Driver Set	05
12	Compression Gauge	05
13	Fuel Pressure Gauge	05
14	Filler Gauge	05
15	Oil Pressure Gauge	05
16	Torque Wrench	05
17	Car Lift	01

3. List of consumable items required (for five candidates)		
S. No	**Items**	**Quantity**
1	Complete Engine	05
2	Timing Seals	05
3	Engine Oil	20
4	Oil Filter	05
5	Valve Inlet Exhaust Set	05
6	Main Bearings Set	05
7	Big End Bearings Set	05
8	Piston Rings Set	05
9	Waste Cotton Packs	10

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