TRAINING REGULATIONS

AUTOMOTIVE ELECTRICAL ASSEMBLY NC II

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

TABLE OF CONTENTS
AUTOMOTIVE MANUFACTURING SUB-SECTOR

AUTOMOTIVE ELECTRICAL ASSEMBLY NC II

TRAINING REGULATIONS FOR

AUTOMOTIVE ELECTRICAL ASSEMBLY NC II

SECTION 1 AUTOMOTIVE ELECTRICAL ASSEMBLY NC II QUALIFICATION

The AUTOMOTIVE ELECTRICAL ASSEMBLY NC II Qualification consists of competencies that a person must achieve to mount/install electrical parts and electronic units to automotive vehicle body in accordance with manufacturer's specification. It also covers headlight focus aiming operations.

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

The Units of Competency comprising this Qualification include the following

CODE NO.	BASIC COMPETENCIES
500311105	Participate in Workplace Communication
500311106	Work in Team Environment
500311107	Practice Career Professionalism
500311108	Practice Occupational Health and Safety Procedures

CODE NO.	COMMON COMPETENCIES
ALT311202	Perform Mensuration and Calculation
ALT742201	Read, Interpret and Apply engineering Drawings
ALT723202	Move and Position Vehicle
ALT723201	Apply Appropriate Sealant/Adhesive
ALT723205	Perform Shop Maintenance

CODE NO.	CORE COMPETENCIES
ALT827301	Install/Fit Out Electrical Parts to Engine Assembly
ALT827302	Install/fit Out Electrical Parts and Electronic Units to Body Interior Compartment
ALT827303	Install/Fit Out Electrical Parts and Electronic Units to Dash Instrument Panel
ALT827304	Install/Fit Out Electrical Parts to Exterior and Engine Compartment
ALT827305	Install/Fit Out Audio and Video Systems
ALT827306	Perform Headlight Focus Aiming Operations

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

- **Automotive Electrical Assembly Technician**

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 ASSEMBLIES NC II.

BASIC COMPETENCIES

UNIT OF COMPETENCY : **PARTICIPATE IN WORKPLACE COMMUNICATION**

UNIT CODE : **500311105**

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to gather, interpret and convey information in response to workplace requirements.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Obtain and convey workplace information	1.1 Specific and relevant information is accessed from ***appropriate sources*** 1.2 Effective questioning , active listening and speaking skills are used to gather and convey information 1.3 Appropriate ***medium*** is used to transfer information and ideas 1.4 Appropriate non- verbal communication is used 1.5 Appropriate lines of communication with supervisors and colleagues are identified and followed 1.6 Defined workplace procedures for the location and ***storage*** of information are used 1.7 Personal interaction is carried out clearly and concisely
2. Participate in workplace meetings and discussions	2.1 Team meetings are attended on time 2.2 Own opinions are clearly expressed and those of others are listened to without interruption 2.3 Meeting inputs are consistent with the meeting purpose and established ***protocols*** 2.4 ***Workplace interactions*** are conducted in a courteous manner 2.5 Questions about simple routine workplace procedures and maters concerning working conditions of employment are asked and responded to 2.6 Meetings outcomes are interpreted and implemented
3. Complete relevant work related documents	3.1 Range of ***forms*** relating to conditions of employment are completed accurately and legibly 3.2 Workplace data is recorded on standard workplace forms and documents 3.3 Basic mathematical processes are used for routine calculations 3.4 Errors in recording information on forms/ documents are identified and properly acted upon 3.5 Reporting requirements to supervisor are completed according to organizational guidelines

RANGE OF VARIABLES

VARIABLE	RANGE
1. Appropriate sources	1.1. Team members 1.2. Suppliers 1.3. Trade personnel 1.4. Local government 1.5. Industry bodies
2. Medium	2.1. Memorandum 2.2. Circular 2.3. Notice 2.4. Information discussion 2.5. Follow-up or verbal instructions 2.6. Face to face communication
3. Storage	3.1. Manual filing system 3.2. Computer-based filing system
4. Forms	4.1. Personnel forms, telephone message forms, safety reports
5. Workplace interactions	5.1. Face to face 5.2. Telephone 5.3. Electronic and two way radio 5.4. Written including electronic, memos, instruction and forms, non-verbal including gestures, signals, signs and diagrams
6. Protocols	6.1. Observing meeting 6.2. Compliance with meeting decisions 6.3. Obeying meeting instructions

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1. Prepared written communication following standard format of the organization 1.2. Accessed information using communication equipment 1.3. Made use of relevant terms as an aid to transfer information effectively 1.4. Conveyed information effectively adopting the formal or informal communication
2. Underpinning knowledge and attitudes	2.1. Effective communication 2.2. Different modes of communication 2.3. Written communication 2.4. Organizational policies 2.5. Communication procedures and systems 2.6. Technology relevant to the enterprise and the individual's work responsibilities
3. Underpinning skills	3.1. Follow simple spoken language 3.2. Perform routine workplace duties following simple written notices 3.3. Participate in workplace meetings and discussions 3.4. Complete work related documents 3.5. Estimate, calculate and record routine workplace measures 3.6. Basic mathematical processes of addition, subtraction, division and multiplication 3.7. Ability to relate to people of social range in the workplace 3.8. Gather and provide information in response to workplace Requirements
4. Resource implications	4.1. Fax machine 4.2. Telephone 4.3. Writing materials 4.4. Internet
5. Methods of assessment	5.1. Direct Observation 5.2. Oral interview and written test
6. Context for assessment	6.1. Competency may be assessed individually in the actual workplace or through accredited institution

UNIT OF COMPETENCY : WORK IN TEAM ENVIRONMENT

UNIT CODE : 500311106

UNIT DESCRIPTOR : This unit covers the skills, knowledge and attitudes to identify role and responsibility as a member of a team.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Describe team role and scope	1.1. The ***role and objective of the team*** is identified from available ***sources of information***
	1.2. Team parameters, reporting relationships and responsibilities are identified from team discussions and appropriate external sources
2. Identify own role and responsibility within team	2.1. Individual role and responsibilities within the team environment are identified
	2.2. Roles and responsibility of other team members are identified and recognized
	2.3. Reporting relationships within team and external to team are identified
3. Work as a team member	3.1. Effective and appropriate forms of communications used and interactions undertaken with team members who contribute to known team activities and objectives
	3.2. Effective and appropriate contributions made to complement team activities and objectives, based on individual skills and competencies and ***workplace context***
	3.3. Observed protocols in reporting using standard operating procedures
	3.4. Contribute to the development of team work plans based on an understanding of team's role and objectives and individual competencies of the members.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Role and objective of team	1.1. Work activities in a team environment with enterprise or specific sector 1.2. Limited discretion, initiative and judgment maybe demonstrated on the job, either individually or in a team environment
2. Sources of information	2.1. Standard operating and/or other workplace procedures 2.2. Job procedures 2.3. Machine/equipment manufacturer's specifications and instructions 2.4. Organizational or external personnel 2.5. Manufacturer/supplier instructions 2.6. Quality standards 2.7. OHS and environmental standards
3. Workplace context	3.1. Work procedures and practices 3.2. Conditions of work environments 3.3. Legislation and industrial agreements 3.4. Standard work practice including the storage, safe handling and disposal of chemicals 3.5. Safety, environmental, housekeeping and quality guidelines

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1. Operated in a team to complete workplace activity 1.2. Worked effectively with others 1.3. Conveyed information in written or oral form 1.4. Selected and used appropriate workplace language 1.5. Followed designated work plan for the job 1.6. Reported outcomes
2. Underpinning knowledge and attitude	2.1. Communication process 2.2. Team structure 2.3. Team roles 2.4. Group planning and decision making
3. Underpinning skills	3.1. Communicate appropriately, consistent with the culture of the workplace
4. Resource implications	The following resources **MUST** be provided: 4.1. Access to relevant workplace or appropriately simulated environment where assessment can take place 4.2. Materials relevant to the proposed activity or tasks
5. Methods of assessment	Competency may be assessed through: 5.1. Observation of the individual member in relation to the work activities of the group 5.2. Observation of simulation and or role play involving the participation of individual member to the attainment of organizational goal 5.3. Case studies and scenarios as a basis for discussion of issues and strategies in teamwork
6. Context for assessment	6.1. Competency may be assessed in workplace or in a simulated workplace setting 6.2. Assessment shall be observed while task are being undertaken whether individually or in group

UNIT OF COMPETENCY : PRACTICE CAREER PROFESSIONALISM

UNIT CODE : 500311107

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes in promoting career growth and advancement.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Integrate personal objectives with organizational goals	1.1 Personal growth and work plans are pursued towards improving the qualifications set for the profession 1.2 Intra- and interpersonal relationships ~~is~~ are maintained in the course of managing oneself based on performance ***evaluation*** 1.3 Commitment to the organization and its goal is demonstrated in the performance of duties
3 Set and meet work priorities	2.1 Competing demands are prioritized to achieve personal, team and organizational goals and objectives. 2.2 ***Resources*** are utilized efficiently and effectively to manage work priorities and commitments 2.3 Practices along economic use and maintenance of equipment and facilities are followed as per established procedures
3 Maintain professional growth and development	3.1 ***Trainings and career opportunities*** are identified and availed of based on job requirements 3.2 ***Recognitions*** are sought/received and demonstrated as proof of career advancement 3.3 ***Licenses and/or certifications*** relevant to job and career are obtained and renewed

RANGE OF VARIABLES

VARIABLE	RANGE
1. Evaluation	1.1 Performance Appraisal 1.2 Psychological Profile 1.3 Aptitude Tests
2. Resources	2.1 Human 2.2 Financial 2.3 Technology 2.3.1 Hardware 2.3.2 Software
3. Trainings and career opportunities	3.1 Participation in training programs 3.1.1 Technical 3.1.2 Supervisory 3.1.3 Managerial 3.1.4 Continuing Education 3.2 Serving as Resource Persons in conferences and workshops
4. Recognitions	4.1 Recommendations 4.2 Citations 4.3 Certificate of Appreciations 4.4 Commendations 4.5 Awards 4.6 Tangible and Intangible Rewards
5. Licenses and/or certifications	5.1 National Certificates 5.2 Certificate of Competency 5.3 Support Level Licenses 5.4 Professional Licenses

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Attained job targets within key result areas (KRAs) 1.2 Maintained intra - and interpersonal relationship in the course of managing oneself based on performance evaluation 1.3 Completed trainings and career opportunities which are based on the requirements of the industries 1.4 Acquired and maintained licenses and/or certifications according to the requirement of the qualification
2. Underpinning knowledge and attitudes	2.1 Work values and ethics (Code of Conduct, Code of Ethics, etc.) 2.2 Company policies 2.3 Company-operations, procedures and standards 2.4 Fundamental rights at work including gender sensitivity 2.5 Personal hygiene practices
3. Underpinning skills	3.1 Appropriate practice of personal hygiene 3.2 Intra and Interpersonal skills 3.3 Communication skills
4. Resource implications	The following resources **MUST** be provided: 4.1 Workplace or assessment location 4.2 Case studies/scenarios
5. Method of assessment	Competency may be assessed through: 5.1 Portfolio Assessment 5.2 Interview 5.3 Simulation/Role-plays 5.4 Observation 5.5 Third Party Reports 5.6 Exams and Tests
6. Context for assessment	6.1 Competency may be assessed in the work place or in a simulated work place setting

UNIT OF COMPETENCY : **PRACTICE OCCUPATIONAL HEALTH AND SAFETY PROCEDURES**

UNIT CODE : **500311108**

UNIT DESCRIPTOR : This unit covers the outcomes required to comply with regulatory and organizational requirements for occupational health and safety.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Identify hazards and risks	1.1 ***Safety regulations*** and workplace safety and hazard control practices and procedures are clarified and explained based on organization procedures 1.2 ***Hazards/risks*** in the workplace and their corresponding indicators are identified to minimize or eliminate risk to co-workers, workplace and environment in accordance with organization procedures 1.3 ***Contingency measures*** during workplace accidents, fire and other emergencies are recognized and established in accordance with organization procedures
2. Evaluate hazards and risks	2.1 Terms of maximum tolerable limits which when exceeded will result in harm or damage are identified based on threshold limit values (TLV) 2.2 Effects of the hazards are determined 2.3 OHS issues and/or concerns and identified safety hazards are reported to designated personnel in accordance with workplace requirements and relevant workplace OHS legislation

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
3. Control hazards and risks	3.1 Occupational Health and Safety (OHS) procedures for controlling hazards/risks in workplace are consistently followed 3.2 Procedures for dealing with workplace accidents, fire and emergencies are followed in accordance with organization OHS policies 3.3 ***Personal protective equipment (PPE)*** is correctly used in accordance with organization OHS procedures and practices 3.4 Appropriate assistance is provided in the event of a workplace emergency in accordance with established organization protocol
4. Maintain OHS awareness	4.1 ***Emergency-related drills and trainings*** are participated in as per established organization guidelines and procedures 4.2 ***OHS personal records*** are completed and updated in accordance with workplace requirements

RANGE OF VARIABLES

VARIABLE	RANGE
1. Safety regulations	May include but are not limited to: 1.1 Clean Air Act 1.2 Building code 1.3 National Electrical and Fire Safety Codes 1.4 Waste management statutes and rules 1.5 Philippine Occupational Safety and Health Standards 1.6 DOLE regulations on safety legal requirements 1.7 ECC regulations
2. Hazards/Risks	May include but are not limited to: 2.1 Physical hazards – impact, illumination, pressure, noise, vibration, temperature, radiation 2.2 Biological hazards- bacteria, viruses, plants, parasites, mites, molds, fungi, insects 2.3 Chemical hazards – dusts, fibers, mists, fumes, smoke, gasses, vapors 2.4 Ergonomics • Psychological factors – over exertion/ excessive force, awkward/static positions, fatigue, direct pressure, varying metabolic cycles • Physiological factors – monotony, personal relationship, work out cycle
3. Contingency measures	May include but are not limited to: 3.1 Evacuation 3.2 Isolation 3.3 Decontamination 3.4 (Calling designed) emergency personnel
4. PPE	May include but are not limited to: 4.1 Mask 4.2 Gloves 4.3 Goggles 4.4 Hair Net/cap/bonnet 4.5 Face mask/shield 4.6 Ear muffs 4.7 Apron/Gown/coverall/jump suit 4.8 Anti-static suits 4.9 Hard hat

VARIABLE	RANGE
5. Emergency-related drills and training	5.1 Fire drill 5.2 Earthquake drill 5.3 Basic life support/CPR 5.4 First aid 5.5 Spillage control 5.6 Decontamination of chemical and toxic 5.7 Disaster preparedness/management
6. OHS personal records	6.1 Medical/Health records 6.2 Incident reports 6.3 Accident reports 6.4 OHS-related training completed

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Explained clearly established workplace safety and hazard control practices and procedures 1.2 Identified hazards/risks in the workplace and its corresponding indicators in accordance with company procedures 1.3 Recognized contingency measures during workplace accidents, fire and other emergencies 1.4 Identified terms of maximum tolerable limits based on threshold limit value- TLV. 1.5 Followed Occupational Health and Safety (OHS) procedures for controlling hazards/risks in workplace 1.6 Used Personal Protective Equipment (PPE) in accordance with company OHS procedures and practices 1.7 Completed and updated OHS personal records in accordance with workplace requirements
2. Underpinning knowledge and attitude	2.1 OHS procedures and practices and regulations 2.2 PPE types and uses 2.3 Personal hygiene practices 2.4 Hazards/risks identification and control 2.5 Threshold Limit Value -TLV 2.6 OHS indicators 2.7 Organization safety and health protocol 2.8 Safety consciousness 2.9 Health consciousness
3. Underpinning skills	3.1 Practice of personal hygiene 3.2 Hazards/risks identification and control skills 3.3 Interpersonal skills 3.4 Communication skills
4 Resource implications	The following resources must be provided: 4.1 Workplace or assessment location 4.2 OHS personal records 4.3 PPE 4.4 Health records
5 Method of assessment	Competency must be assessed through: 5.1 Portfolio Assessment 5.2 Interview 5.3 Case Study/Situation
6 Context for assessment	6.1 Competency may be assessed in the work place or in a simulated work place setting

COMMON COMPETENCIES

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

UNIT CODE : **ALT311202**

UNIT DESCRIPTOR : This unit includes identifying caring, handling and use of measuring instruments.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms 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 ***measuring instrument*** 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 ***Calculation*** needed to complete work tasks are performed using the four basic process 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	3.1 Measuring instruments must kept free from corrosion 3.2 Measuring instruments not dropped to avoid damage 3.3 Measuring instruments cleaned before and after using.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Measuring instruments	Measuring instruments includes: 1.1 Multi-tester 1.2 Vernier caliper (Out,inside) 1.3 Push-pull gage. 1.4 Thickness gauge 1.5 Steel ruler 1.6 Torque Gauge
2. Calculation	Kinds of Part Mensuration include: 2.1 Area 2.2 Inside diameter 2.3 Circumference 2.5 Length 2.6 Thickness 2.7 Outside diameter 2.8 Taper 2.9 Out of roundness 2. 10 Oil clearance 2.11 Oil 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 and attitudes	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 3.1 Performing calculation by Addition, Subtraction, Multiplication and Division 3.2 Visualizing objects and shapes 3.3 Interpreting formula for volume, area, perimeter and other geometric figures
3 Resource implications	The following resources must 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 must be assessed through: 5.1 Observation with questioning 5.2 Written or oral examination 5.3 Interview 5.4 Demonstration with questioning
6. Context for 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

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 and attitudes	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 2.3 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 3.4 Performing calculation by Addition, Subtraction, Multiplication and Division 3.5 Visualizing objects and shapes 3.6 Interpreting formula for volume, area, perimeter and other geometric figures
4. Resource implications	The following resources must 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 must be assessed through: 5.1 Observation with questioning 5.2 Written or oral examination 5.3 Interview 5.4 Demonstration with questioning
6. Context for 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.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Identify and access engineering manuals / specifications	1.1 Appropriate ***manuals*** 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 and attitudes	2.1 Types of manuals used in automotive industry 2.2 Identification of symbols used in the manuals 3.1 Identification of units of measurements 3.2 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 must 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 must be assessed through: 5.1 Observation with questioning 5.2 Interview
6. Context for 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 competency unit covers the knowledge, skills and attitude needed to move and position vehicle in a workshop.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Prepare vehicle for driving	1.1 Correct ***check-up procedures*** performed based on vehicle manufacturer standard
2. Move and position vehicle	2.1 Select vehicle to be moved or re-positioned. *2.2* Drive the vehicle to appropriate location *2.3* Park vehicle following ***parking safety techniques*** and procedure
3. Check vehicle	3.1 ***Vehicle*** 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	Assessment requires evidence that the candidate: 1.1 Prepared vehicle for driving. 1.2 Moved and positioned vehicle 1.3 Checked the vehicle.
2. Underpinning knowledge and attitudes	2.1 Driver's Code of conduct 2.2 Workshop signs and symbols 2.3 Driving skills 2.4 Vehicle accessories for safe driving and parking
3. Underpinning skills	3.1 Ability to handle vehicle/maneuver vehicle the easiest way 3.2 Immediate response to accident 3.3 Preparing vehicle for driving 3.4 Parking Downhill, Uphill, Parallel 3.5 Shifting Gears 3.6 Maneuvering
4. Resource implications	The following resources must be provided: 4.1 Driving range/area 4.2 Appropriate vehicle for driving 4.3 Vehicle accessories
5. Method of assessment	Competency must be assessed through: 5.1 Observation with questioning 5.2 Written or oral examination
6. Context for assessment	6.1 Assessment must be undertaken in accordance with the endorsed TESDA assessment guidelines 6.2 Assessment of practical skills must be done in a workplace or simulated environment.

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

UNIT CODE : **ALT723201**

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

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Identify appropriate Sealant/adhesive	1.1 ***Sealant/adhesive*** is selected in line with job requirements and manufacturer's specification 1.2 ***Sealant/adhesive checking*** 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 ***Tools and equipment*** used to apply sealant/adhesive are appropriate to job requirements 3.4 ***Safety*** are observed and PPE are worn in accordance with industry SOP 3.5 ***Hazards*** 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: 1.1Form in Place Gasket (FIPG) 1.2 Ribbon Sealer 1.3Hametite 1.4Silicon 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 3.11Goggles 3.12Gas 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	Assessment requires evidence that the candidate: 1.1 Identified appropriate sealant/adhesives 1.2 Prepared surface for sealant/adhesive 1.3 Applied sealant/adhesive 1.4 Stored unused or dispose of used sealant/adhesive
2. Underpinning knowledge and attitude	2.1 OH & S regulations 2.2 Safe handling of sealant/adhesive 2.3 Industry code of practice 2.4 Procedures in sealant/adhesive application 2.5 Procedures in interpreting manuals
3. Underpinning skills	3.1 Handling sealant/adhesive 3.2 Applying sealant/adhesive 3.3.Sanding the surface 3.4 Use of tools, equipment 3.5 Mixing of body filler and epoxy base and hardener
4. Resource implications	The following resources must be provided: 4.1 Materials relevant to the activity 4.2 Appropriate tools and equipment 4.3 Real or simulated workplace
5. Method of assessment	Competency must be assessed through 5.1 Observation with questioning 5.2 Interview related to: • Safe and correct use of tools and equipment • Application of adhesive/sealant
6. Context of assessment	6.1 Competency elements must be assessed in a safe working environment 6.2 Assessment may be done in a workplace or simulated environment

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

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Inspect/clean tools and work area	1.1 Cleaning solvent used as per workshop/tools ***cleaning requirement*** 1.2 ***Work area*** 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 electricians/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: • Mess hall • Wash room • Comfort room

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 must 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 must 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 : **INSTALL/FIT OUT ELECTRICAL PARTS TO ENGINE ASSEMBLY**

UNIT CODE : **ALT827301**

UNIT DESCRIPTOR : This unit identifies the competence required for the preparation, delivery and installation/fitting out of electrical parts to engine assembly in accordance with company standards.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Obtain materials / parts for job.	1.1 Materials/parts list is read and interpreted to establish ***requirements for the job***. 1.2 ***Parts/materials*** are picked by matching part numbers and stacked in the warehouse bin/container and floor stack areas. 1.3 Parts/materials are delivered to respective ***point of fit*** to ensure smooth and continuous production.
2. Select and use tools and equipment	2.1 ***Tools and equipment*** are selected to meet job requirements. 2.2 Tools and equipment are checked to ensure they are in good working order. 2.3 Appropriate lifting hangers/gears are selected and used in accordance with OH&S requirements.
3. Load and unload engine into assembly jigs	3.1 ***Engine*** is matched to the jigging equipment reference to part numbers and codes. 3.2 Engine is securely clamped to prevent movement and distortion during the assembly operation as specified in the standard operation sheet
4. Select and use hardware parts	4.1 ***Hardware parts*** are identified and selected to meet the job requirements as stated in the materials/parts list. 4.2 Hardware parts are fitted in the required number to the designated positions stated in the materials/parts list and associated ***engineering manuals***.
5. Mount/install electrical parts	5.1 Materials/parts list and engineering drawings are correctly read and interpreted. 5.2 Parts are matched with the materials/parts list for the particular requirements for the job. 5.3 Parts are positioned and secured into engine assembly as per the relevant drawings and ***standard operation sheet.*** 5.4 Specified nuts, bolts and screws are tensioned to the specified torque requirements stated in the engineering manuals and standard operating sheet 5.5 Identified faults are recorded, reported and rectified/scrapped in accordance with company procedures.
6. Route service lines	6.1 Materials/parts list and engineering manuals are correctly read and interpreted. 6.2 Appropriate hardware parts are selected and used according to specifications. 6.3 ***Service lines*** are routed, tied and clipped to specification. 6.4 Workflow and production output are recorded and maintained.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Requirements for the Job	1.1. Production schedule 1.2. Work Order Note: 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.
2. Parts and materials	Parts may include and but not limited to: 2.1. Starter assembly 2.2. Alternator Assembly 2.3. Engine wiring harness 2.4. Electronic fuel injection unit 2.5. Ignition system Materials may include but not limited to: Sealants, adhesive, tapes and consumables
3. Point of fit	This includes the different work stations in the assembly line like: 3.1. Main stream lines or on-line assembly stations 3.2. Off-line assembly stations
4. Tools and equipment	4.1. Hand tools 4.2. Torque wrenches 4.3. Power or pneumatic impact guns/wrenches 4.4. Mechanized or manual Conveyors 4.5. Tow motors 4.6. Forklifts 4.7. Hand pallet truck (manual and mechanized)
5. Engine	5.1. Gasoline engine 5.2. Diesel engine
6. Hardware parts	Hardware parts may include and but not limited to: 6.1. Nuts 6.2. Bolts 6.3. Screws 6.4. Fasteners 6.5. Washers

7. Engineering manuals	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. Standard operation sheet	Type of standard operation sheet may include: 8.1. Procedural 8.2. Elemental
9. Service lines	9.1. Engine Wiring harness 9.2. Cable speedometer

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1. Obtained parts and materials for the job. 1.2. Interpreted materials/parts list and engineering drawings with the requirements for the job. 1.3. Selected appropriate parts, materials and set of tools and equipment. 1.4. Mounted/Installed electrical parts into engine assembly in accordance with the specification. 1.5. Ensured specified nuts, bolts and screws are tensioned to the specified torque requirements. 1.6. Routed service lines in accordance with engineering drawings/manuals. 1.7. Employed safe working practices.
2. Underpinning knowledge and attitudes	2.1. Read and interpret engineering manuals 2.2. Components and their purpose within the assembly 2.3. Particular application or use of material handling equipment 2.4. Company policies and procedures 2.5. Company OH&S procedures 2.6. Maintenance and calibration of Torque wrench 2.7. Work values and ethics 2.8. Punctuality at workplace area
3. Underpinning skills	3.1. Parts/materials differentiation and classification 3.2. Proper use of pneumatic impact guns and torque wrenches 3.3. Participate in workplace meetings and discussions 3.4. Complete work related documents 3.5. Basic mathematical processes of addition, subtraction, division and multiplication 3.6. Gather and provide information in response to workplace requirements
4. Resource Implications	The following resources **MUST** be provided: 4.1. 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. Methods of Assessment	Competency **MUST** be assessed through: 5.1. Direct Observation with questioning 5.2. Oral interview and written test 5.3. Portfolio assessment
6. Context of assessment	6.1. Competency may be assessed individually in the actual workplace or a simulated workplace environment. 6.2. Practical skills must take place only after a period of supervised practice and repetitive experience. 6.3. Prescribe outcome must be able to achieve without direct supervision.

UNIT OF COMPETENCY : INSTALL / FIT OUT ELECTRICAL PARTS AND ELECTRONIC UNITS TO BODY INTERIOR COMPARTMENT

UNIT CODE : **ALT827302**

UNIT DESCRIPTOR : This unit identifies the competence required for the preparation, delivery and installation/fitting out of electrical parts and electronic units to body interior compartment in accordance with company standards.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Obtain materials / parts for job.	1.1 Materials/parts list is read and interpreted to establish ***requirements for the job*.** 1.2 Parts and electronic units are picked by matching part numbers and stacked in the warehouse bin/container and floor stack areas. 1.3 Parts/materials are delivered to respective ***point of fit*** to ensure smooth and continuous production.
2. Select and use tools and equipment	2.1 ***Tools and equipment*** are selected to meet job requirements. 2.2 Tools and equipment are checked to ensure they are in good working order.
3. Select and use hardware parts	3.1 ***Hardware parts*** are identified and selected to meet the job requirements as stated in the materials/parts list. 3.2 Hardware parts are fitted in the required number to the designated positions stated in the materials/parts list and ***engineering manuals***.
4. Mount/install parts and electronic units	4.1 Materials/parts list and engineering drawings are correctly read and interpreted. 4.2 ***Parts and electronic units*** are matched with the materials/parts list for the particular requirements of the job. 4.3 Parts and electronic units are positioned and secured into ***automotive vehicle body*** as per the relevant drawings/instructions. 4.4 Specified nuts, bolts and screws are tensioned to the specified torque requirements stated in the engineering manuals and ***standard operating sheet*** 4.5 Identified faults are recorded, reported and rectified/scrapped in accordance with company procedures.
5. Route service lines	5.1 Materials/parts list and engineering manuals are correctly read and interpreted. 5.2 Appropriate hardware parts are selected and used according to specifications. 5.3 ***Service lines*** are routed, tied and clipped to specification. 5.4 Workflow and production output are recorded and maintained.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Requirements for the Job	1.1. Production schedule 1.2. Work Order Note: 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.
2. Point of fit	This includes the different work stations in the assembly line like: 2.1. Main stream or on-line assembly stations 2.2. Off-line assembly stations
3. Tools and equipment	3.1. Hand tools 3.2. Torque wrenches 3.3. Power or pneumatic impact guns/wrenches 3.4. Mechanized or manual Conveyors 3.5. Tow motors 3.6. Forklifts 3.7. Hand pallet truck (manual and mechanized)
4. Hardware parts	Hardware parts may include but not limited to: 4.1. Nuts 4.2. Bolts 4.3. Screws 4.4. Fasteners 4.5. Washers
5. Engineering manuals	5.1. Vehicle assembly manuals per model-variant 5.2. Vehicle quality standard manuals per model-variant 5.3. Process control Chart/sheets 5.4. Vehicle Specification sheets 5.5. Materials/Parts list

6. Parts and electronic units	Parts are located in warehouse area and may include but not limited to: 6.1. Electrical wiring harness like: • Main wiring harness with fuse and relay boxes • Wiring harness- doors • Wiring harness- roof • Wiring harness- package tray • Defogger wire 6.2. Lamp assembly includes: • Luggage compartment /under the package tray • Roof and door lamps • Reading lamps 6.3. Electronic computer control system (ECCS) 6.4. Electrical relays and fuses Materials may include but not limited to: 6.5. Sealants, adhesive, tapes and consumables that are located in warehouse stores.
7. Automotive vehicle body	7.1. Passenger car 7.2. Utility vehicle
8. Standard operation sheet	Type of standard operation sheet may include: 8.1. Procedural 8.2. Elemental
9. Service lines	9.1. Electrical Wiring harness 9.2. Cable

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1. Obtained parts and materials for the job. 1.2. Interpreted materials/parts list and engineering drawings with the requirements for the job. 1.3. Selected appropriate parts, materials and set of tools and equipment. 1.4. Mounted/Installed electrical parts and electronic units into interior compartment to specification. 1.5. Ensured specified nuts, bolts and screws are tensioned to the specified torque requirements. 1.6. Routed service lines in accordance with engineering drawings/manuals. 1.1. Employed safe working practices.
2. Underpinning knowledge and attitudes	2.1. Read and interpret engineering drawings 2.2. Components and their purpose within the assembly 2.3. Particular application or use of material handling equipment 2.4. Company policies and procedures 2.5. Company OH&S procedures 2.6. Maintenance and calibration of Torque wrench 2.7. Work values and ethics 2.8. Punctuality at workplace area
3. Underpinning skills	3.1. Parts/components and materials differentiation and classification 3.2. Proper use of pneumatic impact guns and torque wrenches 3.3. Participate in workplace meetings and discussions 3.4. Basic mathematical processes of addition, subtraction, division and multiplication 3.5. Gather and provide information in response to workplace requirements
4. Resource implications	The following resources **MUS**T be provided: 4.1. 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 and drawings
5. Method of assessment	Competency **MUST** be assessed through: 5.1. Direct Observation with questioning 5.2. Oral interview and written test 5.3. Portfolio assessment
6. Context of assessment	6.1. Competency may be assessed individually in the actual workplace or a simulated workplace environment. 6.2. Practical skills must take place only after a period of supervised practice and repetitive experience. 6.3. Prescribe outcome must be able to achieve without direct supervision.

UNIT OF COMPETENCY: **INSTALL / FIT OUT ELECTRICAL PARTS AND ELECTRONIC UNITS TO DASH PANEL INSTRUMENT**

UNIT CODE : **ALT827303**

UNIT DESCRIPTOR : This unit identifies the competence required for the preparation, delivery and installation/fitting out of electrical parts and electronic units to dash panel instrument. It also includes the fitting out of electrical parts to steering wheel column in accordance with company standards.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Obtain materials / parts for job.	1.1 Materials/parts list is read and interpreted to establish ***requirements for the job.*** 1.2 Parts and electronic units are picked by matching part numbers that are stacked in warehouse bin/container and floor stack areas. 1.3 Parts and electronic unit and materials are delivered to respective ***point of fit*** to ensure smooth and continuous production.
2. Select and use tools and equipment	2.1 ***Tools and equipment*** are selected to meet job requirements. 2.2 Tools and equipment are checked to ensure they are in good working order.
3. Select and use hardware parts	3.1 ***Hardware parts*** are identified and selected to meet the job requirements as stated in the materials/parts list. 3.2 Hardware parts are fitted in the required number to the designated positions stated in the materials/parts list and ***engineering manuals***.
4. Mount/install parts and electronic units	4.1 Materials/parts list and engineering manuals are correctly read and interpreted. 4.2 ***Parts and electronic units*** are matched with the materials/parts list for the particular requirements of the job. 4.3 Parts and electronic units are positioned and secured into dash panel of an ***automotive vehicle body*** as per the relevant drawings/instructions. 4.4 Specified nuts, bolts and screws are tensioned to the specified torque requirements stated in the engineering manuals and ***standard operation sheet*** 4.5 Identified faults are recorded, reported and rectified/scrapped in accordance with company procedures.
5. Route service lines	5.1 Materials/parts list and engineering manuals are correctly read and interpreted. 5.2 Appropriate hardware parts are selected and used according to specifications. 5.3 ***Service lines*** are routed, tied and clipped to specification. 5.4 Workflow and production output are recorded and maintained.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Requirements for the Job	1.1. Production schedule per assembly line 1.2. Work Order Note: 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.
2. Point of fit	This includes the different work stations in the assembly line like: 2.1. Main stream lines or on-line assembly stations 2.2. Off-line assembly stations
3. Tools and equipment	3.1. Hand tools 3.2. Torque wrenches 3.3. Power or pneumatic impact guns/wrenches 3.4. Mechanized or manual Conveyors 3.5. Tow motors 3.6. Forklifts 3.7. Hand pallet truck (manual and mechanized)
4. Hardware parts	Hardware parts may include and but not limited to: 4.1. Nuts 4.2. Bolts 4.3. Screws 4.4. Fasteners 4.5. Washers
5. Engineering manuals	5.1. Vehicle assembly manuals per model-variant 5.2. Vehicle quality standard manuals per model-variant 5.3. Process control Chart/sheets 5.4. Vehicle Specification sheets 5.5. Materials/Parts list
6. Parts and electronic units	Parts are located in warehouse area and may include but not limited to: 6.1. Panel instrument electrical wiring harness 6.2. Combination meter assembly 6.3. Electrical switches include but not limited to: • Hazard • Defogger • Park light, turn signal and Headlight

	• Windshield washer • Fog lamp 6.4. Air conditioning control switch 6.5. Electrical relays and fuses Materials may include but not limited to: 6.6. Sealants, adhesive, tapes and consumables that are located in warehouse stores.
7. Automotive vehicle body	7.1. Passenger car 7.2. Utility vehicle
8. Standard operation sheet	Type of standard operation sheet may include: 8.1. Procedural 8.2. Operational
9. Service lines	9.1. Electrical Wiring harness 9.2. Cables

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Obtained parts and materials for the job. 1.2 Interpreted materials/parts list and engineering drawings with the requirements for the job. 1.3 Selected appropriate parts, materials and set of tools and equipment. 1.4 Mounted/Installed electrical parts and electronic units into dash panel instrument to specification. 1.5 Ensured specified nuts, bolts and screws are tensioned to the specified torque requirements. 1.6 Routed service lines in accordance with engineering drawings/manuals. 1.7 Employed safe working practices.
2 Underpinning knowledge and attitudes	2.1 Parts/components and materials differentiation and classification 2.2 Components and their purpose within the assembly 2.3 Particular application or use of material handling equipment 2.4 Company policies and procedures 2.5 Company OH&S procedures 2.6 Maintenance and calibration of Torque wrench 2.7 Work values and ethics 2.8 Punctuality at workplace area
3 Underpinning skills	3.1 Read and interpret engineering drawings 3.2 Proper use of pneumatic impact guns and torque wrenches 3.3 Participate in workplace meetings and discussions 3.4 Compute basic mathematical operation of addition, subtraction, division and multiplication 3.5 Gather and provide information in response to workplace requirements
4 Resource implications	The following resources **MUST** be provided: 4.1 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 and drawings
5 Method of assessment	Competency **MUST** be assessed through: 5.1 Direct Observation with questioning 5.2 Oral interview and written test 5.3 Portfolio assessment
6 Context of assessment	6.1 Competency may be assessed individually in the actual workplace or a simulated workplace environment. 6.2 Practical skills must take place only after a period of supervised practice and repetitive experience. 6.3 Prescribe outcome must be able to achieve without direct supervision.

UNIT OF COMPETENCY : **INSTALL/ FIT OUT ELECTRICAL PARTS TO EXTERIOR AND ENGINE ROOM COMPARTMENT**

UNIT CODE : **ALT827304**

UNIT DESCRIPTOR : This unit identifies the competence required for the preparation, delivery and installation/fitting out of electrical parts to exterior and engine room compartment of automotive vehicle body in accordance with company standards.

ELEMENT	PERFORMANCE CRITERIA *Italicized* terms are elaborated in the Range of Variables
1. Obtain parts for job.	1.1 Materials/parts list is read and interpreted to establish ***requirements for the job***. 1.2 Parts and materials are picked by matching part numbers and stacked in the warehouse bin/container and floor stack areas. 1.3 Parts/components and materials are delivered to respective ***point of fit*** to ensure smooth and continuous production.
2. Select and use tools and equipment	2.1 ***Tools and equipment*** are selected to meet job requirements. 2.2 Tools and equipment are checked to ensure they are in good working order.
3. Select and use hardware parts	3.1 ***Hardware parts*** are identified and selected to meet the job requirements as stated in the materials/parts list. 3.2 Hardware parts are fitted in the required number to the designated positions stated in the materials/parts list and ***engineering manuals***.
4. Mount/ install electrical parts	4.1 Materials/parts list and engineering drawings are correctly read and interpreted. 4.2 ***Parts*** are matched with the materials/parts list for the particular requirements of the job. 4.3 Parts are positioned and secured into ***automotive vehicle body*** as per the relevant drawings/instructions. 4.4 Specified nuts, bolts and screws are tensioned to the specified torque requirements stated in the engineering manuals and standard operating sheet. 4.5 Identified faults are recorded, reported and rectified/scrapped in accordance with company procedures.
5. Route service lines	5.1 Materials/parts list and engineering manuals are correctly read and interpreted. 5.2 Appropriate hardware parts are selected and used according to specifications. 5.3 ***Service lines*** are routed, tied and clipped to specification. 5.4 Workflow and production output are recorded and maintained.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Requirements for the Job	1.1. Production schedule per assembly lines per day 1.2. Work Order Note: 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.
2. Point of fit	This includes the different work stations in the assembly line like: 2.1. Main stream lines or on-line assembly stations 2.2. Off-line assembly stations
3. Tools and equipment	3.1. Hand tools 3.2. Torque wrenches 3.3. Power or pneumatic impact guns/wrenches 3.4. Mechanized or manual Conveyors 3.5. Tow motors 3.6. Forklifts 3.7. Hand pallet truck (manual and mechanized)
4. Hardware parts	Hardware parts may include and but not limited to: 4.1. Nuts 4.2. Bolts 4.3. Screws 4.4. Fasteners 4.5. Washers
5. Engineering manuals	5.1. Vehicle assembly manuals per model-variant 5.2. Vehicle quality standard manuals per model-variant 5.3. Process control Chart/sheets 5.4. Vehicle Specification sheets 5.5. Materials/Parts list
6. Parts	Parts may include and but not limited to: 6.1. Engine room wiring harness with fuse/relay box 6.2. Wiper motor assembly 6.3. Relays 6.4. Fuses 6.5. Voltage regulator 6.6. Battery 6.7. Headlights

	6.8. Park lights 6.9. Rear combination lamps 6.10. Front turn signal lights 6.11. Third brake lamp
7. Automotive vehicle body	7.1. Passenger car 7.2. Utility vehicle
8. Standard operation sheet	Type of standard operation sheet may include: 8.1. Procedural 8.2. Elemental
9. Service lines	9.1. Electrical Wiring harness 9.2. Cables

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Obtained parts and materials for the job. 1.2 Interpreted materials/parts list and engineering drawings with the requirements for the job. 1.3 Selected appropriate parts, materials and set of tools and equipment. 1.4 Mounted/Installed electrical parts to exterior and engine room compartment to specification. 1.5 Ensured specified nuts, bolts and screws are tensioned to the specified torque requirements. 1.6 Routed service lines in accordance with engineering drawings/manuals. 1.7 Employed safe working practices.
2 Underpinning knowledge and attitudes	2.1 Parts/materials differentiation and classification 2.2 Components and their purpose within the assembly 2.3 Particular application or use of material handling equipment 2.4 Company policies and procedures 2.5 Company OH&S procedures 2.6 Maintenance and calibration of Torque wrench 2.7 Work values and ethics 2.8 Punctuality at workplace area
3 Underpinning skills	3.1 Read and interpret engineering drawings 3.2 Proper use of pneumatic impact guns and torque wrenches 3.3 Participate in workplace meetings and discussions 3.4 Compute basic mathematical operation of addition, subtraction, division and multiplication 3.5 Gather and provide information in response to workplace requirements
4 Resource implications	The following resource **MUST** be provided: 4.1 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 and drawings
5 Method of assessment	Competency **MUST** be assessed through: 5.1 Direct Observation with questioning 5.2 Oral interview and written test 5.3 Portfolio
6 Context of assessment	6.1 Competency may be assessed individually in the actual workplace or a simulated workplace environment. 6.2 Practical skills must take place only after a period of supervised practice and repetitive experience. 6.3 Prescribe outcome must be able to achieve without direct supervision.

UNIT OF COMPETENCY : INSTALL/ FIT OUT AUDIO AND VIDEO SYSTEMS

UNIT CODE : **ALT827305**

UNIT DESCRIPTOR : This unit identifies the competence required for the preparation, delivery and installation/fitting out of audio and video systems to automotive vehicle body in accordance with company standards.

ELEMENT	PERFORMANCE CRITERIA *Italicized* terms are elaborated in the Range of Variables
1. Obtain parts for job.	1.1 Materials/parts list is read and interpreted to establish ***requirements for the job***. 1.2 Parts/electronic units and materials are picked by matching part numbers and stacked in the warehouse bin/container and floor stack areas. 1.3 Parts/components and materials are delivered to respective ***point of fit*** to ensure smooth and continuous production.
2. Select and use tools and equipment	2.1 ***Tools and equipment*** are selected to meet job requirements. 2.2 Tools and equipment are checked to ensure they are in good working order.
3. Select and use hardware parts	3.1 ***Hardware parts*** are identified and selected to meet the job requirements as stated in the materials/parts list. 3.2 Hardware parts are fitted in the required number to the designated positions stated in the materials/parts list and associated ***engineering manuals*.**
4. Mount/install electrical parts and electronic units	4.1 Materials/parts list and engineering drawings are correctly read and interpreted. 4.2 ***Parts and electronic units*** are matched with the materials/parts list for the particular requirements of the job. 4.3 Parts and electronic units are positioned and secured into ***automotive vehicle body*** as per the relevant drawings/instructions. 4.4 Specified nuts, bolts and screws are tensioned to the specified torque requirements stated in the engineering manuals and standard operating sheet. 4.5 Identified faults are recorded, reported and rectified/scrapped in accordance with company procedures.
5. Route service lines	5.1 Materials/parts list and engineering manuals are correctly read and interpreted. 5.2 Appropriate hardware parts are selected and used according to specifications. 5.3 ***Service lines*** are routed, tied and clipped to specification. 5.4 Workflow and production output are recorded and maintained.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Requirements for the Job	1.1. Production schedule per assembly lines per day 1.2. Work Order Note: 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.
2. Point of fit	This includes the different work stations in the assembly line like: 2.1. Main stream lines or on-line assembly stations 2.2. Off-line assembly stations
3. Tools and equipment	3.1. Hand tools 3.2. Power or pneumatic impact guns/wrenches 3.3. Mechanized or manual Conveyors 3.4. Tow motors 3.5. Forklifts 3.6. Hand pallet truck (manual and mechanized)
4. Hardware parts	Hardware parts may include and but not limited to: 4.1. Nuts 4.2. Bolts 4.3. Screws 4.4. Fasteners 4.5. Washers
5. Engineering manuals	5.1. Vehicle assembly manuals per model-variant 5.2. Vehicle quality standard manuals per model-variant 5.3. Process control Chart/sheets 5.4. Vehicle Specification sheets 5.5. Materials/Parts list
6. Parts and electronic units	Parts / components may include but not limited to: 6.1. Radio assembly • One din type with tuner and cd player • Two din type with tuner, cd and tape players 6.2. Speakers 6.3. Amplifier 6.4. Cables and wires 6.5. Video system • Dash board installed type

	• Ceiling installed type • Headrest installed type • Multi-points installed type at dash board and headrests
7. Automotive vehicle body	7.1. Passenger car 7.2. Utility vehicle
8. Standard operation sheet	Type of standard operation sheet may include: 8.1. Procedural 8.2. Elemental
9. Service lines	9.1. Electrical Wiring harness 9.2. Cables

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1. Obtained parts and materials for the job. 1.2. Interpreted materials/parts list and engineering drawings with the requirements for the job. 1.3. Selected appropriate parts, materials and set of tools and equipment. 1.4. Mounted/Installed parts and electronic units of audio and video systems into automotive vehicle body to specification. 1.5. Ensured specified nuts, bolts and screws are tensioned to the specified torque requirements. 1.6. Routed service lines in accordance with engineering drawings/manuals. 1.7. Employed safe working practices.
2. Underpinning knowledge and attitudes	2.1. Parts/materials differentiation and classification 2.2. Components and their purpose within the assembly 2.3. Particular application or use of material handling equipment 2.4. Company policies and procedures 2.5. Company OH&S procedures 2.6. Maintenance and calibration of Torque wrench 2.7. Work values and ethics 2.8. Punctuality at workplace area
3. Underpinning skills	3.1. Read and interpret engineering drawings 3.2. Proper use of pneumatic impact guns and torque wrenches 3.3. Participate in workplace meetings and discussions 3.4. Compute basic mathematical operation of addition, subtraction, division and multiplication 3.5. Gather and provide information in response to workplace requirements
4. Resource implications	The following resources **MUST** be provided: 4.1. 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 and drawings
5. Method of assessment	Competency **MUST** be assessed through: 5.1. Direct Observation with questioning 5.2. Oral interview and written test 5.3. Portfolio
6. Context of assessment	6.1. Competency may be assessed individually in the actual workplace or a simulated workplace environment. 6.2. Practical skills must take place only after a period of supervised practice and repetitive experience. 6.3. Prescribe outcome must be able to achieve without direct supervision.

UNIT OF COMPETENCY: PERFORM HEADLIGHT FOCUS AIMING OPERATIONS

UNIT CODE : **ALT827306**

UNIT DESCRIPTOR : This unit identifies the competence required to perform headlight focus aiming operations within the motor vehicle assembly Industry.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Prepare for the job	1.1 Work specification is read and interpreted to determine alignment process. 1.2 ***Tools and equipment*** are determined and selected to meet requirements for the job.
2. Perform headlight focus aiming operations	2.1 Headlight alignment equipment information is accessed and interpreted from manufacturer specifications. 2.2 Headlight alignment procedures are undertaken in accordance with ***company procedures***. 2.3 Adjustments are undertaken in accordance with the vehicle and equipment manufacturer's specifications. 2.4 Headlight alignment procedures are carried out and documentation completed in accordance with company procedures/policies.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Tools and equipment	1.1. Hand tools 1.2. Special tools 1.3. Headlight aiming focus equipment
2. Company procedures	2.1. Equipment manufacturer specifications 2.2. Vehicle manufacturer specifications 2.3. Wearing of personal protective equipment like: • Safety shoes • Safety gloves • Apron

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1. Performed equipment set up for alignment 1.2. Interpreted alignment information 1.3. Aligned headlights to specifications 1.4. Used relevant tools and equipment 1.5. Completed documentation requirements 1.6. Employed safe working practices.
2. Underpinning knowledge and attitudes	2.1. Headlight alignment principles and purposes 2.2. Equipment operating principles and alignment procedures 2.3. Company policies and procedures 2.4. Company OH&S procedures 2.5. Maintenance and calibration of Torque wrench 2.6. Work values and ethics 2.7. Punctuality at workplace area
3. Underpinning skills	3.1. Safe use of wheel alignment machine. 3.2. Participate in workplace meetings and discussions 3.3. Complete work related documents 3.4. Compute basic mathematical operation of addition, subtraction, division and multiplication 3.5. Gather and provide information in response to workplace requirements
4. Resource implications	The following resources **MUST** be provided: 4.1. Vehicle to be used for headlight alignment procedure. 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 **MUST** be assessed through: 5.1. Direct Observation on or off-the-job 5.2. Oral interview and written test 5.3. Portfolio assessment
6. Context of Assessment	6.1. Competency may be assessed individually in the actual workplace or a simulated workplace environment. 6.2. Practical skills must take place only after a period of supervised practice and repetitive experience. 6.3. Prescribe outcome must be able to achieve without direct supervision.

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 II.

3.1 CURRICULUM DESIGN

Course Title: **AUTOMOTIVE ELECTRICAL ASSEMBLY** NC Level **NC II**

Nominal Training Duration: **18 Hours** (Basic Competencies)
20 Hours (Common Competencies)
105 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 competencies such as: install/fit out electrical parts and electronic units to engine assembly, dash panel instruments, interior, exterior and engine room compartment of automotive vehicle body in accordance with manufacturer's specification. It also covers competencies to install audio and video systems and perform headlight focus aiming operations.

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

BASIC COMPETENCIES
(18 Hours)

Unit of Competency	Learning Outcomes	Methodology	Assessment Approach
1. Participate in workplace communication	1.1 Obtain and convey workplace information 1.2 Participate in workplace meeting and discussions 1.3 Complete relevant work related documents	• Group discussion • Interaction • Lecture • Reportorial	• Written test • Practical/ performance test • Interview
2. Work in a team environment	2.1 Describe and identify team role and responsibility in a team. 2.2 Describe work as a team member.	• Group discussion • Case studies • Simulation	• Written test • Observation • Simulation • Role playing

Unit of Competency	Learning Outcomes	Methodology	Assessment Approach
3. Practice career professionalism	3.1 Integrate personal objectives with organizational goals 3.2 Set and meet work priorities 3.3 Maintain professional growth and development	• Interactive lecture • Structure activity • Simulation • Demonstration • Self-paced instruction	• Role play • Interview • Written examination
4. Practice occupational health and safety procedures	4.1 Evaluate hazards and risks 4.2 Control hazards and risks 4.3 Maintain occupational health and safety awareness	• Interactive lecture • Simulation • Symposium • Group dynamics • Film viewing	• Situational analysis • Interview • Practical examination • Written exam • Portfolio assessment

COMMON COMPETENCIES
(20 Hours)

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	• Lecture/ Demonstration • Practical exercises • Simulation	• Written test • Oral questioning • Direct observation
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	• Lecture/ Demonstration • Dual training	• Direct observation • Interview
3. Move and position vehicle	3.1 Prepare vehicle for driving 3.2 Move and position vehicle 3.3 Check the vehicle	• Lecture/ Demonstration • Practical exercises • Simulation	• Written test • Oral questioning • Direct observation
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	• Lecture/ Demonstration • Dual training • Distance learning	• Written test • Oral questioning • Direct observation • Interview

Unit of Competency	Learning Outcomes	Methodology	Assessment Approach
			• Project method
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	• Lecture/ Demonstration • Dual training • Self-paced (modular)	• Written test • Direct observation • Interview • Practical exercises

CORE COMPETENCIES
(105 Hours)

Unit of Competency	Learning Outcomes	Methodology	Assessment Approach
1. Install/fit out electrical parts to engine assembly	1.1 Obtain materials/parts for job 1.2 Select and use tools and equipment 1.3 Load and unload parts into assembly jigs/fixtures 1.4 Select and use hardware parts 1.5 Mount/install electrical parts 1.6 Route service lines	• Lecture/ Demonstration • Dual training	• Demonstration w / questioning • Observation w/ questioning • Interview • Portfolio
2. Install/fit out electrical parts and electronic units to body interior compartment	2.1 Obtain materials/parts for job 2.2 Select and use tools and equipment 2.3 Select and use hardware parts 2.4 Mount/install parts and electronic units 2.5 Route service lines	• Lecture/ Demonstration • Dual training	• Demonstration w/ questioning • Observation w/ questioning • Interview • Portfolio
3. Install/fit out of electrical parts and electronic units to dash panel instrument	3.1 Obtain materials/parts for job 3.2 Select and use tools and equipment 3.3 Select and use hardware parts 3.4 Mount/install parts and electronic units 3.5 Route service lines	• Lecture/ Demonstration • Dual training	• Demonstration w/ questioning • Observation w/ questioning • Interview • Portfolio
4. Install/fit out of electrical parts to exterior and engine room compartment	4.1 Obtain materials/parts for job 4.2 Select and use tools and equipment 4.3 Select and use hardware parts 4.4 Mount/install parts and	• Lecture/ Demonstration • Dual training	• Demonstration w/ questioning • Observation w/ questioning • Interview • Portfolio

Unit of Competency	Learning Outcomes	Methodology	Assessment Approach
	electronic units 4.5 Route service lines		
5. Install/fit out audio and video systems	5.1 Obtain materials/parts for job 5.2 Select and use tools and equipment 5.3 Select and use hardware parts 5.4 Mount/install parts and electronic units 5.5 Route service lines	• Lecture/ Demonstration • Dual training	• Demonstration w/ questioning • Observation w/ questioning • Interview • Portfolio
6. Perform headlight focus aiming operations	6.1 Prepare for the job 6.2 Perform headlight focus aiming operations	• Lecture/ Demonstration • Dual training	• Demonstration w/ questioning • Observation w/ questioning • Interview • Portfolio

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 good moral character; and

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 ELECTRICAL ASSEMBLY NC II

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

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	1 set 1 set 1 lot	Training materials Office supplies Hardware Parts
2 pcs	Impact wrench ¾ drive	1 unit	Forklift (2 to 3 Tons)	1set	Parts for engine assembly
2 pcs	Impact wrench ½ drive	2 units	Hand Pallet Truck	1 set	Parts interior compartment
2 pcs	Torque wrench - click type	1 set	Mechanized or manual conveyors (optional)	1 set	Parts exterior compartment
2 pcs	Torque wrench – dial type	I unit	Tow motor	1 set	Parts for engine room compartment
2 sets	Special tools (assorted)	1 set	Headlight focusing equipment	1 set	Parts for dash panel instrument
2 pcs	Rubber Mallet	1 set	Assorted Jigs/fixtures	1 set	Parts for audio and video systems
		1 set	Sealer gun - pneumatic	1 set	Sealants
		1 set	Jigs/fixtures	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

3.5 TRAINING FACILITIES
AUTOMOTIVE ELECTRICAL ASSEMBLY NC II

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 electrical assembly of automotive vehicle body. Most of the learning activities such as on-vehicle electrical 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	-	-	**159.75**

3.6 TRAINERS' QUALIFICATION
AUTOMOTIVE/LAND TRANSPORT SECTOR

AUTOMOTIVE ELECTRICAL ASSEMBLY NC II

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) or equivalent in training/experience
- Must be computer literate
- Must be physically and mentally fit
- *Must have at least 2 years job/industry experience
- Must be a civil service eligible (for government position) or holder of appropriate professional license issued by the Professional Regulatory Commission

* 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 II, 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 II 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 Install/Fit Out Electrical Parts to Engine Assembly
- Install/Fit Out Electrical Parts Engine Assembly

4.2.2 Install/Fit Out Electrical Parts and Electronic Unit to Body Interior/ Exterior and Engine Compartments
- Install/Fit Out Electrical Parts and Electronic Unit to Body Interior Compartment
- Install/Fit Out Electrical Parts and Electronic Units to Dash Instrument Panel
- Install/Fit Out Electrical Parts to Exterior and Engine Compartment
- Install/Fit Out Audio and Video Systems

4.2.3 Perform Headlight Focus Aiming Operations
- Perform Headlight Focus Aiming Operations

Successful candidates shall be awarded Certificates of Competency (COC).

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 Graduates of formal, non-formal and informal including enterprise-based training programs.

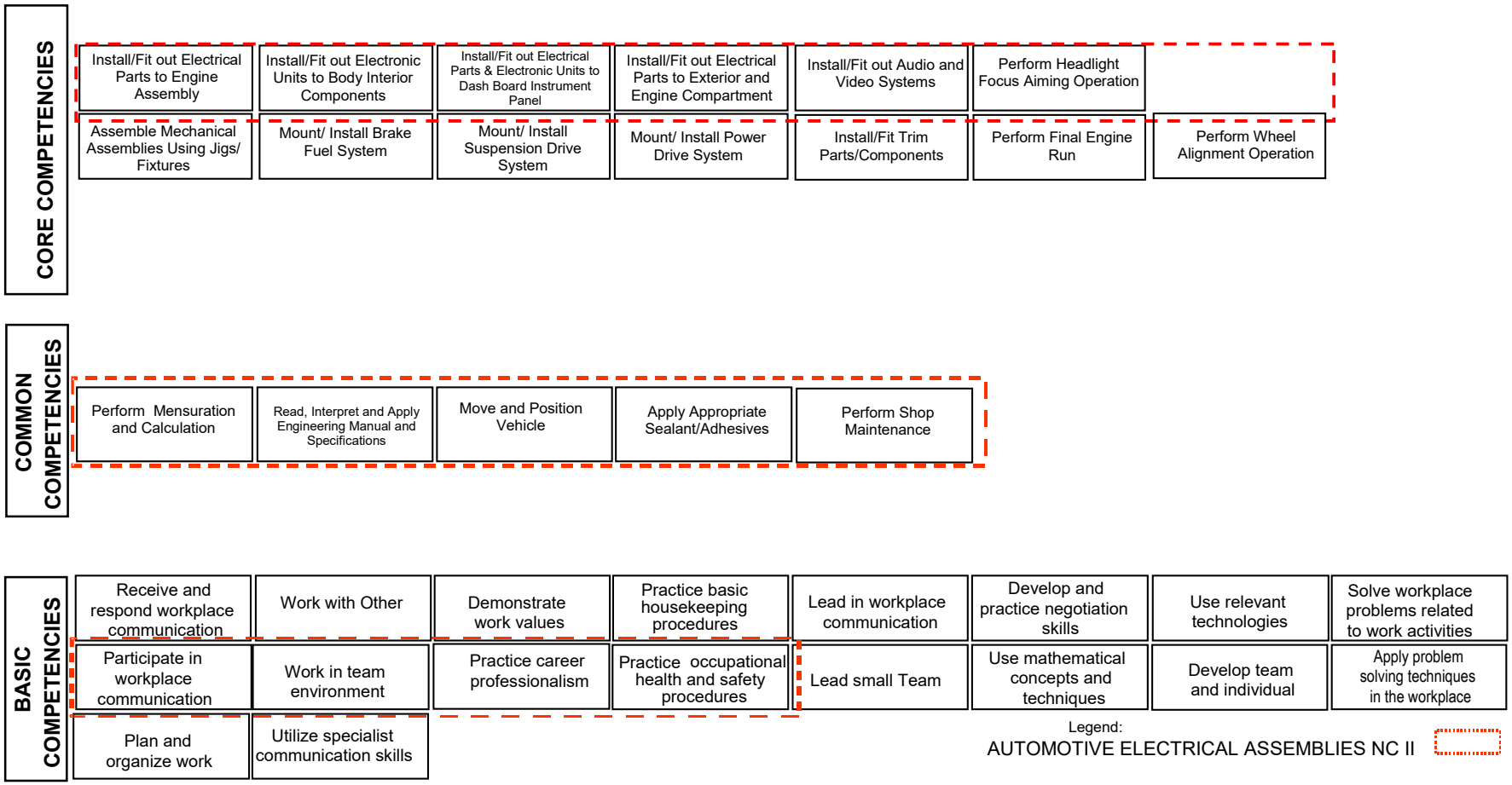
4.5.2 Experienced workers (wage employed or self employed)

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 (PTOQCS)”.

ANNEX A

COMPETENCY MAP- AUTOMOTIVE SECTOR
MANUFACTURING SUB SECTOR
(ASSEMBLY)

AUTOMOTIVE ELECTRICAL ASSEMBLY NC II



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.

ACKNOWLEDGEMENT

The Technical Education and Skills Development Authority (TESDA) wishes to extend thanks and appreciation to the many representatives of business, industry, academe and government agencies who rendered their time and expertise to the development and validation of this Training Regulation.

THE TECHNICAL AND INDUSTRY EXPERT PANEL

Automotive Electrical Assembly

NMPI / CATC/PAFI

Antonio A. Gimenez- Executive Director - CATC/PAFI	**Rodolfo T. Nunez-** Plant Manager-Nissan Motors Phils. Inc.(NMPI) CATC/PAFI	**Rene Torres** (Labor Representative) Nissan Motors Philippines Workers Union-AIWA Nissan TechnoPark Bo. Pulong, Sta. Cruz Laguna
Mr. Valentino de Leon VP- Plant Adminstration-NMPI	**Edgardo P. Zaragoza-** Paint Shop Manager- NMPI (CATC/PAFI)	**Carina J. Bondad-** Administrative Support Staff, (CATC/PAFI)

The PARTICIPANTS in the National Validation of this Training Regulation

ROBERTS RADIATOR	**PILIPINAS HINO INC.**	**NISSAN MOTOR PHILIPPINES INC.**

Members of the TESDA Board

The MANAGEMENT and STAFF of the TESDA Secretariat

TESDA EXCOM

Qualification and Standards Office

Florante P. Inoturan

Agnes P. Panem

Abel B. Elpedes

List of Published Training Regulations

- Animal Production NC II
- Aquaculture NC II
- Automotive Body Painting/Finishing NC II
- Automotive Body Repair NC II
- Automotive Engine Rebuilding NC II
- AUTOMOTIVE ELECTRICAL ASSEMBLY NC II
- Bartending NC II
- Building Wiring Installation NC II
- Carpentry NC II
- Commercial Cooking NC II
- Computer Hardware Servicing NC II
- Deck Seafaring NC II
- Dressmaking NC II
- Driving NC II
- Engine Seafaring NC II
- Food and Beverage Services NC II
- Footwear Making NC II
- Heavy Equipment Operation NC II
- Horticulture NC II
- Household Services NC II
- Housekeeping NC II
- Machining NC II
- Masonry NC II
- Motorcycle and Small Engine Servicing NC II
- Plumbing NC II
- Pyrotechnics NC II
- RAC Servicing NC I
- RAC Servicing NC II
- Security Services NC II
- Tailoring NC II
- Tour Guiding Services NC II
- Transport RAC Servicing NC II
- Travel Services NC II
- Welding NC II

These materials are available in both printed and electronic copies.
For more information please contact:

Technical Education and Skills Development Authority (TESDA)
Telephone Nos.: 893-8303, 893-2139; 817-4076 to 82 loc. 615 to 617
or visit our website: www.tesda.gov.ph