

# TRAINING REGULATIONS

## AUTOMOTIVE ELECTRICAL ASSEMBLY NC III



### AUTOMOTIVE MANUFACTURING SECTOR

### TECHNICAL EDUCATION AND SKILLS DEVELOPMENT AUTHORITY

East Service Road, South Superhighway, Taguig City, Metro Manila

*Technical Education and Skills Development Act of 1994  
(Republic Act No. 7796)*

Section 22, “Establishment and Administration of the National Trade Skills Standards” of the RA 7796 known as the TESDA Act mandates TESDA to establish national occupational skill standards. The Authority shall develop and implement a certification and accreditation program in which private industry group and trade associations are accredited to conduct approved trade tests, and the local government units to promote such trade testing activities in their respective areas in accordance with the guidelines to be set by the Authority.

The Training Regulations (TR) serve as basis for the:

1. Competency assessment and certification;
2. Registration and delivery of training programs; and
3. Development of curriculum and assessment instruments.

Each TR has four sections:

- Section 1 Definition of Qualification - refers to the group of competencies that describes the different functions of the qualification.
- Section 2 Competency Standards - gives the specifications of competencies required for effective work performance.
- Section 3 Training Standards - contains information and requirements in designing training program for certain Qualification. It includes curriculum design, training delivery; trainee entry requirements; tools, equipment and materials; training facilities; trainer's qualification; and institutional assessment.
- Section 4 National Assessment and Certification Arrangements - describes the policies governing assessment and certification procedure

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# TRAINING REGULATIONS FOR AUTOMOTIVE ELECTRICAL ASSEMBLY NC III

## SECTION 1 AUTOMOTIVE ELECTRICAL ASSEMBLY NC III QUALIFICATION

The AUTOMOTIVE ELECTRICAL ASSEMBLY NC III Qualification consists of competencies that a person must achieve to: rectify faults on installed electrical parts to engine assembly, rectify faults on installed electrical parts and electronic units to body interior compartment, rectify faults on installed electrical parts and electronic units to dash instrument panel and rectify faults on installed electrical parts to exterior and engine compartment. It also covers competencies of rectifying faults on installed audio and video system to automotive vehicle.

This Qualification is packaged from the competency map of the Automotive Industry (Manufacturing sector) as shown in Annex A.

The Units of Competency comprising this Qualification include the following

<b>CODE NO.</b>	<b>BASIC COMPETENCIES</b>
500311109	Lead workplace communication
500311110	Lead small teams
500311111	Develop and practice negotiation skills
500311112	Solve problems related to work activities
500311113	Use mathematical concepts and techniques
500311114	Use relevant technologies

<b>CODE NO.</b>	<b>COMMON COMPETENCIES</b>
ALT311202	Perform Mensuration and Calculation
ALT742201	Read, Interpret and Apply Engineering Drawings
ALT723202	Move and Position Vehicle
ALT723201	Apply Appropriate Sealant/Adhesive
ALT 723205	Perform Shop Maintenance

<b>CODE NO.</b>	<b>CORE COMPETENCIES</b>
ALT827314	Rectify Faults on Installed Electrical Parts to Engine Assembly
ALT827315	Rectify Faults on Installed Electrical Parts and Electronic Units to Body Interior Compartment
ALT827316	Rectify Faults on Installed Electrical Parts and Electronic Units to Dash Instrument Panel
ALT827317	Rectify Faults on Installed Electrical Parts to Exterior and Engine Compartment
ALT827318	Rectify Faults on Installed Audio and Video System to Automotive Vehicle

A person who has achieved this Qualification is competent to be:

- Automotive Electrical Assembly Rectifier

## SECTION 2 COMPETENCY STANDARDS

This section gives the details of the contents of the basic, common and core units of competency required in AUTOMOTIVE ELECTRICAL ASSEMBLY NC III.

### BASIC COMPETENCIES

**UNIT OF COMPETENCY :** LEAD WORKPLACE COMMUNICATION

**UNIT CODE :** 500311109

**UNIT DESCRIPTOR :** This unit covers the knowledge, skills and attitudes required to lead in the dissemination and discussion of ideas, information and issues in the workplace.

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized terms</i> are elaborated in the Range of Variables
1. Communicate information about workplace processes	1.1 Appropriate <b>communication method</b> is selected 1.2 Multiple operations involving several topics areas are communicated accordingly 1.3 Questions are used to gain extra information 1.4 Correct sources of information are identified 1.5 Information is selected and organized correctly 1.6 Verbal and written reporting is undertaken when required 1.7 Communication skills are maintained in all situations
2. Lead workplace discussions	2.1 Response to workplace issues are sought 2.2 Response to workplace issues are provided immediately 2.3 Constructive contributions are made to workplace discussions on such issues as production, quality and safety 2.4 Goals/objectives and action plan undertaken in the workplace are communicated
3. Identify and communicate issues arising in the workplace	3.1 Issues and problems are identified as they arise 3.2 Information regarding problems and issues are organized coherently to ensure clear and effective communication 3.3 Dialogue is initiated with appropriate personnel 3.4 Communication problems and issues are raised as they arise

## RANGE OF VARIABLES

VARIABLE	RANGE
1. Methods of communication	1.1 Non-verbal gestures 1.2 Verbal 1.3 Face to face 1.4 Two-way radio 1.5 Speaking to groups 1.6 Using telephone 1.7 Written 1.8 Internet

## EVIDENCE GUIDE

<p>1. Critical aspects of competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Dealt with a range of communication/information at one time</li> <li>1.2 Made constructive contributions in workplace issues</li> <li>1.3 Sought workplace issues effectively</li> <li>1.4 Responded to workplace issues promptly</li> <li>1.5 Presented information clearly and effectively written form</li> <li>1.6 Used appropriate sources of information</li> <li>1.7 Asked appropriate questions</li> <li>1.8 Provided accurate information</li> </ul>
<p>2. Underpinning knowledge</p>	<ul style="list-style-type: none"> <li>2.1 Organization requirements for written and electronic communication methods</li> <li>2.2 Effective verbal communication methods</li> </ul>
<p>3. Underpinning skills</p>	<ul style="list-style-type: none"> <li>3.1 Organize information</li> <li>3.2 Understand and convey intended meaning</li> <li>3.3 Participate in variety of workplace discussions</li> <li>3.4 Comply with organization requirements for the use of written and electronic communication methods</li> </ul>
<p>4. Resource implications</p>	<p>The following resources <b>MUST</b> be provided:</p> <ul style="list-style-type: none"> <li>4.1 Variety of Information</li> <li>4.2 Communication tools</li> <li>4.3 Simulated workplace</li> </ul>
<p>5. Method of assessment</p>	<p>Competency may be assessed through:</p> <ul style="list-style-type: none"> <li>5.1 Competency in this unit must be assessed through</li> <li>5.2 Direct Observation</li> <li>5.3 Interview</li> </ul>
<p>6. Context of assessment</p>	<ul style="list-style-type: none"> <li>6.1 Competency may be assessed in the workplace or in simulated workplace environment</li> </ul>

**UNIT OF COMPETENCY : LEAD SMALL TEAMS**

**UNIT CODE : 500311110**

**UNIT DESCRIPTOR :** This unit covers the knowledge, skills and attitudes to lead small teams including setting and maintaining team and individual performance standards.

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized terms</i> are elaborated in the Range of Variables
1. Provide team leadership	1.1 <b>Work requirements</b> are identified and presented to team members 1.2 Reasons for instructions and requirements are communicated to team members 1.3 <b>Team members' queries and concerns</b> are recognized, discussed and dealt with
2. Assign responsibilities	2.1 Duties, and responsibilities are allocated having regard to the skills, knowledge and aptitude required to properly undertake the assigned task and according to company policy 2.2 Duties are allocated having regard to individual preference, domestic and personal considerations, whenever possible
3. Set performance expectations for team members	3.1 Performance expectations are established based on client needs and according to assignment requirements 3.2 Performance expectations are based on individual team members duties and area of responsibility 3.3 Performance expectations are discussed and disseminated to individual team members
4. Supervised team performance	4.1 <b>Monitoring of performance</b> takes place against defined performance criteria and/or assignment instructions and corrective action taken if required 4.2 Team members are provided with <b>feedback</b> , positive support and advice on strategies to overcome any deficiencies 4.3 <b>Performance issues</b> which cannot be rectified or addressed within the team are referenced to appropriate personnel according to employer policy 4.4 Team members are kept informed of any changes in the priority allocated to assignments or tasks which might impact on client/customer needs and satisfaction 4.5 Team operations are monitored to ensure that employer/client needs and requirements are met 4.6 Follow-up communication is provided on all issues affecting the team 4.7 All relevant documentation is completed in accordance with company procedures

## RANGE OF VARIABLES

VARIABLE	RANGE
1. Work requirements	1.1 Client Profile 1.2 Assignment instructions
2. Team member's concerns	2.1 Roster/shift details
3. Monitor performance	3.1 Formal process 3.2 Informal process
4. Feedback	4.1 Formal process 4.2 Informal process
5. Performance issues	5.1 Work output 5.2 Work quality 5.3 Team participation 5.4 Compliance with workplace protocols 5.5 Safety 5.6 Customer service

## EVIDENCE GUIDE

<p>1. Critical aspects of competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Maintained or improved individuals and/or team performance given a variety of possible scenario</li> <li>1.2 Assessed and monitored team and individual performance against set criteria</li> <li>1.3 Represented concerns of a team and individual to next level of management or appropriate specialist and to negotiate on their behalf</li> <li>1.4 Allocated duties and responsibilities, having regard to individual's knowledge, skills and aptitude and the needs of the tasks to be performed</li> <li>1.5 Set and communicated performance expectations for a range of tasks and duties within the team and provided feedback to team members</li> </ul>
<p>2. Underpinning knowledge</p>	<ul style="list-style-type: none"> <li>2.1 Company policies and procedures</li> <li>2.2 Relevant legal requirements</li> <li>2.3 How performance expectations are set</li> <li>2.4 Methods of Monitoring Performance</li> <li>2.5 Client expectations</li> <li>2.6 Team member's duties and responsibilities</li> </ul>
<p>3. Underpinning skills</p>	<ul style="list-style-type: none"> <li>3.1 Communication skills required for leading teams</li> <li>3.2 Informal performance counseling skills</li> <li>3.3 Team building skills</li> <li>3.4 Negotiating skills</li> </ul>
<p>4. Resource implications</p>	<p>The following resources <b>MUST</b> be provided:</p> <ul style="list-style-type: none"> <li>4.1 Access to relevant workplace or appropriately simulated environment where assessment can take place</li> <li>4.2 Materials relevant to the proposed activity or task</li> </ul>
<p>5. Methods of assessment</p>	<p>Competency may be assessed through:</p> <ul style="list-style-type: none"> <li>5.1 Direct observations of work activities of the individual member in relation to the work activities of the group</li> <li>5.2 Observation of simulation and/or role play involving the participation of individual member to the attainment of organizational goal</li> <li>5.3 Case studies and scenarios as a basis for discussion of issues and strategies in teamwork</li> </ul>
<p>6. Context of assessment</p>	<ul style="list-style-type: none"> <li>6.1 Competency assessment may occur in workplace or any appropriately simulated environment</li> <li>6.2 Assessment shall be observed while task are being undertaken whether individually or in-group</li> </ul>

**UNIT OF COMPETENCY: DEVELOP AND PRACTICE NEGOTIATION SKILLS**

**UNIT CODE : 500311111**

**UNIT DESCRIPTOR :** This unit covers the skills, knowledge and attitudes required to collect information in order to negotiate to a desired outcome and participate in the negotiation.

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized terms</i> are elaborated in the Range of Variables
1. Plan negotiations	1.1 Information on <b><i>preparing for negotiation</i></b> is identified and included in the plan 1.2 Information on creating <b><i>non verbal environments</i></b> for positive negotiating is identified and included in the plan 1.3 Information on <b><i>active listening</i></b> is identified and included in the plan 1.4 Information on different <b><i>questioning techniques</i></b> is identified and included in the plan 1.5 Information is checked to ensure it is correct and up-to- date
2. Participate in negotiations	2.1 Criteria for successful outcome are agreed upon by all parties 2.2 Desired outcome of all parties are considered 2.3 Appropriate language is used throughout the negotiation 2.4 A variety of questioning techniques are used 2.5 The issues and processes are documented and agreed upon by all parties 2.6 Possible solutions are discussed and their viability assessed 2.7 Areas for agreement are confirmed and recorded 2.8 Follow-up action is agreed upon by all parties

## RANGE OF VARIABLES

VARIABLE	RANGE
1. Preparing for negotiation	1.1 Background information on other parties to the negotiation 1.2 Good understanding of topic to be negotiated 1.3 Clear understanding of desired outcomes 1.4 Personal attributes 1.4.1 self awareness 1.4.2 self esteem 1.4.3 objectivity 1.4.4 empathy 1.4.5 respect for others 1.5 Interpersonal skills 1.5.1 listening/reflecting 1.5.2 non verbal communication 1.5.3 assertiveness 1.5.4 behavior labeling 1.5.5 testing understanding 1.5.6 seeking information 1.5.7 self disclosing 1.6 Analytic skills 1.6.1 observing differences between content and process 1.6.2 identifying bargaining information 1.6.3 applying strategies to manage process 1.6.4 applying steps in negotiating process 1.6.5 strategies to manage conflict 1.6.6 steps in negotiating process 1.6.7 options within organization and externally for resolving conflict
2. Non verbal environments	2.1 Friendly reception 2.2 Warm and welcoming room 2.3 Refreshments offered 2.4 Lead in conversation before negotiation begins
3. Active listening	3.1 Attentive 3.2 Don't interrupt 3.3 Good posture 3.4 Maintain eye contact 3.5 Reflective listening
4. Questioning techniques	4.1 Direct 4.2 Indirect 4.3 Open-ended

## EVIDENCE GUIDE

<p>1. Critical aspects of competency</p>	<p>Assessment requires evidence that the candidate:</p> <p>1.1 Demonstrated sufficient knowledge of the factors influencing negotiation to achieve agreed outcome</p> <p>1.2 Participated in negotiation with at least one person to achieve an agreed outcome</p>
<p>2. Underpinning knowledge and Attitude</p>	<p>2.1 Codes of practice and guidelines for the organization</p> <p>2.2 Organizations policy and procedures for negotiations</p> <p>2.3 Decision making and conflict resolution strategies procedures</p> <p>2.4 Problem solving strategies on how to deal with unexpected questions and attitudes during negotiation</p> <p>2.5 Flexibility</p> <p>2.6 Empathy</p>
<p>3. Underpinning skills</p>	<p>3.1 Interpersonal skills to develop rapport with other parties</p> <p>3.2 Communication skills (verbal and listening)</p> <p>3.3 Observation skills</p> <p>3.1 Negotiation skills</p>
<p>4. Resource implications</p>	<p>The following resources <b>MUST</b> be provided:</p> <p>4.1 Room with facilities necessary for the negotiation process</p> <p>4.2 Human resources (negotiators)</p>
<p>5. Method of assessment</p>	<p>Competency may be assessed through:</p> <p>5.1 Observation/demonstration and questioning</p> <p>5.2 Portfolio assessment</p> <p>5.3 Oral and written questioning</p> <p>5.4 Third party report</p>
<p>6. Context of assessment</p>	<p>6.1 Competency to be assessed in real work environment or in a simulated workplace setting.</p>

**UNIT OF COMPETENCY : SOLVE PROBLEMS RELATED TO WORK ACTIVITIES**

**UNIT CODE : 500311112**

**UNIT DESCRIPTOR :** This unit of competencies covers the knowledge, skills and attitudes required to solve problems in the workplace including the application of problem solving techniques and to determine and resolve the root cause of problems.

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized</i> terms are elaborated in the Range of Variables
1. Identify the problem	1.1 Variances are identified from normal operating parameters; and product quality 1.2 Extent, cause and nature are of the problem are defined through observation, investigation and <b><i>analytical techniques</i></b> 1.3 <b><i>Problems</i></b> are clearly stated and specified
2. Determine fundamental causes of the problem	2.1 Possible causes are identified based on experience and the use of problem solving tools / analytical techniques. 2.2 Possible cause statements are developed based on findings 2.3 Fundamental causes are identified per results of investigation conducted
3. Determine corrective action	3.1 All possible options are considered for resolution of the problem 3.2 Strengths and weaknesses of possible options are considered 3.3 Corrective actions are determined to resolve the problem and possible future causes 3.4 <b><i>Action plans</i></b> are developed identifying measurable objectives, resource needs and timelines in accordance with safety and operating procedures
4. Provide recommendation/s to manager	4.1 Report on recommendations are prepared 4.2 Recommendations are presented to appropriate personnel. 4.3 Recommendations are followed-up, if required

## RANGE OF VARIABLES

VARIABLE	RANGE
1. Analytical techniques	1.1 Brainstorming 1.2 Intuitions/Logic 1.3 Cause and effect diagrams 1.4 Pareto analysis 1.5 SWOT analysis 1.6 Gant chart, Pert CPM and graphs 1.7 Scatter diagrams
2. Problem	2.1 Non – routine process and quality problems 2.2 Equipment selection, availability and failure 2.3 Teamwork and work allocation problem 2.4 Safety and emergency situations and incidents
3. Action plans	3.1 Priority requirements 3.2 Measurable objectives 3.3 Resource requirements 3.4 Timelines 3.5 Co-ordination and feedback requirements 3.6 Safety requirements 3.7 Risk assessment 3.8 Environmental requirements

## EVIDENCE GUIDE

<p>1. Critical aspects of competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Identified the problem</li> <li>1.2 Determined the fundamental causes of the problem</li> <li>1.3 Determined the correct / preventive action</li> <li>1.4 Provided recommendation to manager</li> </ul> <p>These aspects may be best assessed using a range of scenarios / case studies / what ifs as a stimulus with a walk through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations that may have happened.</p>
<p>2. Underpinning knowledge</p>	<ul style="list-style-type: none"> <li>2.1 Competence includes a thorough knowledge and understanding of the process, normal operating parameters, and product quality to recognize non-standard situations</li> <li>2.2 Competence to include the ability to apply and explain, sufficient for the identification of fundamental cause, determining the corrective action and provision of recommendations             <ul style="list-style-type: none"> <li>2.2.1 Relevant equipment and operational processes</li> <li>2.2.2 Enterprise goals, targets and measures</li> <li>2.2.3 Enterprise quality, OHS and environmental requirement</li> <li>2.2.4 Principles of decision making strategies and techniques</li> <li>2.2.5 Enterprise information systems and data collation</li> <li>2.2.6 Industry codes and standards</li> </ul> </li> </ul>
<p>3. Underpinning skills</p>	<ul style="list-style-type: none"> <li>3.1 Using range of formal problem solving techniques</li> <li>3.2 Identifying and clarifying the nature of the problem</li> <li>3.3 Devising the best solution</li> <li>3.4 Evaluating the solution</li> <li>3.5 Implementation of a developed plan to rectify the problem</li> </ul>

4. Resource implications	4.1 Assessment will require access to an operating plant over an extended period of time, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios / case studies / what ifs will be required as well as bank of questions which will be used to probe the reason behind the observable action.
5. Method of assessment	<p>Competency may be assessed through:</p> <p>5.1 Case studies on solving problems in the workplace</p> <p>5.2 Observation</p> <p>The unit will be assessed in a holistic manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation. Simulation may be required to allow for timely assessment of parts of this unit of competency. Simulation should be based on the actual workplace and will include walk through of the relevant competency components.</p>
6. Context of assessment	6.1 In all workplace, it may be appropriate to assess this unit concurrently with relevant teamwork or operation units.

**NIT OF COMPETENCY: USE MATHEMATICAL CONCEPTS AND TECHNIQUES**

**UNIT CODE : 500311113**

**UNIT DESCRIPTOR :** This unit covers the knowledge, skills and attitudes required in the application of mathematical concepts and techniques.

<b>ELEMENT</b>	<b>Performance Criteria</b> <i>Italicized</i> terms are elaborated in the Range of Variables
1. Identify mathematical tools and techniques to solve problem	1.1 Problem areas are identified based on given condition 1.2 <b>Mathematical techniques</b> are selected based on the given problem
2. Apply mathematical procedure / solution	2.1 Mathematical techniques are applied based on the problem identified 2.2 Mathematical computations are performed to the level of accuracy required for the problem 2.3 Results of mathematical computation is determined and verified based on job requirements
3. Analyze results	3.1 Result of application is reviewed based on expected and required specifications and outcome 3.2 <b>Appropriate action</b> is applied in case of error

## RANGE OF VARIABLES

VARIABLE	RANGE
1. Mathematical techniques	May include but are not limited to: 1.1 Four fundamental operations 1.2 Measurements 1.3 Use/Conversion of units of measurements 1.4 Use of standard formulas
2. Appropriate action	2.1 Review in the use of mathematical techniques (e.g. recalculation, re-modeling) 2.2 Report error to immediate superior for proper action

## EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Identified, applied and reviewed the use of mathematical concepts and techniques to workplace problems
2. Underpinning knowledge	2.1 Fundamental operation (addition, subtraction, division, multiplication) 2.2 Measurement system 2.3 Precision and accuracy 2.4 Basic measuring tools/devices
3. Underpinning skills	3.1 Applying mathematical computations 3.2 Using calculator 3.3 Using different measuring tools
4. Resource implications	The following resources <b>MUST</b> be provided: 4.1 Calculator 4.2 Basic measuring tools 4.3 Case Problems
5. Method of assessment	Competency may be assessed through: 5.1 Authenticated portfolio 5.2 Written Test 5.3 Interview/Oral Questioning 5.4 Demonstration
6. Context of assessment	6.1 Competency may be assessed in the work place or in a simulated work place setting

**UNIT OF COMPETENCY: USE RELEVANT TECHNOLOGIES**

**UNIT CODE : 500311114**

**UNIT DESCRIPTOR :** This unit of competency covers the knowledge, skills, and attitude required in selecting, sourcing and applying appropriate and affordable technologies in the workplace.

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized</i> terms are elaborated in the Range of Variables
1. Study/select appropriate technology	1.1 Usage of different <b>technologies</b> is determined based on job requirements 1.2 Appropriate technology is selected as per work specification
2. Apply relevant technology	2.1 Relevant technology is effectively used in carrying out function 2.2 Applicable software and hardware are used as per task requirement 2.3 <b>Management concepts</b> are observed and practiced as per established industry practices
3. Maintain/enhance of relevant technology	3.1 Maintenance of technology is applied in accordance with the <b>industry standard operating procedure, manufacturer's operating guidelines</b> and <b>occupational health and safety procedure</b> to ensure its operative ability 3.2 Updating of technology is maintained through continuing education or training in accordance with job requirement 3.3 Technology failure/ defect is immediately reported to the concern/responsible person or section for <b>appropriate action</b>

## RANGE OF VARIABLES

VARIABLE	RANGE
1. Technology	May include but are not limited to: 1.1 Office technology 1.2 Industrial technology 1.3 System technology 1.4 Information technology 1.5 Training technology
2. Management concepts	May include but not limited to: 2.1 Real Time Management 2.2 KAIZEN or continuous improvement 2.3 5s 2.4 Total Quality Management 2.5 Other management/productivity tools
3. Industry standard operating procedure	3.1 Written guidelines relative to the usage of office technology/equipment 3.2 Verbal advise/instruction from the co-worker
4. Manufacturer's operating guidelines/ instructions	4.1 Written instruction/manuals of specific technology/ equipment 4.2 General instruction manual 4.3 Verbal advise from manufacturer relative to the operation of equipment
5. Occupational health and safety procedure	5.1 Relevant statutes on OHS 5.2 Company guidelines in using technology/equipment
6. Appropriate action	6.1 Implementing preventive maintenance schedule 6.2 Coordinating with manufacturer's technician

## EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Studied and selected appropriate technology consistent with work requirements 1.2 Applied relevant technology 1.3 Maintained and enhanced operative ability of relevant technology
2. Underpinning knowledge	2.1 Awareness on technology and its function 2.2 Repair and maintenance procedure 2.3 Operating instructions 2.4 Applicable software 2.5 Communication techniques 2.6 Health and safety procedure 2.7 Company policy in relation to relevant technology 2.8 Different management concepts 2.9 Technology adaptability
3. Underpinning skills	3.1 Relevant technology application/implementation 3.2 Basic communication skills 3.3 Software applications skills 3.4 Basic troubleshooting skills
4. Resource implications	The following resources <b>MUST</b> be provided: 4.1 Relevant technology 4.2 Interview and demonstration questionnaires 4.3 Assessment packages
5. Method of assessment	Competency must be assessed through: 5.1 Interview 5.2 Actual demonstration 5.3 Authenticated portfolio (related certificates of training/seminar)
6. Context of assessment	6.1 Competency may be assessed in actual workplace or simulated environment

## COMMON COMPETENCIES

**UNIT OF COMPETENCY :** PERFORM MENSURATION AND CALCULATION

**UNIT CODE :** ALT311202

**UNIT DESCRIPTOR :** This unit covers the knowledge, skills and attitudes in measuring and calculating using tools and measuring instrument. It also covers caring for and handling of measuring instrument.

ELEMENT	PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables
1. Select measuring instruments	1.1 Object or component to be measured is identified 1.2 Correct specifications are obtained from relevant source 1.3 Appropriate <b><i>measuring instrument</i></b> is selected according to job requirements
2. Carry out measurements and calculation	2.1 Measuring tools are selected in line with job requirements 2.2 Accurate measurements are obtained to job 2.3 <b><i>Calculation</i></b> needed to complete work tasks are performed using the four fundamental operation of addition (+), subtraction (-), multiplication (x) and division (/). 2.4 Calculations involving fractions, percentages and mixed numbers are used to complete workplace tasks. 2.5 Numerical computation is self-checked and corrected for accuracy 2.6 Instruments are read to the limit of accuracy of the tool.
3. Maintain measuring instruments	3.4 Measuring instruments are kept free from corrosion 3.4 Measuring instruments are not dropped to avoid damage 3.4 Measuring instruments are cleaned before and after using.

## RANGE OF VARIABLES

VARIABLE	RANGE
1. Measuring instruments	Measuring instruments includes: 1.1 Multitester 1.2 Micrometer (In-out, depth) 1.3 Vernier caliper (Out, inside) 1.4 Dial gauge with Mag. Std. 1.5 Plastigauge 1.6 Straight edge 1.7 Thickness gauge 1.8 Torque gauge 1.9 Small hole gauge 1.10 Telescopic gauge 1.11 Try square 1.12 Protractor 1.13 Combination gauge 1.14 Steel rule
2. Calculation	Includes calculation of the following: 2.1 Volume 2.2 Area 2.3 Displacement 2.4 Inside diameter 2.5 Circumference 2.6 Length 2.7 Thickness 2.8 Outside diameter 2.9 Taper 2.10 Out of roundness 2.11 Oil clearance 2.12 End play/thrust clearance

## EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Selected measuring instruments 1.2 Carried-out measurements and calculations. 1.3 Maintained measuring instruments
2. Underpinning knowledge	2.1 Types of measuring instruments and its uses 2.2 Safe handling procedures in using measuring instruments 2.3 Four fundamental operation of mathematics 2.2 Formula for volume, area, perimeter and other geometric figures
3. Underpinning skills	3.1 Caring and handling measuring instruments 3.2 Calibrating and using measuring instruments 3.3 Performing calculation by Addition, Subtraction, Multiplication and Division 3.4 Visualizing objects and shapes 3.4 Interpreting formula for volume, area, perimeter and other geometric figures
4. Resource implications	The following resources <b>MUST</b> be provided: 4.1 Workplace location 4.2 Measuring instrument appropriate to servicing processes 4.3 Instructional materials relevant to the propose activity
5. Method of assessment	Competency may be assessed through: 5.1 Observation with questioning 5.2 Written or oral examination 5.3 Interview 5.4 Demonstration with questioning
6. Context of assessment	6.1 Competency elements must be assessed in a safe working environment 6.2 Assessment may be conducted in a workplace or simulated environment

**UNIT OF COMPETENCY :**    **READ, INTERPRET AND APPLY ENGINEERING DRAWINGS**

**UNIT CODE**                        :    **ALT742201**

**UNIT DESCRIPTOR**                :    This unit deals with identifying, interpreting and applying automotive mechanical assembly engineering manuals / specifications in accordance with requirements of the job.

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized</i> terms are elaborated in the Range of Variables
1. Identify and access engineering manuals / specifications	1.1 Appropriate <i>manuals</i> are identified and accessed as per job requirements. 1.2 Version and date of manual is checked to ensure correct specification and procedure are identified.
2. Interpret manuals	2.1 Relevant sections, chapters of manuals/specifications are located in relations to the work to be conducted 2.2 Information and procedure in the manual are interpreted in accordance to industry practices
3. Apply information in manual	3.1 Manual is interpreted according to job requirements 3.2 Work steps are correctly identified in accordance with manufacturer specification 3.3 Manual data is applied according to the given task 3.4 All correct sequencing and adjustments are interpreted in accordance with information contained on the manual or specifications
4. Store manuals	4.1 Manual or specification are stored appropriately to ensure prevention of damage, ready access and updating of information when required in accordance with company requirements

## RANGE OF VARIABLES

VARIABLE	RANGE
1. Manuals	Kinds of manuals: 1.1 Manufacturer's specification manual 1.2 Vehicle assembly manual 1.3 Vehicle quality standard manual 1.4 Vehicle specification manual

## EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Identified and accessed manual/specification 1.2 Interpreted manuals 1.3 Applied information in manuals 1.4 Stored manuals
2. Underpinning knowledge	2.1 Types of manuals used in automotive industry 2.2 Identification of symbols used in the manuals 2.3 Identification of units of measurements 2.4 Unit conversion
3. Underpinning skills	3.1 Reading and comprehension skills required to identify and interpret automotive manuals and specifications 3.2 Accessing information and data
4. Resource Implications	The following resources <b>MUST</b> be provided: 4.1 All manuals/catalogues relative to Automotive 4.2 Work order 4.3 Actual vehicle or simulator
5. Method of assessment	Competency <b>MUST</b> be assessed through: 5.1 Observation with questioning 5.2 Interview
6. Context of assessment	6.1 Assessment must be undertaken in accordance with the endorsed TESDA assessment guidelines 6.2 Assessment may be conducted in the workplace or a simulated environment.

**UNIT OF COMPETENCY : MOVE AND POSITION VEHICLE**

**UNIT CODE : ALT723202**

**UNIT DESCRIPTOR :** This unit covers the knowledge, skills and attitude needed to move and position vehicle in a workshop before and after servicing.

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized</i> terms are elaborated in the Range of Variables
1. Prepare vehicle for driving	1.2 <b>Check-up procedures</b> is performed based on vehicle manufacturer standard
2. Move and position vehicle	2.1 Select vehicle to be moved or re-position. 2.2 Drive the vehicle to appropriate location 2.3 Park vehicle following <b>parking safety techniques</b> and procedure
3. Check the vehicle	3.1 <b>Vehicle</b> position is checked as per required 3.2 Vehicle is checked for external damages

## RANGE OF VARIABLE

VARIABLE	RANGE
1. Check-up procedure	Check-up procedures include the following: 1.1 Oil level 1.2 Brake fluid 1.3 Clutch fluid 1.4 Coolant level 1.5 Battery (electrolyte) 1.6 Tire pressure 1.7 Position of driving gear 1.8 Lighting and warning devices
2. Vehicles	2.1 Vehicles with automatic transmission 2.2 Vehicles with manual transmission
3. Parking safety techniques	3.1 Engaging of park brake 3.2 Vehicle parking position 3.3 Front wheel position

## EVIDENCE GUIDE

1. Critical aspects of competency	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Prepared vehicle for driving.</li> <li>1.2 Moved and positioned vehicle</li> <li>1.3 Checked the vehicle.</li> </ul>
2. Underpinning knowledge and attitudes	<ul style="list-style-type: none"> <li>2.1 Driver's code of conduct</li> <li>2.2 Workshop signs and symbols</li> <li>2.3 Driving skills</li> <li>2.4 Vehicle accessories for safe driving and parking</li> </ul>
3. Underpinning skills	<ul style="list-style-type: none"> <li>3.1 Ability to handle vehicle/maneuver vehicle the easiest way</li> <li>3.2 Immediate response to accident</li> <li>3.3 Preparing vehicle for driving</li> <li>3.4 Parking downhill, uphill, parallel</li> <li>3.5 Shifting gears</li> <li>3.6 Maneuvering</li> </ul>
4. Resource implications	<p>The following resources <b>MUST</b> be provided:</p> <ul style="list-style-type: none"> <li>4.1 Driving range/area</li> <li>4.2 Appropriate vehicle for driving</li> <li>4.3 Vehicle accessories</li> </ul>
5. Method of assessment	<p>Competency <b>MUST</b> be assessed through:</p> <ul style="list-style-type: none"> <li>5.1 Observation with questioning</li> <li>5.2 Written or oral examination</li> </ul>
6. Context of assessment	<ul style="list-style-type: none"> <li>6.1 Assessment must be undertaken in accordance with the endorsed TESDA assessment guidelines</li> <li>6.2 Assessment of practical skills must be done in a workplace or simulated environment.</li> </ul>

**UNIT OF COMPETENCY :**     **APPLY APPROPRIATE SEALANT/ADHESIVE**

**UNIT CODE :**                 **ALT723201**

**UNIT DESCRIPTOR :**         This competency unit covers the selection and application of sealant/adhesives.

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized</i> terms are elaborated in the Range of Variables
1. Identify appropriate sealant / adhesive	1.1 <b>Sealant/adhesive</b> is selected in line with job requirements and manufacturer's specification 1.2 <b>Sealant/adhesive checking</b> is performed to ensure that product is fit for use.
2. Prepare surface for sealant / adhesive application	2.1 Surface materials are identified as per construction 2.2 Surface is cleaned and free of moisture, dust and other foreign matters to ensure maximum adhesion or seal.
3. Apply Sealant / adhesive evenly	3.1 Sealant/adhesive is applied evenly on the surface in line with manufacturer's specification 3.2 Excess sealant/adhesive is removed by sanding or scrapping 3.3 <b>Tools and equipment</b> used to apply sealant/adhesive are appropriate to job requirements 3.4 <b>Safety</b> are observed and PPE are worn in accordance with industry SOP 3.4 <b>Hazards</b> associated with the use of sealant and adhesives are identified.
4. Store / Dispose of sealant / adhesive	4.1 Sealant/adhesive are stored as per prescribed procedure 4.2 Waste are disposed as per workshop SOP

## RANGE OF VARIABLES

VARIABLE	RANGE
1. Sealant/Adhesive	Sealant/adhesive includes: 1.1 Form in Place Gasket (FIG) 1.2 Ribbon Sealer 1.3 Hametite 1.4 Silicon Body sealer 1.5 Prestite for Auto and Auto Aircon
2. Adhesive/Sealant checking	Adhesive/Sealant checking includes: 2.1 Expiry date 2.2 Free of contamination 2.3 Cap/Covers 2.4 Tightly closed 2.5 Concentration
3. Tools and equipment	Tools and equipment include: 3.1 Putty knife 3.2 Scraper 3.3 Compressor 3.4 Steel brush 3.5 Paint brush 3.6 Rubber hammer 3.7 Hand tools Personal protective equipment include: 3.8 Gloves 3.9 Apron 3.10 Safety shoes 3.11 Goggles 3.12 Gas mask
4. Safety	Safety includes: 4.1 Ventilation 4.2 Handling of Flammable/Irritating substances 4.3 Use of Personal Protective Equipment
5. Hazards	Hazard includes: 5.1 Fumes 5.2 Skin irritation 5.3 Burns

## EVIDENCE GUIDE

1. Critical aspects of competency	<p>Assessment requires evidence that the candidate:</p> <ol style="list-style-type: none"> <li>1.1 Identified appropriate sealant/adhesives</li> <li>1.2 Prepared surface for sealant/adhesive</li> <li>1.3 Applied sealant/adhesive</li> <li>1.4 Stored unused or dispose of used sealant/adhesive</li> </ol>
2. Underpinning knowledge and attitude	<ol style="list-style-type: none"> <li>2.1 OH &amp; S regulation</li> <li>2.2 Safe handling of sealant/adhesive</li> <li>2.3 Industry code of practice</li> <li>2.4 Procedures in sealant/adhesive application</li> <li>2.5 Procedures in interpreting manuals</li> </ol>
3. Underpinning skills	<ol style="list-style-type: none"> <li>3.1 Handling sealant/adhesive</li> <li>3.2 Applying sealant/adhesive</li> <li>3.3 Sanding the surface</li> <li>3.4 Use of tools, equipment</li> <li>3.5 Mixing of body filler and epoxy base and hardener</li> </ol>
4. Resource implications	<p>The following resources <b>MUST</b> be provided:</p> <ol style="list-style-type: none"> <li>4.1 Materials relevant to the activity</li> <li>4.2 Appropriate tools and equipment</li> <li>4.3 Real or simulated workplace</li> </ol>
5. Method of assessment	<p>Competency <b>MUST</b> be assessed through</p> <ol style="list-style-type: none"> <li>5.1 Observation with questioning</li> <li>5.2 Interview related to: <ul style="list-style-type: none"> <li>• Safe and correct use of tools and equipment</li> <li>• Application of adhesive/sealant</li> </ul> </li> </ol>
6. Context of assessment	<ol style="list-style-type: none"> <li>6.1 Competency elements must be assessed in a safe working environment</li> <li>6.2 Assessment may be done in a workplace or simulated environment</li> </ol>

**UNIT OF COMPETENCY :**    **PERFORM SHOP MAINTENANCE**

**UNIT CODE**                        :    **ALT723205**

**UNIT DESCRIPTOR**            :    This unit deals with inspecting and cleaning of work area including tools, equipment and facilities. Storage and checking of tools/equipment and disposal of used materials are also incorporated in this competency

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized</i> terms are elaborated in the Range of Variables
1. Inspect/clean tools and work area	1.1 Cleaning solvent used as per workshop/tools <b><i>cleaning requirement</i></b> 1.2 <b><i>Work area</i></b> is checked and cleaned 1.3 Wet surface/spot in work area is wiped and dried
2. Store/arrange tools and shop equipment	2.1 Tools/equipment are checked and stored in their respective shelves/location 2.2 Corresponding labels are posted and visible 2.3 Tools are safely secured and logged in the records
3. Dispose wastes/used lubricants	3.1 Containers for used lubricants are visibly labeled 3.2 Wastes/used lubricants are disposed as per workshop SOP
4. Report damaged tools/equipment	4.1 Complete inventory of tools/equipment is maintained 4.2 Damaged tools/equipment/facilities are identified and repair recommendation is given 4.3 Reports prepared has no error/discrepancy

## RANGE OF VARIABLES

VARIABLE	RANGE
1. Cleaning requirement	1.1 Cleaning solvent 1.2 Inventory of supplies, tools, equipment, facilities 1.3 List of mechanics/technicians 1.4 Rags 1.5 Broom 1.6 Map 1.7 Pail 1.8 Used oil container 1.9 Oiler 1.10 Dust/waste bin
2. Work Area	Work areas include: 2.1 Workshop areas for assembly of automotive vehicle and/or outdoor power equipment 2.2 Open workshop and enclosed, ventilated office area 2.3 Other variables may include workshop with: <ul style="list-style-type: none"> <li>• Mess hall</li> <li>• Wash room</li> <li>• Comfort room</li> </ul>

## EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Cleaned workshop tools/facilities 1.2 Maintained equipment, tools and facilities 1.3 Disposed wastes and used lubricants/fluid as per required procedure
2. Underpinning knowledge and attitudes	2.1 5S or TQM 2.2 Service procedures 2.3 Relevant technical information 2.4 Safe handling of Equipment and tools 2.5 Vehicle safety requirements 2.6 Workshop policies 2.7 Personal safety procedures 2.8 Fire Extinguishers and prevention 2.9 Storage/Disposal of Hazardous/flammable materials 2.10 Positive Work Values (Perseverance, Honesty, Patience, Attention to Details)
3. Underpinning skills	3.1 Handling/Storing of tools/equipment/supplies and material 3.2 Cleaning grease/lubricants 3.3 Disposing of wastes and fluid 3.4 Preparing inventory of s/m and tools and equipment 3.5 Monitoring of s/m and tools/equipment
4. Resource implications	The following resources <b>MUST</b> be provided: 4.1 Workplace: Real or simulated work area 4.2 Appropriate Tools & equipment 4.3 Materials relevant to the activity
5. Method of assessment	Competency <b>MUST</b> be assessed through: 5.1 Written/Oral Questioning 5.2 Demonstration 5.3 Assessment of underpinning knowledge and practical skills may be combined.
6. Context of assessment	6.1 Competency must be assessed on the job or simulated environment. 6.2 The assessment of practical skills must take place after a period of supervised practice and repetitive experience.

## CORE COMPETENCIES

**UNIT OF COMPETENCY :** RECTIFY FAULTS ON INSTALLED ELECTRICAL PARTS TO ENGINE ASSEMBLY

**UNIT CODE :** ALT827314

**UNIT DESCRIPTOR :** This unit specifies the competency required to rectify faults on installed electrical parts to engine assembly based on recommendations from the inspection records and report of the fully assembled vehicle.  
The unit includes location, diagnosis and rectification of the faults in an off-line environment.

ELEMENT	PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables
1. Plan and prepare for work	<p>1.1 <b>Planning and preparation</b> of work instruction including relevant inspection reports and forms and quality requirements are obtained, confirmed and applied</p> <p>1.2 <b>Occupational health and safety (OH &amp; S) requirements</b> are followed in accordance with company safety policies and procedures.</p> <p>1.3 <b>Tools and equipment</b> selected to carry out tasks are consistent with the requirements of the job, checked for serviceability and any faults are rectified or reported prior to commencement.</p> <p>1.4 <b>Materials</b> appropriate to the work application are identified, obtained, prepared, safely handled and located ready for use.</p> <p>1.5 <b>Working environment</b> considerations are identified and measures to reduce noise, dust and obstacles are applied.</p>
2. Diagnose and rectify electrical faults	<p>2.1 Final report is interpreted and fault located on <b>assembled vehicle</b></p> <p>2.2 <b>Electrical fault</b> is diagnosed and suitable method of correction planned</p> <p>2.3 Rectification is applied, dependent on the fault and in accordance with <b>engineering manuals</b></p> <p>2.4 Fault is re-diagnosed to assess outcome of rectification and to ensure rework has eliminated the fault and final adjustments made</p> <p>2.5 Documentation is completed outlining nature of problem, work conducted and outcome, in accordance with enterprise requirements</p> <p>2.6 Vehicle is returned to production line</p>
3. Clean up work area	<p>3.1 Work area is cleared and materials disposed of, reused or recycled in accordance with enterprise requirements</p> <p>3.2 Tools and equipment are cleaned, checked, maintained and stored in accordance with enterprise requirements</p>

## RANGE OF VARIABLES

VARIABLE	RANGE
1. Planning and preparation	Planning and preparation is to include but not be limited to: 1.1 Vehicle inspection 1.2 Defect identification 1.3 Assessment of conditions and hazards 1.4 Determination of work requirements
2. Occupational Health and Safety (OH & S) Requirements	OH&S requirements are to be in accordance with Legislation / regulations / codes of practice and company safety policies and procedures. This may include but not limited to: 3.1 Protective clothing and equipment like hard hat, safety shoes, gloves, earplug, goggles 3.2 Proper use of tools and equipment 3.3 Workplace environment and safety 3.4 Handling of materials 3.5 Use of fire fighting equipment 3.6 Company first aid 3.7 Hazard control and hazardous materials and substances 3.8 Personal protective equipment is to include that prescribed under legislation/regulation/codes of practice and workplace policies and practices 3.9 Safe operating procedures are to include but not be limited to the conduct of operational risk assessment and treatments associated with heavy objects, vehicular movement, toxic substances, electrical shock, machinery movement and operation, production line operation, manual and mechanical lifting and shifting, working in proximity to others and site visitors 3.10 Emergency procedures related to this unit are to include but may not be limited to emergency shutdown and stopping of equipment, extinguishing fires, enterprise first aid requirements and plant evacuation
3. Tools and Equipment	Tools and equipment are to include but not be limited to: 4.1 Hand and power tools 4.2 Electrical diagnostic equipment
4. Materials	Materials are to include but not be limited to Assembly line consumables and parts
5. Working Environment	Working environment requirements include management of : 6.1 Waste 6.2 Noise 6.3 Dust 6.4 Vibration 6.5 Workplace Housekeeping (Clean-up)
6. Electrical Fault	6.1 Engine not starting due to defective starter, alternator 6.2 No current flow due to loose wiring connections 6.3 Electronic fuel injection unit malfunction 6.4 Ignition system malfunctioning

7. Engineering Manuals	Engineering manuals are to include but not be limited to: 7.1 Vehicle assembly manuals per model-variant 7.2 Vehicle quality standard manuals per model-variant 7.3 Process control Chart/sheets 7.4 Vehicle Specification sheets 7.5 Materials/Parts list
8. Assembled Vehicle	8.1 Passenger Car 8.2 Utility Vehicle

## EVIDENCE GUIDE

<p>1. Critical aspects of competency</p>	<p>Assessment requires evidence that the candidate:</p> <p>1.1 Located, interpreted and applied the relevant information, standards and specifications.</p> <p>1.2 Complied with company safety policies and procedures and OH&amp;S legislation/regulations/codes of practice applicable to operations including quality requirements</p> <p>1.3 Completed diagnosis, rectification and re-assembly of electrical faults rectified to engineering specifications and enterprise inspection requirements on a minimum of three (3) separate vehicles each with different faults including those requiring:</p> <ul style="list-style-type: none"> <li>▪ The removal and re-assembly of the instrument panel</li> <li>▪ The disassembly and re-assembly of all electrical parts</li> <li>▪ The replacement of defective electrical parts and components</li> </ul> <p>1.4 Communicated and worked effectively and safely with others</p>
<p>2. Underpinning knowledge and attitudes</p>	<p>2.1 Workplace and equipment safety requirements</p> <p>2.2 Relevant enterprise production quality standards</p> <p>2.3 Enterprise manufacturing and production techniques for mechanical components and systems</p> <p>2.4 Automotive Industry terminology</p> <p>2.5 Tools and equipment types, characteristics, uses and limitations</p> <p>2.6 Electrical faults symptoms and diagnosis techniques</p> <p>2.7 Processes for the calculation of material requirements</p> <p>2.8 Material Safety Data Sheets</p> <p>2.9 Plans, drawings and specifications</p> <p>2.10 Materials handling, storage and environment-friendly waste management</p> <p>2.11 Company safety policies and procedures</p> <p>2.12 Relevant Philippine Standards and OH&amp;S</p> <p>2.13 Positive Work Values (Patience, Perseverance, Honesty, etc.)</p>
<p>3. Underpinning skills</p>	<p>3.1 Collect, organize, interpret and understand the information required for electrical rectification, including work instructions, plans / sketches / diagrams, safety instructions, signage, labels, quality procedures, material safety data sheets and equipment instructions</p> <p>3.2 Communicate ideas and information orally and in writing, in simple English to enable confirmation of work requirements, passage of information and requests to other workers during operations and the reporting and recording of work outcomes</p> <p>3.3 Conduct activities associated with assembly and sealing system rectification, including the coordination and use of equipment, materials and tools to avoid backtracking and rework</p> <p>3.4 Work with others and in a team by recognizing dependencies and using co-operative approaches to optimize satisfaction and productivity</p> <p>3.5 Establish safe and effective work processes which anticipate and/or resolve problems and downtime, to systematically develop solutions to avoid or minimize reworking and avoid wastage</p> <p>3.6 Use mathematical ideas and techniques to correctly calculate time, assess tolerances and timing, apply accurate measurements, and establish quality checks</p> <p>3.7 Use workplace technology related to assembly and rectification, including the use of computers, measuring equipment,</p>

	computerized equipment, electrical diagnostic equipment, the use of communication devices and the reporting / recording of results
4. Resource implications	The following resources <b>MUST</b> be provided: 4.1 Assembled vehicles and parts/materials relevant with the requirements for the job. 4.2 Tools, equipment and workplace relevant with the requirements for the job. 4.3 Supplies and consumable materials 4.4 Engineering manuals
5. Method of assessment	Competency <b>MUST</b> be assessed through 5.1 Observation with questioning 5.2 Portfolio assessment
6. Context of assessment	Competency may be assessed individually in the actual workplace or a simulated workplace environment.

**UNIT OF COMPETENCY : RECTIFY FAULTS ON INSTALLED ELECTRICAL PARTS AND ELECTRONIC UNITS TO BODY INTERIOR COMPARTMENT**

**UNIT CODE : ALT827315**

**UNIT DESCRIPTOR :** This unit specifies the competency required to rectify faults on installed electrical parts and electronic units to body interior compartment based on recommendations from the inspection records and report of the fully assembled vehicle. The unit includes location, diagnosis and rectification of the faults in an off-line environment.

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized terms</i> are elaborated in the Range of Variables
1. Plan and prepare for work	1.1 <b>Planning and preparation</b> of work instruction including relevant inspection reports and forms and quality requirements are obtained, confirmed and applied 1.2 <b>Occupational health and safety (OH &amp; S) requirements</b> are followed in accordance with company safety policies and procedures. 1.3 <b>Tools and equipment</b> selected to carry out tasks are consistent with the requirements of the job, checked for serviceability and any faults are rectified or reported prior to commencement. 1.4 <b>Materials</b> appropriate to the work application are identified, obtained, prepared, safely handled and located ready for use. 1.5 <b>Working environment</b> considerations are identified and measures to reduce noise, dust and obstacles are applied.
2. Diagnose and rectify electrical fault	2.1 Inspection report is interpreted and fault is located on <b>assembled vehicle</b> 2.2 <b>Electrical Fault</b> is diagnosed and suitable method of correction is planned. 2.3 Rectification is applied, dependent on the fault and in accordance with <b>engineering manuals</b> 2.4 Fault is re-diagnosed to assess outcome of rectification and to ensure rework has eliminated the fault and final adjustments made 2.5 Documentation is completed outlining nature of problem, work conducted and outcome, in accordance with enterprise requirements 2.6 Vehicle is returned to production sequence
3. Clean up work area	3.1 Work area is cleared and materials disposed of, reused or recycled in accordance with enterprise requirements 3.2 Tools and equipment are cleaned, checked, maintained and stored in accordance with enterprise requirements

## RANGE OF VARIABLES

VARIABLE	RANGE
1. Planning and preparation	Planning and preparation is to include but not be limited to: 1.1 Vehicle inspection 1.2 Defect identification 1.3 Assessment of conditions and hazards 1.4 Determination of work requirements
2. Occupational Health and Safety (OH & S) Requirements	OH&S requirements are to be in accordance with Legislation / regulations / codes of practice and company safety policies and procedures. This may include but not limited to: 2.1 Protective clothing and equipment like hard hat, safety shoes, gloves, earplug, goggles 2.2 Proper use of tools and equipment 2.3 Workplace environment and safety 2.4 Handling of materials 2.5 Use of fire fighting equipment 2.6 Company first aid 2.7 Hazard control and hazardous materials and substances 2.8 Personal protective equipment is to include that prescribed under legislation/regulation/codes of practice and workplace policies and practices 2.9 Safe operating procedures are to include but not be limited to the conduct of operational risk assessment and treatments associated with heavy objects, vehicular movement, toxic substances, electrical shock, machinery movement and operation, production line operation, manual and mechanical lifting and shifting, working in proximity to others and site visitors 2.10 Emergency procedures related to this unit are to include but may not be limited to emergency shutdown and stopping of equipment, extinguishing fires, enterprise first aid requirements and plant evacuation
3. Tools and Equipment	Tools and equipment are to include but not be limited to 3.1 Mechanical diagnostic equipment 3.2 Hand and power tools
4. Materials	Materials are to include but not be limited to: 4.1 Replacement 4.2 Parts 4.3 Fuel 4.4 Oil 4.5 Water 4.6 Seals 4.7 Gaskets 4.8 Brake fluids 4.9 Lubricants 4.10 Gas

5. Working environment	Working environment requirements include management of : 5.1 Waste 5.2 Noise 5.3 Dust 5.4 Vibration 5.5 Workplace Housekeeping (Clean-up)
6. Assembled vehicle	6.1 Passenger Car 6.2 Utility Vehicle
7. Electrical faults	Rectification of electrical faults may include but not be limited to detection of faults such as: 7.1 Loose wiring connection on main wiring with fuse and relay, on door wiring, on roof wiring, on package tray wiring, on defogger wire 7.2 Busted fuse and relay 7.3 Defective lamp assembly like luggage compartment, roof and door lamps, reading map lamps 7.4 Electronic computer control system malfunction
8. Engineering Manuals	Engineering manuals are to include but not be limited to: 8.1 Vehicle assembly manuals per model-variant 8.2 Vehicle quality standard manuals per model-variant 8.3 Process control Chart/sheets 8.4 Vehicle Specification sheets 8.5 Materials/Parts list

## EVIDENCE GUIDE

<p>1. Critical aspects of competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Located, interpreted and applied the relevant information, standards and specifications.</li> <li>1.2 Complied with company safety policies and procedures and OH&amp;S legislation/regulations/codes of practice applicable to operations including quality requirements</li> <li>1.3 Completed diagnosis and rectification of electrical faults on a minimum of three (3) separate vehicles each with different faults, rectified to engineers specifications and enterprise inspection requirements</li> <li>1.4 Communicated and worked effectively and safely with others</li> </ul>
<p>2. Underpinning knowledge and attitudes</p>	<ul style="list-style-type: none"> <li>2.1 Workplace and equipment safety requirements</li> <li>2.2 Relevant company production quality standards</li> <li>2.3 Company manufacturing and production techniques for electrical components and systems</li> <li>2.4 Automotive Industry terminology</li> <li>2.5 Tools and equipment types, characteristics, uses and limitations</li> <li>2.6 Electrical faults and symptoms</li> <li>2.7 Electrical diagnosis techniques</li> <li>2.8 Processes for the calculation of material requirements</li> <li>2.9 Material Safety Data Sheets</li> <li>2.10 Plans, drawings and specifications</li> <li>2.11 Materials handling, storage and environment-friendly waste management</li> <li>2.12 Company safety policies and procedures</li> <li>2.13 Relevant Philippine Standards OH&amp;S legislation</li> </ul>

<p>3. Underpinning skills</p>	<p>3.1 Collect, organize, interpret and understand the information required for mechanical rectification, including work instructions, plans / sketches / diagrams, safety instructions, signage, labels, quality procedures, material safety data sheets and equipment instructions</p> <p>3.2 Communicate ideas and information orally and in writing, in simple English to enable confirmation of work requirements, passage of information and requests to other workers during operations and the reporting and recording of work outcomes</p> <p>3.3 Conduct activities associated with electrical rectification, including the coordination and use of equipment, materials and tools to avoid backtracking and rework</p> <p>3.4 Work with others and in a team by recognizing dependencies and using co-operative approaches to optimize satisfaction and productivity</p> <p>3.5 Establish safe and effective work processes which anticipate and/or resolve problems and downtime, to systematically develop solutions to avoid or minimize reworking and avoid wastage</p> <p>3.6 Use mathematical ideas and techniques to correctly calculate time, assess tolerances and timing, apply accurate measurements, and establish quality checks</p> <p>3.7 Use workplace technology related to electrical rectification, including the use of computers, measuring equipment, computerized equipment, electrical diagnostic equipment, the use of communication devices and the reporting/recording of results</p>
<p>4. Resource implications</p>	<p>The following resources <b>MUST</b> be provided:</p> <p>4.1 Assembled vehicles and parts/materials relevant with the requirements for the job.</p> <p>4.2 Tools, equipment and workplace relevant with the requirements for the job.</p> <p>4.3 Supplies and consumable materials</p> <p>4.4 Engineering manuals</p>
<p>5. Method of assessment</p>	<p>Competency <b>MUST</b> be assessed through</p> <p>5.1 Direct Observation with questioning</p> <p>5.2 Portfolio assessment</p>
<p>6. Context of assessment</p>	<p>Competency may be assessed individually in the actual workplace or a simulated workplace environment.</p>

**UNIT OF COMPETENCY : RECTIFY FAULT ON INSTALLED ELECTRICAL PARTS AND ELECTRONIC UNITS TO DASH INSTRUMENT PANEL**

**UNIT CODE : ALT827316**

**UNIT DESCRIPTOR :** This unit specifies the competency required to rectify faults on installed electrical parts and electronic units to dash instrument panel based on recommendations from the inspection records and report of the fully assembled vehicle. The unit includes location, diagnosis and rectification of the faults in an off-line environment.

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized terms</i> are elaborated in the Range of Variables
1. Plan and prepare for work	1.1 <b>Planning and preparation</b> of work instruction including relevant inspection reports and forms and quality requirements are obtained, confirmed and applied 1.2 <b>Occupational health and safety (OH &amp; S) requirements</b> are followed in accordance with company safety policies and procedures. 1.3 <b>Tools and equipment</b> selected to carry out tasks are consistent with the requirements of the job, checked for serviceability and any faults are rectified or reported prior to commencement. 1.4 <b>Materials</b> appropriate to the work application are identified, obtained, prepared, safely handled and located ready for use. 1.5 <b>Working environment</b> considerations are identified and measures to reduce noise, dust and obstacles are applied.
2. Diagnose and rectify electrical fault	2.1 Inspection report is interpreted and fault is located on <b>assembled vehicle</b> 2.2 <b>Electrical fault</b> is diagnosed and suitable method of correction is planned. 2.3 Rectification is applied, dependent on the fault and in accordance with <b>engineering manuals</b> 2.4 Fault is re-diagnosed to assess outcome of rectification and to ensure rework has eliminated the fault and final adjustments made 2.5 Documentation is completed outlining nature of problem, work conducted and outcome, in accordance with company requirements 2.6 Vehicle is returned to production sequence
3. Clean up work area	3.1 Work area is cleared and materials disposed of, reused or recycled in accordance with enterprise requirements 3.2 Tools and equipment are cleaned, checked, maintained and stored in accordance with enterprise requirements

## RANGE OF VARIABLES

VARIABLE	RANGE
1. Planning and preparation	Planning and preparation is to include but not be limited to: 1.1 Vehicle inspection 1.2 Defect identification 1.3 Assessment of conditions and hazards 1.4 Determination of work requirements
2. Occupational Health and Safety (OH &S) Requirements	OH&S requirements are to be in accordance with Legislation / regulations / codes of practice and company safety policies and procedures. This may include but not limited to: 2.1 Protective clothing and equipment like hard hat, safety shoes, gloves, earplug, goggles 2.2 Proper use of tools and equipment 2.3 Workplace environment and safety 2.4 Handling of materials 2.5 Use of fire fighting equipment 2.6 Company first aid 2.7 Hazard control and hazardous materials and substances 2.8 Personal protective equipment is to include that prescribed under legislation/regulation/codes of practice and workplace policies and practices 2.9 Safe operating procedures are to include but not be limited to the conduct of operational risk assessment and treatments associated with heavy objects, vehicular movement, toxic substances, electrical shock, machinery movement and operation, production line operation, manual and mechanical lifting and shifting, working in proximity to others and site visitors 2.10 Emergency procedures related to this unit are to include but may not be limited to emergency shutdown and stopping of equipment, extinguishing fires, enterprise first aid requirements and plant evacuation
3. Tools and equipment	Tools and equipment are to include but not be limited to 3.1 Mechanical diagnostic equipment 3.2 Hand and power tools
4. Materials	Materials are to include but not be limited to 4.1 Replacement parts 4.2 Fuel 4.3 Oil 4.4 Water 4.5 Seals 4.6 Gaskets 4.7 Brake fluids 4.8 Lubricants 4.9 Gas

5. Working environment	Working environment requirements include management of : 5.1 Waste 5.2 Noise 5.3 Dust 5.4 Vibration 5.5 Workplace Housekeeping (Clean-up)
6. Electrical fault	Rectification of electrical faults may include but not be limited to detection of faults such as: 6.1 Defective panel instrument wiring harness 6.2 Combination meter malfunction 6.3 Electrical switches malfunction like hazard, defogger, park light, turn signal, headlamp, windshield washer and fog lamp 6.4 Air conditioning control switch malfunction 6.5 Busted relays and fuses
7. Assembled vehicle	7.1 Passenger Car 7.2 Utility Vehicle
8. Engineering Manuals	Engineering manuals are to include but not be limited to: 8.1 Vehicle assembly manuals per model-variant 8.2 Vehicle quality standard manuals per model-variant 8.3 Process control Chart/sheets 8.4 Vehicle Specification sheets 8.5 Materials/Parts list

## EVIDENCE GUIDE

<p>1. Critical aspects of competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Located, interpreted and applied the relevant information, standards and specifications.</li> <li>1.2 Complied with company safety policies and procedures and OH&amp;S legislation/regulations/codes of practice applicable to operations including quality requirements</li> <li>1.3 Completed diagnosis and rectification of electrical faults on a minimum of three (3) separate vehicles each with different faults, rectified to engineers specifications and company inspection requirements</li> <li>1.4 Communicated and worked effectively and safely with others</li> </ul>
<p>2. Underpinning knowledge and attitudes</p>	<ul style="list-style-type: none"> <li>2.1 Workplace and equipment safety requirements</li> <li>2.2 Relevant company production quality standards</li> <li>2.3 Company manufacturing and production techniques for mechanical components and systems</li> <li>2.4 Automotive Industry terminology</li> <li>2.5 Tools and equipment types, characteristics, uses and limitations</li> <li>2.6 Electrical faults and symptoms</li> <li>2.7 Electrical diagnosis techniques</li> <li>2.8 Processes for the calculation of material requirements</li> <li>2.9 Material Safety Data Sheets</li> <li>2.10 Plans, drawings and specifications</li> <li>2.11 Materials handling, storage and environmentally-friendly waste management</li> <li>2.12 Company safety policies and procedures</li> <li>2.13 Relevant Philippine Standards OH&amp;S legislation</li> </ul>

<p>3. Underpinning skills</p>	<p>3.1 Collect, organize, interpret and understand the information required for mechanical rectification, including work instructions, plans / sketches / diagrams, safety instructions, signage, labels, quality procedures, material safety data sheets and equipment instructions</p> <p>3.2 Communicate ideas and information orally and in writing, in simple English to enable confirmation of work requirements, passage of information and requests to other workers during operations and the reporting and recording of work outcomes</p> <p>3.3 Conduct activities associated with mechanical rectification, including the coordination and use of equipment, materials and tools to avoid backtracking and rework</p> <p>3.4 Work with others and in a team by recognizing dependencies and using co-operative approaches to optimize satisfaction and productivity</p> <p>3.5 Establish safe and effective work processes which anticipate and/or</p> <p>3.6 resolve problems and downtime, to systematically develop solutions to avoid or minimize reworking and avoid wastage</p> <p>3.7 Use mathematical ideas and techniques to correctly calculate time, assess tolerances and timing, apply accurate measurements, and establish quality checks</p> <p>3.8 Use workplace technology related to mechanical rectification, including the use of computers, measuring equipment, computerized equipment, mechanical diagnostic equipment, the use of communication devices and the reporting/recording of results</p>
<p>4. Resource implications</p>	<p>The following resources <b>MUST</b> be provided:</p> <p>4.1 Assembled vehicles and parts/materials relevant with the requirements for the job.</p> <p>4.2 Tools, equipment and workplace relevant with the requirements for the job.</p> <p>4.3 Supplies and consumable materials</p> <p>4.4 Engineering manuals</p>
<p>5. Method of assessment</p>	<p>Competency <b>MUST</b> be assessed through</p> <p>5.1 Direct Observation with questioning</p> <p>5.2 Portfolio assessment</p>
<p>6. Context of assessment</p>	<p>Competency may be assessed individually in the actual workplace or a simulated workplace environment.</p>

**UNIT OF COMPETENCY : RECTIFY FAULT ON INSTALLED ELECTRICAL PARTS TO EXTERIOR AND ENGINE COMPARTMENT**

**UNIT CODE : ALT827317**

**UNIT DESCRIPTOR :** This unit specifies the competency required to rectify fault on installed electrical parts to exterior and engine compartment based on recommendations from the inspection records and report of the fully assembled vehicle. The unit includes location, diagnosis and rectification of the faults in an off-line environment.

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized terms</i> are elaborated in the Range of Variables
1. Plan and prepare for work	1.1 <b>Planning and preparation</b> of work instruction including relevant inspection reports and forms and quality requirements are obtained, confirmed and applied 1.2 <b>Occupational health and safety (OH &amp; S) requirements</b> are followed in accordance with company safety policies and procedures. 1.3 <b>Tools and equipment</b> selected to carry out tasks are consistent with the requirements of the job, checked for serviceability and any faults are rectified or reported prior to commencement. 1.4 <b>Materials</b> appropriate to the work application are identified, obtained, prepared, safely handled and located ready for use. 1.5 <b>Working environment</b> considerations are identified and measures to reduce noise, dust and obstacles are applied.
2. Diagnose and rectify electrical fault	2.1 Inspection report is interpreted and fault is located on <b>assembled vehicle</b> 2.2 <b>Electrical fault</b> is diagnosed and suitable method of correction is planned. 2.3 Rectification is applied, dependent on the fault and in accordance with <b>engineering manuals</b> 2.4 Fault is re-diagnosed to assess outcome of rectification and to ensure rework has eliminated the fault and final adjustments made 2.5 Documentation is completed outlining nature of problem, work conducted and outcome, in accordance with enterprise requirements 2.6 Vehicle is returned to production sequence
3. Clean up work area	3.1 Work area is cleared and materials disposed of, reused or recycled in accordance with enterprise requirements 3.2 Tools and equipment are cleaned, checked, maintained and stored in accordance with enterprise requirements

VARIABLE	RANGE
1. Planning and preparation	Planning and preparation is to include but not be limited to: 1.1 Vehicle inspection 1.2 Defect identification 1.3 Assessment of conditions and hazards 1.4 Determination of work requirements
2. Occupational Health and Safety (OH &S) Requirements	OH&S requirements are to be in accordance with Legislation / regulations / codes of practice and company safety policies and procedures. This may include but not limited to: 2.1 Protective clothing and equipment like hard hat, safety shoes, gloves, earplug, goggles 2.2 Proper use of tools and equipment 2.3 Workplace environment and safety 2.4 Handling of materials 2.5 Use of fire fighting equipment 2.6 Company first aid 2.7 Hazard control and hazardous materials and substances 2.8 Personal protective equipment is to include that prescribed under legislation/regulation/codes of practice and workplace policies and practices 2.9 Safe operating procedures are to include but not be limited to the conduct of operational risk assessment and treatments associated with heavy objects, vehicular movement, toxic substances, electrical shock, machinery movement and operation, production line operation, manual and mechanical lifting and shifting, working in proximity to others and site visitors 2.10 Emergency procedures related to this unit are to include but may not be limited to emergency shutdown and stopping of equipment, extinguishing fires, enterprise first aid requirements and plant evacuation
3. Tools and equipment	Tools and equipment are to include but not be limited to 3.1 Mechanical diagnostic equipment 3.2 Hand and power tools
4. Materials	Materials are to include but not be limited to 4.1 Replacement parts 4.2 Fuel 4.3 Oil 4.4 Water 4.5 Seals 4.6 Gaskets 4.7 Brake fluids 4.8 Lubricants 4.9 Gas

5. Working environment	Working environment requirements include management of : 5.1 Waste 5.2 Noise 5.3 Dust 5.4 Vibration 5.5 Workplace Housekeeping (Clean-up)
6. Electrical fault	Rectification of electrical faults may include but not be limited to detection of faults such as: 6.1 Defective engine room wiring harness with fuse / relay boxes 6.2 Voltage regulator malfunction 6.3 Defective battery, headlights, park lights, rear combination lamps, front turn signal lights, third brake lamp
7. Assembled vehicle	7.1 Passenger Car 7.2 Utility Vehicle
8. Engineering Manuals	Engineering manuals are to include but not be limited to: 8.1 Vehicle assembly manuals per model-variant 8.2 Vehicle quality standard manuals per model-variant 8.3 Process control Chart/sheets 8.4 Vehicle Specification sheets 8.5 Materials/Parts list

## EVIDENCE GUIDE

<p>1. Critical aspects of competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Located, interpreted and applied the relevant information, standards and specifications.</li> <li>1.2 Complied with company safety policies and procedures and OH&amp;S legislation/regulations/codes of practice applicable to operations including quality requirements</li> <li>1.3 Completed diagnosis and rectification of mechanical faults on a minimum of five (3) separate vehicles each with different faults, rectified to engineers specifications and enterprise inspection requirements</li> <li>1.4 Communicated and worked effectively and safely with other</li> </ul>
<p>2. Underpinning knowledge and attitudes</p>	<ul style="list-style-type: none"> <li>2.1 Workplace and equipment safety requirements</li> <li>2.2 Relevant Company production quality standards</li> <li>2.3 Company manufacturing and production techniques for mechanical components and systems</li> <li>2.4 Automotive Industry terminology</li> <li>2.5 Tools and equipment types, characteristics, uses and limitations</li> <li>2.6 Electrical faults and symptoms</li> <li>2.7 Electrical diagnosis techniques</li> <li>2.8 Processes for the calculation of material requirements</li> <li>2.9 Material Safety Data Sheets</li> <li>2.10 Plans, drawings and specifications</li> <li>2.11 Materials handling, storage and environmentally friendly waste management</li> <li>2.12 Company safety policies and procedures</li> <li>2.13 Relevant Philippine Standards OH&amp;S legislation</li> </ul>
<p>3. Underpinning skills</p>	<ul style="list-style-type: none"> <li>3.1 Collect, organize, interpret and understand the information required for mechanical rectification, including work instructions, plans / sketches / diagrams, safety instructions, signage, labels, quality procedures, material safety data sheets and equipment instructions</li> <li>3.2 Communicate ideas and information orally and in writing, in simple English to enable confirmation of work requirements, passage of information and requests to other workers during operations and the reporting and recording of work outcomes</li> <li>3.3 Conduct activities associated with mechanical rectification, including the coordination and use of equipment, materials and tools to avoid backtracking and rework</li> <li>3.4 Work with others and in a team by recognizing dependencies and using co-operative approaches to optimize satisfaction and productivity</li> <li>3.5 Establish safe and effective work processes which anticipate and/or resolve problems and downtime, to systematically develop solutions to avoid or minimize reworking and avoid wastage</li> <li>3.6 Use mathematical ideas and techniques to correctly calculate time, assess tolerances and timing, apply accurate measurements, and establish quality checks</li> <li>3.7 Use workplace technology related to mechanical rectification, including the use of computers, measuring equipment, computerized equipment, mechanical diagnostic equipment, the use of communication devices and the reporting/recording of results</li> </ul>

4. Resource implications	The following resources <b>MUST</b> be provided: 4.1 Assembled vehicles and parts/materials relevant with the requirements for the job. 4.2 Tools, equipment and workplace relevant with the requirements for the job. 4.3 Supplies and consumable materials 4.4 Engineering manuals
5. Method of assessment	Competency <b>MUST</b> be assessed through 5.1 Observation with questioning 5.2 Portfolio assessment
6. Context of assessment	Competency may be assessed individually in the actual workplace or a simulated workplace environment.

**UNIT OF COMPETENCY : RECTIFY FAULT ON INSTALLED AUDIO AND VIDEO SYSTEM TO AUTOMOTIVE VEHICLE**

**UNIT CODE : ALT827318**

**UNIT DESCRIPTOR :** This unit specifies the competency required to rectify fault on installed audio and video system to automotive vehicle based on recommendations from the inspection records and report of the fully assembled vehicle. The unit includes location, diagnosis and rectification of the faults in an off-line environment.

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized terms</i> are elaborated in the Range of Variables
1. Plan and prepare for work	1.1 <b>Planning and preparation</b> of work instruction including relevant inspection reports and forms and quality requirements are obtained, confirmed and applied 1.2 <b>Occupational health and safety (OH &amp; S) requirements</b> are followed in accordance with company safety policies and procedures. 1.3 <b>Tools and equipment</b> selected to carry out tasks are consistent with the requirements of the job, checked for serviceability and any faults are rectified or reported prior to commencement. 1.4 <b>Materials</b> appropriate to the work application are identified, obtained, prepared, safely handled and located ready for use. 1.5 <b>Working environment</b> considerations are identified and measures to reduce noise, dust and obstacles are applied.
2. Diagnose and rectify electrical fault	2.1 Inspection report is interpreted and fault is located on <b>assembled vehicle</b> 2.2 <b>Electrical fault</b> is diagnosed and suitable method of correction is planned. 2.3 Rectification is applied, dependent on the fault and in accordance with <b>engineering manuals</b> 2.4 Fault is re-diagnosed to assess outcome of rectification and to ensure rework has eliminated the fault and final adjustments made 2.5 Documentation is completed outlining nature of problem, work conducted and outcome, in accordance with enterprise requirements 2.6 Vehicle is returned to production sequence
3. Clean up work area	3.1 Work area is cleared and materials disposed of, reused or recycled in accordance with enterprise requirements 3.2 Tools and equipment are cleaned, checked, maintained and stored in accordance with enterprise requirements

## RANGE OF VARIABLES

VARIABLE	RANGE
1. Planning and preparation	Planning and preparation is to include but not be limited to: 1.1 Vehicle inspection 1.2 Defect identification 1.3 Assessment of conditions and hazards 1.4 Determination of work requirements
2. Occupational Health and Safety (OH &S) Requirements	OH&S requirements are to be in accordance with Legislation / regulations / codes of practice and company safety policies and procedures. This may include but not limited to: 2.1 Protective clothing and equipment like hard hat, safety shoes, gloves, earplug, goggles 2.2 Proper use of tools and equipment 2.3 Workplace environment and safety 2.4 Handling of materials 2.5 Use of fire fighting equipment 2.6 Company first aid 2.7 Hazard control and hazardous materials and substances 2.8 Personal protective equipment is to include that prescribed under legislation/regulation/codes of practice and workplace policies and practices 2.9 Safe operating procedures are to include but not be limited to the conduct of operational risk assessment and treatments associated with heavy objects, vehicular movement, toxic substances, electrical shock, machinery movement and operation, production line operation, manual and mechanical lifting and shifting, working in proximity to others and site visitors 2.10 Emergency procedures related to this unit are to include but may not be limited to emergency shutdown and stopping of equipment, extinguishing fires, enterprise first aid requirements and plant evacuation
3. Tools and equipment	Tools and equipment are to include but not be limited to 3.1 Mechanical diagnostic equipment 3.2 Hand and power tools
4. Materials	Materials are to include but not be limited to 4.1 Replacement parts 4.2 Fuel 4.3 Oil 4.4 Water 4.5 Seals 4.6 Gaskets 4.7 Brake fluids 4.8 Lubricants 4.9 Gas

5. Working environment	Working environment requirements include management of : 5.1 Waste 5.2 Noise 5.3 Dust 5.4 Vibration 5.5 Workplace Housekeeping (Clean-up)
6. Electrical fault	Rectification of audio and video system faults may include but not be limited to detection of faults such as: 6.1 Radio malfunction and with abnormal noise 6.2 Defective speakers, amplifier 6.3 Cables and wiring disconnection 6.4 Video not properly functioning especially hazy picture quality
7. Assembled vehicle	7.1 Passenger Car 7.2 Utility Vehicle
8. Engineering Manuals	Engineering manuals are to include but not be limited to: 8.1 Vehicle assembly manuals per model-variant 8.2 Vehicle quality standard manuals per model-variant 8.3 Process control Chart/sheets 8.4 Vehicle Specification sheets 8.5 Materials/Parts list

## EVIDENCE GUIDE

<p>1. Critical aspects of competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Located, interpreted and applied the relevant information, standards and specifications.</li> <li>1.2 Complied with company safety policies and procedures and OH&amp;S legislation/regulations/codes of practice applicable to operations including quality requirements</li> <li>1.3 Completed diagnosis and rectification of mechanical faults on a minimum of five (3) separate vehicles each with different faults, rectified to engineers specifications and enterprise inspection requirements</li> <li>1.4 Communicated and worked effectively and safely with other</li> </ul>
<p>2. Underpinning knowledge and attitudes</p>	<ul style="list-style-type: none"> <li>2.1 Workplace and equipment safety requirements</li> <li>2.2 Relevant enterprise production quality standards</li> <li>2.3 Company manufacturing and production techniques for mechanical components and systems</li> <li>2.4 Automotive Industry terminology</li> <li>2.5 Tools and equipment types, characteristics, uses and limitations</li> <li>2.6 Electrical faults and symptoms</li> <li>2.7 Electrical diagnosis techniques</li> <li>2.8 Processes for the calculation of material requirements</li> <li>2.9 Material Safety Data Sheets</li> <li>2.10 Plans, drawings and specifications</li> <li>2.11 Materials handling, storage and environmentally-friendly waste management</li> <li>2.12 Company safety policies and procedures</li> <li>2.13 Relevant Philippine Standards OH&amp;S legislation</li> </ul>
<p>3. Underpinning skills</p>	<ul style="list-style-type: none"> <li>3.1 Collect, organize, interpret and understand the information required for mechanical rectification, including work instructions, plans / sketches / diagrams, safety instructions, signage, labels, quality procedures, material safety data sheets and equipment instructions</li> <li>3.2 Communicate ideas and information orally and in writing, in simple English to enable confirmation of work requirements, passage of information and requests to other workers during operations and the reporting and recording of work outcomes</li> <li>3.3 Conduct activities associated with mechanical rectification, including the coordination and use of equipment, materials and tools to avoid backtracking and rework</li> <li>3.4 Work with others and in a team by recognizing dependencies and using co-operative approaches to optimize satisfaction and productivity</li> <li>3.5 Establish safe and effective work processes which anticipate and/or resolve problems and downtime, to systematically develop solutions to avoid or minimize reworking and avoid wastage</li> <li>3.6 Use mathematical ideas and techniques to correctly calculate time, assess tolerances and timing, apply accurate measurements, and establish quality checks</li> <li>3.7 Use workplace technology related to mechanical rectification, including the use of computers, measuring equipment, computerized equipment, mechanical diagnostic equipment, the use of communication devices and the reporting/recording of results</li> </ul>

4. Resource implications	The following resources <b>MUST</b> be provided: 4.1 Assembled vehicles and parts/materials relevant with the requirements for the job. 4.2 Tools, equipment and workplace relevant with the requirements for the job. 4.3 Supplies and consumable materials 4.4 Engineering manuals
5. Method of assessment	Competency <b>MUST</b> be assessed through 5.1 Direct Observation with questioning 5.2 Portfolio assessment
6. Context of assessment	Competency may be assessed individually in the actual workplace or a simulated workplace environment.

### SECTION 3. TRAINING STANDARDS

These standards are set to provide technical and vocational education and training (TVET) providers with information and other important requirements to consider when designing training programs for Automotive Electrical Assembly NC III.

#### 3.1 CURRICULUM DESIGN

Course Title: **AUTOMOTIVE ELECTRICAL ASSEMBLY**

NC Level **NC III**

Nominal Training Duration: **20 Hours** (Basic Competencies)  
**20 Hours** (Common Competencies)  
**200 Hours** (Core Competencies)

Course Description:

This course is designed to enhance the knowledge, skills and attitudes of an individual in the field of automotive manufacturing in accordance with industry standards. It covers core competencies such as; Rectify faults on installed electrical parts to engine assembly; Rectify faults on installed electrical parts and electronic units to body interior compartment; Rectify faults on installed electrical parts and electronic units to dash instrument panel; Rectify faults on installed electrical parts to exterior and engine compartment; and Rectify faults on installed audio and video system to automotive vehicle

This course is also designed to enhance the basic and common knowledge, skills and attitudes of an individual in the field of automotive mechanical assembly.

To obtain this, all units prescribed for this qualification must be achieved.

#### BASIC COMPETENCIES

Unit of Competency	Learning Outcomes	Methodology	Assessment Approach
1. Lead workplace communication	1.1 Communicate information about workplace processes. 1.2 Lead workplace discussions. 1.3 Identify and communicate issues arising in the workplace	<ul style="list-style-type: none"> <li>• Group discussion</li> <li>• Role Play</li> <li>• Brainstorming</li> </ul>	<ul style="list-style-type: none"> <li>• Observation</li> <li>• Interviews</li> </ul>
2. Lead small teams	2.1 Provide team leadership. 2.2 Assign responsibilities among members. 2.3 Set performance expectation for team members. 2.4 Supervise team performance	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Demonstration</li> <li>• Self-paced (modular)</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstration</li> <li>• Case studies</li> </ul>
3. Develop and practice negotiation skills	3.1 Identify relevant information in planning negotiations 3.2 Participate in negotiations 3.3 Document areas for agreement	<ul style="list-style-type: none"> <li>• Direct observation</li> <li>• Simulation / role playing</li> <li>• Case studies</li> </ul>	<ul style="list-style-type: none"> <li>• Written test</li> <li>• Practical/ performance test</li> </ul>

4. Solve workplace problem related to work activities	4.1 Explain the analytical techniques. 4.2 Identify the problem. 4.3 Determine the possible cause/s of the problem.	<ul style="list-style-type: none"> <li>• Direct observation</li> <li>• Simulation/role playing</li> <li>• Case studies</li> </ul>	<ul style="list-style-type: none"> <li>• Written test</li> <li>• Practical/ performance test</li> </ul>
5. Use mathematical concepts and techniques	5.1 Identify mathematical tools and techniques to solve problem 5.2 Apply mathematical procedures/solution 5.3 Analyze results	<ul style="list-style-type: none"> <li>• Direct observation</li> <li>• Simulation/role playing</li> <li>• Case studies</li> </ul>	<ul style="list-style-type: none"> <li>• Written test</li> <li>• Practical/ performance test</li> </ul>
6. Use relevant technologies	6.1 Identify appropriate technology 6.2 Apply relevant technology 6.3 Maintain/enhance relevant technology	<ul style="list-style-type: none"> <li>• Direct observation</li> <li>• Simulation/role playing</li> <li>• Case studies</li> </ul>	<ul style="list-style-type: none"> <li>• Written test</li> <li>• Practical/ performance test</li> </ul>

### COMMON COMPETENCIES

Unit of Competency	Learning Outcomes	Methodology	Assessment Approach
1. Perform mensuration and calculation	1.1 Select measuring instruments 1.2 Carry out measurements and calculation 1.3 Maintain measuring instruments	<ul style="list-style-type: none"> <li>• Lecture/ Demonstration</li> <li>• Practical exercises</li> <li>• Simulation</li> </ul>	<ul style="list-style-type: none"> <li>• Written test</li> <li>• Oral questioning</li> <li>• Direct observation</li> </ul>
2. Read, interpret and apply engineering manuals / specifications	2.1 Identify/access engineering manuals / specification 2.2 Interpret manual 2.3 Apply information in manual 2.4 Store manuals	<ul style="list-style-type: none"> <li>• Lecture/ Demonstration</li> <li>• Dual training</li> </ul>	<ul style="list-style-type: none"> <li>• Direct observation</li> <li>• Interview</li> </ul>
3. Move and position vehicle	3.1 Prepare vehicle for driving 3.2 Move and position vehicle 3.3 Check the vehicle	<ul style="list-style-type: none"> <li>• Lecture/ Demonstration</li> <li>• Practical exercises</li> <li>• Simulation</li> </ul>	<ul style="list-style-type: none"> <li>• Written test</li> <li>• Oral questioning</li> <li>• Direct observation</li> </ul>

<b>Unit of Competency</b>	<b>Learning Outcomes</b>	<b>Methodology</b>	<b>Assessment Approach</b>
4. Apply appropriate sealant / adhesive	4.1 Identify appropriate sealant/ adhesive 4.2 Prepare surface for sealant / adhesive application 4.3 Store unused and dispose used sealant/adhesive	<ul style="list-style-type: none"> <li>• Lecture/ Demonstration</li> <li>• Dual training</li> <li>• Distance learning</li> </ul>	<ul style="list-style-type: none"> <li>• Written test</li> <li>• Oral questioning</li> <li>• Direct observation</li> <li>• Interview</li> <li>• Project method</li> </ul>
5. Perform shop maintenance	5.1 Inspect/clean tools and work area 5.2 Store/arrange tools and shop equipment 5.3 Dispose waste/used lubricants 5.4 Report damaged tools/equipment	<ul style="list-style-type: none"> <li>• Lecture/ Demonstration</li> <li>• Dual training</li> <li>• Self-paced (modular)</li> </ul>	<ul style="list-style-type: none"> <li>• Written test</li> <li>• Direct observation</li> <li>• Interview</li> <li>• Practical exercises</li> </ul>

**CORE COMPETENCIES  
(200 Hours)**

<b>Unit of Competency</b>	<b>Learning Outcomes</b>	<b>Methodology</b>	<b>Assessment Approach</b>
1. Rectify faults on Installed electrical parts to engine assembly	1.1 Plan and prepare work 1.2 Diagnose and rectify electrical faults 1.3 Clean up work area	<ul style="list-style-type: none"> <li>• Lecture/ Demonstration</li> <li>• Dualized training</li> </ul>	<ul style="list-style-type: none"> <li>• Observation with questioning</li> <li>• Demonstration with questioning</li> <li>• Written test</li> <li>• Portfolio</li> </ul>
2. Rectify faults on installed electrical parts and electronic units to body Interior compartment	2.1 Plan and prepare work 2.2 Diagnose and rectify electrical faults 2.3 Clean up work area	<ul style="list-style-type: none"> <li>• Lecture/ Demonstration</li> <li>• Dualized training</li> </ul>	<ul style="list-style-type: none"> <li>• Observation with questioning</li> <li>• Demonstration with questioning</li> <li>• Written test</li> <li>• Portfolio</li> </ul>
3. Rectify faults on installed electrical parts and electronic units to dash instrument panel	3.1 Plan and prepare work 3.2 Diagnose and rectify electrical faults 3.3 Clean up work area	<ul style="list-style-type: none"> <li>• Lecture/ Demonstration</li> <li>• Dualized training</li> </ul>	<ul style="list-style-type: none"> <li>• Observation with questioning</li> <li>• Demonstration with questioning</li> <li>• Written test</li> <li>• Portfolio</li> </ul>
4. Rectify faults on	4.1 Plan and prepare work	<ul style="list-style-type: none"> <li>• Lecture/</li> </ul>	<ul style="list-style-type: none"> <li>• Observation</li> </ul>

<p>installed electrical parts to exterior and engine compartment</p>	<p>4.2 Diagnose and rectify electrical faults 4.3 Clean up work area</p>	<p>Demonstration</p> <ul style="list-style-type: none"> <li>• Dualized training</li> </ul>	<p>with questioning</p> <ul style="list-style-type: none"> <li>• Demonstration with questioning</li> <li>• Written test</li> <li>• Portfolio</li> </ul>
<p>5. Rectify faults on installed audio and video system to automotive vehicle</p>	<p>5.1 Plan and prepare work 5.2 Diagnose and rectify electrical fault 5.3 Clean up work area</p>	<ul style="list-style-type: none"> <li>• Lecture/ Demonstration</li> <li>• Dualized training</li> </ul>	<ul style="list-style-type: none"> <li>• Observation with questioning</li> <li>• Demonstration with questioning</li> <li>• Written test</li> <li>• Portfolio</li> </ul>

## 3.2 TRAINING DELIVERY

The delivery of training should adhere to the design of the curriculum. Delivery should be guided by the 10 basic principles of competency-based TVET.

- The training is based on curriculum developed from the competency standards;
- Learning is modular in its structure;
- Training delivery is individualized and self-paced;
- Training is based on work that must be performed;
- Training materials are directly related to the competency standards and the curriculum modules;
- Assessment is based in the collection of evidence of the performance of work to the industry required standard;
- Training is based both on and off-the-job components;
- Allows for recognition of prior learning (RPL) or current competencies;
- Training allows for multiple entry and exit; and
- Approved training programs are nationally accredited.

The competency-based TVET system recognizes various types of delivery modes, both on and off-the-job as long as the learning is driven by the competency standards specified by the industry. The following training modalities may be adopted when designing training programs:

- The dualized mode of training delivery is preferred and recommended. Thus programs would contain both in-school and in-industry training or fieldwork components. Details can be referred to the Dual Training System (DTS) Implementing Rules and Regulations.
- Modular/self-paced learning is a competency-based training modality wherein the trainee is allowed to progress at his own pace. The trainer facilitates the training delivery
- Peer teaching/mentoring is a training modality wherein fast learners are given the opportunity to assist the slow learners.
- Supervised industry training or on-the-job training is an approach in training designed to enhance the knowledge and skills of the trainee through actual experience in the workplace to acquire specific competencies prescribed in the training regulations.
- Distance learning is a formal education process in which majority of the instruction occurs when the students and instructor are not in the same place. Distance learning may employ correspondence study, or audio, video or computer technologies.

### 3.3 TRAINEE ENTRY REQUIREMENTS

Trainees or students should possess the following requirements:

- can communicate both oral and written;
- physically and mentally fit;
- with experience in basic machining; and
- must have undergone training in automotive electrical assembly NC II

This list does not include specific institutional requirements such as educational attainment, appropriate work experience, and others that may be required of the trainees by the school or training center delivering the TVET program.

### 3.4 TOOLS, EQUIPMENT AND MATERIALS AUTOMOTIVE SERVICING – NC III

Recommended list of tools, equipment and materials for the training of 20 trainees for AUTOMOTIVE ELECTRICAL ASSEMBLY NC III

TOOLS		EQUIPMENT		MATERIALS	
Qty.	Description	Qty.	Description	Qty.	Description
5 sets	Hand Tools - Sockets (assorted) - Screw bits - Pliers - Screw drivers (+ / -) - Hammers - Extension sockets - Universal sockets	2 sets 1 set	Lifting Equipment • Hoist (1 to 3 Tons) • Hangers and gears	50 li. 10 li 5 tubes 50 li 50 li	- Engine oil - Grease - Sealant /adhesive - Hydraulic oils/gear Oil - Automatic transmission fluid
2 pcs	Impact wrench $\frac{3}{4}$ drive	1 unit	Forklift (2 to 3 Tons)	1set	Parts for suspension assembly
2 pcs	Impact wrench $\frac{1}{2}$ drive	2 units	Hand Pallet Truck	1 set	Parts for power drive assembly
2 pcs	Torque wrench - click type	1 set	Mechanized or manual conveyors (optional)	1 set	Parts for fuel tank assembly
2 pcs	Torque wrench – dial type	1 unit	Tow motor	1 set	Parts for brake, clutch and pedal assembly
2 sets	Special tools (assorted)	1 set	Robotic windshield sealer application (optional)	1 set	Trim parts and components
2 pcs	Rubber Mallet	1 set	Wheel Alignment machine	1 set	Parts for radiator cooling assembly

2 pcs	Paint brush 1 in.	1 set	Oil dispenser	1 set	Parts for Air conditioning system
		1 set	Grease gun	1 set	Parts for bumpers
		1 set	Manual air and hydraulic pressurized lubrication	1 set	Parts for wheel assembly
		1 lot	Assorted Jigs/fixtures	1 set	Parts for windshield and door glasses assembly
		1 set	Sealer gun – pneumatic	1 set	Parts for power drive system
		1 set	Jigs/fixtures	1 set	Lubricants
				1 set	Sealants
				1 set	Adhesives/tapes
				20 pairs	Gloves
				5 pcs.	Goggles
				20pairs	Safety shoes
				5 pcs.	Apron
				20pairs	Ear Plug
				5 pcs	Hard hat
				1 unit	Automotive vehicle body
				1 set	Training materials
				pairs	Office supplies
				1 lot	Hardware parts

### 3.5 TRAINING FACILITIES AUTOMOTIVE ELECTRICAL ASSEMBLY NC III

The automotive workshop must be made of reinforced concrete or steel structure. The size must be suited on the requirements of the competencies. The class size of 25 students/trainees is reserved for the lecture room and the practical demonstration area for carrying out mechanical assembly of automotive vehicle body. Most of the learning activities such as on-vehicle mechanical assembly are performed in the workshop.

SPACE REQUIREMENT	SIZE IN METERS	AREA IN SQ. METERS	TOTAL AREA IN SQ. METERS
• Building (permanent)	12.00 x 32.00	-	384.00
• Student/Trainee Working Space	2.50 x 2.50 per student/trainee	6.25 per student	156.25
• Contextual Learning Laboratory	4.00 x 5.00	20.00	20.00
• Lecture Room	4.00 x 7.00	28.00	28.00
• Learning Resource Center	4.00 x 5.00	20.00	20.00
• Facilities/Equipment/Circulation Area**	-	-	<b>182.00</b>

**\*\* Area requirement is equivalent to 30% of the total teaching/learning areas**

### **3.6 TRAINERS' QUALIFICATION**

#### **AUTOMOTIVE/LAND TRANSPORT SECTOR**

##### **AUTOMOTIVE ELECTRICAL ASSEMBLY NC III**

##### **TRAINER QUALIFICATION (TQ II)**

- Must be a holder of AUTOMOTIVE ELECTRICAL ASSEMBLY NC II or equivalent qualification
- Must have undergone training on Training Methodology II (TM II) <sup>1</sup>
- Must be computer literate
- Must be physically and mentally fit
- Must have at least 2 years job/industry experience<sup>2</sup>
- Must be a civil-service eligible or holder of appropriate professional license issued by the Professional Regulatory Commission (for government positions only)

<sup>1</sup> This shall be changed to “:Must be a holder of Trainer Qualification Level II (TQII) or equivalent” upon promulgation by the TESDA Board of the TQ/AQ training regulations

<sup>2</sup> Optional. Only when required by the hiring institution

Reference: TESDA Board Resolution No. 2004 03

### **3.7 INSTITUTIONAL ASSESSMENT**

Institutional assessment is undertaken by trainees to determine their achievement of units of competency. A certificate of achievement is issued for each unit of competency.

## SECTION 4 NATIONAL ASSESSMENT AND CERTIFICATION ARRANGEMENTS

- 4.1 To attain the National Qualification of AUTOMOTIVE ELECTRICAL ASSEMBLY NC III, the candidate must demonstrate competence through assessment covering all the units of competency listed in Section 1. Successful candidates shall be awarded a National Certificate signed by the TESDA Director General.
- 4.2 Individual aspiring to be awarded the qualification of AUTOMOTIVE ELECTRICAL ASSEMBLY NC III must acquire Certificates of Competency in all the following core units of the Qualification. Candidates may apply for assessment in any accredited assessment center.
  - 4.2.1 Rectify Faults on Installed Electrical Parts to Engine Assembly
  - 4.2.2 Rectify Faults on Installed Electrical Parts and Electronic Units to Body Interior Compartment
  - 4.2.3 Rectify Faults on Installed Electrical Parts and Electronic Units to Dash Instrument Panel
  - 4.2.4 Rectify Faults on Installed Electrical Parts to Exterior and Engine Compartment
  - 4.2.5 Rectify Faults on Installed Audio and Video System to Automotive Vehicle
- 4.3 Accumulation and submission of all COCs acquired for the relevant units of competency comprising a qualification, an individual shall be issued the corresponding National Certificate.
- 4.4 Assessment shall focus on the core units of competency. The basic and common units shall be integrated or assessed concurrently with the core units.
- 4.5 The following are qualified to apply for assessment and certification:
  - 4.5.1 Holder of Foundry Molding NC II or equivalent qualification; or
  - 4.5.2 Graduates of formal, non-formal and informal including enterprise-based training programs.
  - 4.5.3 Experienced workers (wage employed or self employed)
- 4.6 The guidelines on assessment and certification are discussed in detail in the *“Procedures Manual on Assessment and Certification”* and *“Guidelines on the Implementation of the Philippine TVET Qualification and Certification System (PTQCS)”*.

## COMPETENCY MAP- AUTOMOTIVE SECTOR MANUFACTURING SUB SECTOR (PARTS ASSEMBLY)

<b>CORE COMPETENCIES</b>	Install/Fit out Electrical Parts to Engine Assembly	Install/Fit out Electronic Units to Body Interior Components	Install/Fit out Electrical Parts & Electronic Units to Dash Board Instrument Panel	Install/Fit out Electrical Parts to Exterior and Engine Compartment	Install/Fit out Audio and Video Systems	Perform Headlight Focus Aiming Operation	
	Rectify Faults on Installed electrical Parts to Engine Assembly	Rectify Faults on Installed Electrical Parts and Electronic Units to Body Interior	Rectify Faults on Installed Electrical Parts and Electronic Units to Dash Instrument Panel	Rectify Faults on Installed Electrical Parts to Exterior and Engine Compartment	Rectify Faults on Installed Audio and Video System		
	Assemble Mechanical Assemblies Using Jigs/ Fixtures	Mount/ Install Brake Fuel System	Mount/ Install Suspension Drive System	Mount/ Install Power Drive System	Install/Fit Trim Parts/Components	Perform Final Engine Run	Perform Wheel Alignment Operation
	Perform Engine Hot Test	Rectify Assembly Faults on Assembled Mechanical Assemblies	Rectify Faults on Mounted/Installed Brake and Fuel System	Rectify Faults on Mounted/Installed Power Drive System	Rectify Faults on Mounted/Installed Suspension Drive Train		

<b>COMMON COMPETENCIES</b>	Perform Mensuration and Calculation	Read, Interpret and Apply Engineering Manual and Specifications	Move and Position Vehicle	Apply Appropriate Sealant/Adhesives	Perform Shop Maintenance

<b>BASIC COMPETENCIES</b>	Receive and respond workplace communication	Work with Other	Demonstrate work values	Practice basic housekeeping procedures	Lead in workplace communication	Develop and practice negotiation skills	Use relevant technologies	Solve workplace problems related to work activities
	Participate in workplace communication	Work in team environment	Practice career professionalism	Practice occupational health and safety procedures	Lead small Team	Use mathematical concepts and techniques	Develop team and individual	Apply problem solving techniques in the workplace
	Plan and organize work	Utilize specialist communication skills						

Legend:

AUTOMOTIVE ELECTRICAL ASSEMBLIES NC III

## DEFINITION OF TERMS

1. **Automotive Vehicles** These are motor vehicles whose gross vehicle weight is equal or less than 3,500 kgs. Powered by a gas or diesel engine. It could be a passenger car or a light utility vehicle
2. **Automotive Electrical Assembly Technician** Refers to an all around auto electrical assembly man that can perform all electrical assembly works from assembling of electrical assemblies to mounting and installation to automotive vehicle body.
3. **Adhesives** Substance used to hold gasket in place during assembly. It also maintains a tight seal by filling in small irregularities on a surface and prevents gasket from shifting due to vibration.
4. **Point of Fit** Refers to the assembly area where parts / materials / assemblies are used or consumed
5. **Electronics** Electrical assemblies, circuit and system that use electronic devices such as transistors and diodes
6. **Hardware Parts** Refers to bolts, nuts, screws, washers and other small parts
7. **Catalytic Converter** Emission The control device fitted in the exhaust system of an internal combustion engine. The converter reduces the toxicity of products of combustion by catalytic re-combination
8. **Assembly Manuals** Reference manuals with illustration or drawings of parts/components and its direction on how they are mounted or installed on the automotive vehicle or certain assemblies.
9. **Quality Inspection Manuals** Reference manuals with explanation on what quality standards have to be maintained in the conduct of assembling automotive vehicle
10. **Work Order** A work order is a form of instruction that is broadcasted either by manual or by electronic system by preceding stations to the next stations regarding on what model sequence to produce on a timely-structured manner.
11. **Job Requirements** Refers to specific specifications of model/variant to be assembled.
12. **Standard Operation Sheet** Is a listing of process elements arrange according to the assembly sequence for a given job requirements
13. **Fuel Injection** An electronic system that increases the performance ad fuel economy because it monitors engine conditions and provides the correct air/fuel mixture based on the engine's demand. It injects fuel directly into the cylinder head enabling more precise control over the quantity used.
15. **Jigs/fixtures** Kind of equipment that is used for sub-assembly operations in order to meet the desired dimensions and outcome of a certain assembly.

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