



		Curriculum Document			
Curriculum Code		Curriculum Title		Logo	
684904000		Panel Beater			
	Name	Email	Phone	Logo	
Development Quality Partner	Metal Engineering and Related Services (MERSETA)	smgidi@merseta.org.za	010 2193457		

Table of content

SECTION 1: CURRICULUM SUMMARY	4
1. Occupational Information	4
1.1 Associated Occupation	4
1.2 Occupation or Specialisation Addressed by this Curriculum	4
1.3 Alternative Titles used by Industry	4
2. Curriculum Information.....	4
2.1 Curriculum Structure	4
2.2 Entry Requirements.....	5
3. Assessment Quality Partner Information	5
4. Part Qualification Curriculum Structure.....	5
SECTION 2: OCCUPATIONAL PROFILE	6
1. Occupational Purpose.....	6
2. Occupational Tasks.....	6
3. Occupational Task Details	6
3.1. Performing automotive body repairs (NQF Level 4).....	6
3.2. Removing and refitting automotive mechanical components (NQF Level)	Error! Bookmark not defined.
3.3. Performing auto-electrical activities (NQF Level 3).....	7
3.4. Analysing damage to vehicle (NQF Level 4).....	8
SECTION 3: CURRICULUM COMPONENT SPECIFICATIONS.....	9
SECTION 3A: KNOWLEDGE MODULE SPECIFICATIONS.....	9
1. 684904000-KM-01, Automotive Body Repairs Theory, NQF Level 4, Credits 45.....	10
2. 684904000-KM-02, Automotive Mechanical Theory , NQF Level 3, Credits 44	21
3. 684904000-KM-03, Auto-electrical Theory, NQF Level 3, Credits 44.....	30
4. 684904000-KM-04, Analysis of damage, NQF Level 4, Credits 18	38
SECTION 3B: PRACTICAL SKILL MODULE SPECIFICATIONS	41
1. 684904000-PM-01, Remove and refit automotive body components , NQF Level 3, Credits 20	42
2. 684904000-PM-02, Perform basic repairs to vehicle body, NQF Level 3, Credits 76	48
3. 684904000-PM-03, Perform advanced repairs to vehicle body and structure, NQF Level 4, Credits 60	58

4. 684904000-PM-04, Remove and refit vehicle mechanical components and perform wheel alignment, NQF Level 4, Credits 30	61
5. 684904000-PM-05, Remove and replace auto-electrical components and perform diagnostics, NQF Level 3, Credits 26	68
6. 684904000-PM-06, Analyse damage in terms of the job card and report to supervisor, NQF Level 4, Credits 40	75
SECTION 3C: WORK EXPERIENCE MODULE SPECIFICATIONS	78
1. 684904000-WM-01, Removal and replacement processes for a range of automotive body components and trim in an auto-body workshop, NQF Level 3, Credits 16	79
2. 684904000-WM-02, Basic repairs to vehicle body, NQF Level 3, Credits 44	82
3. 684904000-WM-03, Major repairs to vehicle body, NQF Level 4, Credits 68	86
4. 684904000-WM-04, Removal and replacement of mechanical components, NQF Level 3, Credits 28	89
5. 684904000-WM-05, Removal and refitting of a auto-electrical components and performing basic fault-finding, NQF Level 3, Credits 12	92
6. 684904000-WM-06, Analysis of damage against the job card, NQF Level 4, Credits 8	95
7. 684904000-WM-07, Structured planning and communication processes in the workplace, NQF Level 4, Credits 4	97
SECTION 4: STATEMENT OF WORK EXPERIENCE	100

SECTION 1: CURRICULUM SUMMARY

1. Occupational Information

1.1 Associated Occupation

684904: Panel Beater

1.2 Occupation or Specialisation Addressed by this Curriculum

684904000: Panel Beater

1.3 Alternative Titles used by Industry

- Auto-body repairer
- Chassis straightener

2. Curriculum Information

2.1 Curriculum Structure

This qualification is made up of the following compulsory Knowledge and Practical Skill Modules:

Knowledge Modules:

- 684904000-KM-01, Automotive Body Repairs Theory, NQF Level 4, Credits 45
- 684904000-KM-02, Automotive Mechanical Theory , NQF Level 3, Credits 44
- 684904000-KM-03, Auto-electrical Theory, NQF Level 3, Credits 44
- 684904000-KM-04, Analysis of damage, NQF Level 4, Credits 18

Total number of credits for Knowledge Modules: 151

Practical Skill Modules:

- 684904000-PM-01, Remove and refit automotive body components , NQF Level 3, Credits 20
- 684904000-PM-02, Perform basic repairs to vehicle body, NQF Level 3, Credits 76
- 684904000-PM-03, Perform advanced repairs to vehicle body and structure, NQF Level 4, Credits 60
- 684904000-PM-04, Remove and refit vehicle mechanical components and perform wheel alignment, NQF Level 4, Credits 30
- 684904000-PM-05, Remove and replace auto-electrical components and perform diagnostics, NQF Level 3, Credits 26
- 684904000-PM-06, Analyse damage in terms of the job card and report to supervisor, NQF Level 4, Credits 40

Total number of credits for Practical Skill Modules: 252

This qualification also requires the following Work Experience Modules:

- 684904000-WM-01, Removal and replacement processes for a range of automotive body components and trim in an auto-body workshop, NQF Level 3, Credits 16
- 684904000-WM-02, Basic repairs to vehicle body, NQF Level 3, Credits 44
- 684904000-WM-03, Major repairs to vehicle body, NQF Level 4, Credits 68
- 684904000-WM-04, Removal and replacement of mechanical components, NQF Level 3, Credits 28
- 684904000-WM-05, Removal and refitting of a auto-electrical components and performing basic fault-finding, NQF Level 3, Credits 12
- 684904000-WM-06, Analysis of damage against the job card, NQF Level 4, Credits 8
- 684904000-WM-07, Structured planning and communication processes in the workplace, NQF Level 4, Credits 4

Total number of credits for Work Experience Modules: 180

2.2 Entry Requirements

3. Assessment Quality Partner Information

Name of body:

Address of body:

Contact person name:

Contact person work telephone number:

4. Part Qualification Curriculum Structure

No part qualification are applicable

SECTION 2: OCCUPATIONAL PROFILE

1. Occupational Purpose

A Panel Beater repairs damages to metal, composites (including fibre glass, rubber, plastic) on a vehicle and forms replacement body panels. The qualification also aims to address a range of related occupations like that of autobody repairer, automotive trimmer, chassis straightener, rust repairer, vehicle finisher. The competencies which the learner will acquire will him/her to perform a range of activities to repair/rehabilitate a damaged vehicle.

2. Occupational Tasks

- Performing automotive body repairs (NQF Level 4)
- Removing and refitting vehicle mechanical components and perform wheel alignment (NQF Level 3)
- Performing auto-electrical activities (NQF Level 3)
- Analysing damage to vehicle (NQF Level 4)

3. Occupational Task Details

3.1. Performing automotive body repairs (NQF Level 4)

Unique Product or Service:

Repaired vehicle body

Occupational Responsibilities:

- Select and care for hand, power and specialised tools
- Remove and refit a dashboard, navigation or display screen and multi media system
- Remove and replace interior trim
- Remove and replace exterior trim and moulding
- Remove and refit automotive bonded glass
- Weld, cut and braze
- Repair minor dents
- Remove dents without painting them (PDR)
- Remove, replace and align bolt on body panels
- Remove, strip, repair, reassemble, replace and align door panels
- Repair deformed ferrous metal panels
- Prepare body surface for painting
- Repair and align welded fenders and roof panels (ferrous)
- Repair non-ferrous metal body panels
- Repair non-metal components
- Perform structural alignment on vehicle

Occupational Contexts:

- Removal and replacement processes for a range of automotive body components in an auto-body workshop.
- Basic repairs to vehicle body in an auto-body shop
- Advanced repairs to vehicle body in an auto-body shop

3.2. Removing and refitting vehicle mechanical components and perform wheel alignment (NQF Level 3)**Unique Product or Service:**

Replaced automotive mechanical components

Occupational Responsibilities:

- Remove and refit cooling system components
- Remove and refit suspension components
- Remove and refit drive train components
- Remove and refit fuel tank
- Remove and refit air conditioner components
- Remove and refit wheels
- Perform wheel alignment

Occupational Contexts:

- Removal and refitting processes for mechanical components

3.3. Performing auto-electrical activities (NQF Level 3)**Unique Product or Service:**

Replaced auto-electrical components and diagnosis of auto-electrical system

Occupational Responsibilities:

- Remove and refit a sectional wiring harness
- Remove and refit a battery
- Remove and refit vehicle lights
- Remove and refit electric window mechanism and sunroof
- Remove and refit SRS components
- Remove and refit sensors and cameras
- Perform fault-finding using diagnostic tool

- Perform fault-finding using multimeter

Occupational Contexts:

- Removal and refitting of auto-electrical components and performing basic fault-finding

3.4. Analysing damage to vehicle (NQF Level 4)

Unique Product or Service:

Vehicle damage analysis

Occupational Responsibilities:

- Analyse damage to vehicle against job card
- Use communication skills

Occupational Contexts:

- Analysis of damage to vehicle against job card

SECTION 3: CURRICULUM COMPONENT SPECIFICATIONS

SECTION 3A: KNOWLEDGE MODULE SPECIFICATIONS

List of Knowledge Modules for which Specifications are included

- 684904000-KM-01, Automotive Body Repairs Theory, NQF Level 4, Credits 45
- 684904000-KM-02, Automotive Mechanical Theory , NQF Level 3, Credits 44
- 684904000-KM-03, Auto-electrical Theory, NQF Level 3, Credits 44
- 684904000-KM-04, Analysis of damage, NQF Level 4, Credits 18

1. 684904000-KM-01, Automotive Body Repairs Theory, NQF Level 4, Credits 45

1.1 Purpose of the Knowledge Modules

The main focus of the learning in this knowledge module is to build an understanding of cover aspects like vehicle body construction, materials used in automotive body construction, vehicle body repair processes, removing and refitting vehicle body parts, welding, cutting, brazing and soldering and removal and replacement of vehicle trim. It is crucial for a panel beater to understand the nature of automotive body repairs and the cost implications thereof. The module also covers aspects of paints and primers, and masking and demasking vehicles.

The learning will enable learners to demonstrate an understanding of:

- KM-01-KT01: Introduction to the Panel Beater Occupation (2%)
- KM-01-KT02: Workplace health, safety and environmental protection (7%)
- KM-01-KT03: Vehicle construction technology (11%)
- KM-01-KT04: Automotive materials used in auto-body construction (7%)
- KM-01-KT05: Automotive tools and equipment (5%)
- KM-01-KT06: Welding, cutting and brazing (15%)
- KM-01-KT07: Dashboards, GPS, navigation and multimedia systems (6%)
- KM-01-KT08: Vehicle trim and moulding (7%)
- KM-01-KT09: Vehicle body repair processes (20%)
- KM-01-KT10: Structural alignment (14%)
- KM-01-KT11: Paints and primers (3%)
- KM-01-KT12: Masking and demasking (3%)

1.2 Guidelines for Topics

1.2.1. KM-01-KT01: Introduction to the Panel Beater Occupation (2%)

Topic elements to be covered include:

- KT0101 Career opportunities for qualified Panel Beaters
- KT0102 Occupational profile of a Panel Beater
- KT0103 Legislation related to the occupation of a Panel Beater [Consumer Protection Act (No. 68 of 2008), Environment Conservation Act, 1989 (Waste Tyre Regulations, 2008), Occupational Health and Safety Act (No. 85 of 1993), Road Traffic Act (No. 93 of 1996)]

Internal Assessment Criteria and Weight

- IAC0101 Describe the job environment and roles of a Panel Beater
- IAC0102 Describe the profile of a Panel Beater in terms of industry description and requirements
- IAC0103 Identify career opportunities in this sector
- IAC0104 Discuss the importance of auto-body workshop accreditation

- IAC0105 Explain the legal aspects pertaining to the Panel Beater occupation

(Weight 2%)

1.2.2. KM-01-KT02: Workplace health, safety and environmental protection (7%)

Topic elements to be covered include:

- KT0201 General overview of occupational health and safety legislation
- KT0202 General workshop safety rules
- KT0203 Workshop accidents
- KT0204 Safety symbols and coding
- KT0205 Types of personal protective equipment
- KT0206 Hazard identification and risk assessment principles
- KT0207 Fundamentals of securing worksites
- KT0208 Hazardous chemical substances and flammable liquids (diesel, petrol, oil) and storage thereof
- KT0209 Refrigerant
- KT0210 Housekeeping rules
- KT0211 Environmental protection and pollution concepts

Internal Assessment Criteria and Weight

- IAC0201 Describe general safe work practices in the panel beating environment
- IAC0202 Identify and describe safety signs and explain the risk and safe conduct associated with them
- IAC0203 Demonstrate the inter-relationship between workplace safety and a productive work environment
- IAC0204 Identify the types of shop accidents and describe measures to prevent them
- IAC0205 Identify and describe hazardous chemical substances, liquids and refrigerant related to automotive body repairs
- IAC0206 Explain the fundamentals of securing worksites
- IAC0207 Discuss the importance of maintaining good housekeeping rules in a work environment
- IAC0208 Explain the environmental regulations concerning storage and disposal of hazardous wastes and describe pollution concepts

(Weight 7%)

1.2.3. KM-01-KT03: Vehicle construction technology (11%)

Topic elements to be covered include:

- KT0301 Body geometry and body design (major body sections, unibody design, body-on-frame)
- KT0302 Ergonomics, styling and variation in body shape (hatch-back, coupe, sedan, station wagon)
- KT0303 Types of chassis structure including bonded chassis structures, formed structures (Ladder Chassis design, Mono-shell or Structural Integrity design and their respective terminology)
- KT0304 Body classifications (outer body construction (skin), inner body construction, front-end assembly, monocoque vehicle body structure)
- KT0305 Types of panels (including welded, bolted, bonded, unibody, riveted)
- KT0306 Floor pan and structural rigidity
- KT0307 Basic engine compartment parts (chassis legs, valance, inner trays, shock towers, firewalls, front panel)
- KT0308 Safety critical components (limb and life parts) (OEM specifications)
- KT0309 Crumple zones

Internal Assessment Criteria and Weight

- IAC0301 Explain the concepts of body geometry, body design, vehicle geometry, ergonomics, styling and variation in body shape
- IAC0302 Discuss the differences between types of chassis and formed structures
- IAC0303 Discuss the various body classifications
- IAC0304 Differentiate between the various types of panels
- IAC0305 Identify and describe the basic engine compartment parts
- IAC0306 Explain the crumple zones surrounding the body design
- IAC0307 Explain the importance of the floor pan in structural rigidity of the vehicle

(Weight 11%)

1.2.4. KM-01-KT04: Automotive materials used in auto-body construction (7%)

Topic elements to be covered include:

- KT0401 Types of materials [steel, coated metal, treated metal, aluminium, synthetics, leathers and the composites (plastics, fibre, rubber), door and bonded glass]
- KT0402 Properties and characteristics of materials
- KT0403 Functions and application of materials
- KT0404 Safety critical components (limb and life parts) (OEM specifications)

Internal Assessment Criteria and Weight

- IAC0401 Identify and describe types of materials (including types of plastics) used in automotive design
- IAC0402 Discuss the properties and characteristics of the materials used in vehicle design
- IAC0403 Describe the use of materials in vehicle is described
- IAC0404 Differentiate between the various types of steel used in vehicle design
- IAC0405 Explain the differences between ferrous and non-ferrous materials
- IAC0406 Describe the effects of temperature on automotive materials

(Weight 7%)

1.2.5. KM-01-KT05: Automotive tools and equipment (5%)

Topic elements to be covered include:

- KT0501 Panel beating equipment [includes hand held, power and specialised tools), screwdrivers, spanners, flat and anvil dolly, flat-faced or round nip hammer, body filler file (speed file), air-powered sanding grinder, induction heater, decal and moulding remover attachment, block attachment for heating windscreen sealer, attachment for heating and loosening rusted bolts]
- KT0502 Chassis straightening and measuring equipment (includes chassis straitening bench, bench set-up points and sill clamps, jig mounts, electronic body measuring equipment, hydraulic Porte power ram set, hydraulic spreader, power jacks)
- KT0503 Grinding and sanding equipment [includes portable sanding station (random orbital), overhead sanding station, multi-speed electric grinder, laser weld grinder)
- KT0504 Plastic repair tools (includes soldering iron, heater gun)
- KT0505 Shop equipment [includes two post lift, hydraulic lifts, press, welding surge protector (for vehicle electronics), vehicle creeper, headlight adjuster]
- KT0506 Air compressors and accessories, and pneumatic tools (includes rotary screw air compressor, piston air compressor)
- KT0507 OEM specialised tools

Internal Assessment Criteria and Weight

- IAC0501 List and describe hand, power and specialised tools (electrical, hydraulic and pneumatic)
- IAC0502 Identify the various types of equipment (panel beating, chassis straitening, grinding and sanding, plastic repair, shop) and describe their functions and operations
- IAC0503 Identify types of air-compressors and describe their operations
- IAC0504 Explain the safe care, correct usage and storage of tools and equipment
- IAC0505 Explain the importance of correctly selecting and using tools and equipment for the work at hand
- IAC0506 Explain the safety precautions pertaining to tools and equipment

(Weight 5%)

1.2.6. KM-01-KT06: Welding, cutting and brazing (15%)

Topic elements to be covered include:

- KT0601 Gas welding, laser welding, MIG welding, TIG welding, spot welding, cutting, plasma cutting, brazing and MIG brazing equipment, (multi-purpose spot welder and its attachments (spot welder sliding hammer shrinker)
- KT0602 Techniques of welding, cutting and brazing (oxy-acetylene gas welding, MIG-welding/brazing, plasma cutting, spot welding (clamp type), clamp attachment and gun (liquid cooled)
- KT0603 Cutting, welding, MIG brazing and shrinking defects
- KT0604 Flame and pressure settings for welding, cutting, MIG brazing
- KT0605 Colour of the surface as indication of heat/temperature
- KT0606 Gas cylinders, regulators, flash back arrestors, gauges, hoses, torches, nozzles, nozzle cleaner, welding rods, filler metal and fluxes, flashback arrestors
- KT0607 Disposal of scrap material and storage of surplus materials
- KT0608 Health and safety risks and protective equipment and measures

Internal Assessment Criteria and Weight

- IAC0601 Identify and describe laser welding, MIG welding, TIG welding, spot welding, gas welding, cutting (including plasma cutting) and brazing equipment and accessories
- IAC0602 Explain the principles and techniques of MIG welding, TIG welding, laser welding, spot welding, cutting and brazing
- IAC0603 Identify and select the correct material for welding, cutting and brazing according to the intended applications
- IAC0604 Identify and interpret the colour of a heated surface
- IAC0605 Describe cutting, welding and brazing defects and explain why they occur
- IAC0606 Describe ways of disposing scrap material and storage of surplus material
- IAC0607 Explain safety precautions pertaining to welding, cutting and brazing equipment and their respective operations

(Weight 15%)

1.2.7. KM-01-KT07: Dashboards, GPS, navigation and multimedia systems (6%)

Topic elements to be covered include:

- KT0701 Types and components of dashboards
- KT0702 Components of a multi-media system (includes audio systems-radio/tape, CD changers, speakers, car phone/cellular (transmitter, receiver, antenna)

- KT0703 Operation of a multi-media system
- KT0704 Auxiliary equipment components
- KT0705 Original Equipment Manufacturer (OEM) specifications for dashboard components
- KT0706 GPS and navigation systems
- KT0707 Removal and refitting procedures for vehicle dashboard
- KT0708 Removal and refitting procedures for multi-media systems
- KT0709 Removal and refitting procedures for navigation systems
- KT0710 Location and status of supplementary restraint system (SRS)
- KT0711 Safety critical components (limb and life parts)

Internal Assessment Criteria and Weight

- IAC0701 identify and describe types of dashboards, multi-media systems, GPS and navigation systems, their components, and, where applicable, their auxiliary components
- IAC0702 Describe the operations of multi-media, GPS and navigation systems
- IAC0703 Check and confirm OEM specifications for dashboard components
- IAC0704 Describe removal and installation procedures for dashboards and multi-media and navigation systems
- IAC0705 Describe the location and status of SRS systems
- IAC0706 Explain electronic diagrams and symbols

(Weight 6%)

1.2.8. KM-01-KT08: Vehicle trim and moulding (7%)

Topic elements to be covered include:

- KT0801 Types of exterior trim and moulding (bumpers (grill), towbars, roll bars, bull bars, side stepping, winches, spoilers, mirrors, door handles complex beadings, moulds, roof racks/bars, cabriolet retracting roof, rocker panels, fender liners, under-carriage trims, mouldings, door sill beads, body badges, sunroof lid)
- KT0802 Types of interior trim (seats, safety belts, door trim and parts, carpets and underfelt, sound proofing material, rear view mirror, sunroof, roof lining, sun visors, A,B and C post covers, centre console, headliner, instrument cluster, grommets, interior light, grab handles, back board) ST010803 After-market accessories (exterior styling kits)
- KT0803 After-market accessories (exterior styling kits)
- KT0804 Removal and replacement procedures for each type of trim (Procedures include bolt off, clip off, take out, drill out, de-glue, clean, label, bolt on, clip on, glue, rivet)
- KT0805 Air, fume and water leaks
- KT0806 Rattle alignment

- KT0807 Health and safety aspects
- KT0808 Safety critical components (limb and life parts) (OEM specifications)

Internal Assessment Criteria and Weight

- IAC0801 Identify types of exterior and interior trim and describe their functions
- IAC0802 Describe types of after-market accessories
- IAC0803 Describe the removal and refitting procedures for each type of trim
- IAC0804 Explain ways of detecting and repairing water, fume air leaks
- IAC0805 Define rattle alignment and describe ways of detecting and repairing rattles
- IAC0806 Identify and describe tools, equipment and material requirements for repair tasks
- IAC0807 Describe safety requirements when working with trim, moulding and after-market accessories

(Weight 7%)

1.2.9. KM-01-KT09: Vehicle body repair processes (20%)

Topic elements to be covered include:

- KT0901 Ferrous and non-ferrous metal and composite panel repair processes (including body panel substrates)
- KT0902 Techniques for removing body panels (including bolt off, cut off, saw off, chisel off, grind off, drill off) and for using spot weld remover
- KT0903 Techniques for replacing body panels (including weld on, bolt on, rivet on)
- KT0904 Techniques for removing, repairing, refitting and aligning doors, fenders, tailgates/boots, bonnets and roof panels
- KT0905 Door panel (skin) and roof skin replacement processes
- KT0906 Panel adhesive technology
- KT0907 Techniques for aligning body panels
- KT0908 Problems during removal and installation of body panels (manufacturer specifications)
- KT0909 Techniques to prepare body panel surface
- KT0910 Techniques to prepare panels for welding
- KT0911 Surface preparation flaws and imperfections (styling, lines, curves, holes and scratches)
- KT0912 Repair processes for minor dents on ferrous body shell (cleaning, shaping, metal filing, body filling, sanding, stripping, assembling, finishing)
- KT0913 Principles for repairing deformed ferrous metal panels (curing, lead wiping, properties of filling material, dewaxing, corrosion protection)

- KT0914 Repair processes for deformed ferrous metal panels and their advantages and disadvantages (planishing/filing, shrinking, filler application, surface preparation, cutting and welding corroded panels)
- KT0915 Repair processes for non-ferrous metal panels (like aluminium) (panels include fixed panels, de-mountable panels and parts. Repair processes include weld, cut, saw, rivet, planishing/filing, hot and cold shrinking, filler application, surface preparation, finishing off)
- KT0916 Repair processes for different non-metal materials used in automotive components (composites, fibre glass)
- KT0917 Repair processes for paintless dent removal
- KT0918 Types of plastic welding (hot - air, airless, ultrasonic, ultrasonic stud)
- KT0919 Plastic repair techniques (chemical adhesive bonding, reinforced plastic repair)
- KT0920 Removal, replacement and adjustment procedures for automotive door glass
- KT0921 Removal and replacement of bonded glass
- KT0922 Corrosion protection restoration
- KT0923 Body fillers (types and uses)
- KT0924 Sealers and cavity fillers and waxes
- KT0925 Rust damage and anti-rust treatments
- KT0926 Quality control for repair work
- KT0927 Safety procedures pertaining to all repair work

Internal Assessment Criteria and Weight

- IAC0901 Describe the techniques for removing and replacing body panels
- IAC0902 Describe the techniques to remove, repair, refit and align hoods, bumpers, grills, doors, fenders, tailgates/boots, bonnets, front panels and roof panels
- IAC0903 Explain panel adhesive technology
- IAC0904 Describe vehicle body surface preparation techniques
- IAC0905 Describe the techniques to prepare panels for welding and to replace panels using adhesives
- IAC0906 Discuss the various auto body repair processes
- IAC0907 Differentiate between types of body fillers and describe ways of using and applying them
- IAC0908 Describe the method of repairing rust damage
- IAC0909 Explain the application and use of different types of sealers, cavity fillers, cavity waxes and adhesives
- IAC0910 Describe the ways of removing, replacing and adjusting door glass
- IAC0911 Describe the ways of removing and fitting bonded glass

- IAC0912 Describe plastic welding and plastic repair techniques
- IAC0913 Describe rust and anti-rust treatments
- IAC0914 Describe corrosion protection restoration procedures
- IAC0915 Describe door panel (skin) and roof skin replacement processes
- IAC0916 Describe methods for checking the quality of repairs for deformities, deviations, blemishes, curves and contours, lines and surface finish
- IAC0917 Describe methods for disposing of hazardous material
- IAC0918 Explain safety precautions pertaining to all vehicle body repair work

(Weight 20%)

1.2.10. KM-01-KT10: Structural alignment (14%)

Topic elements to be covered include:

- KT1001 Concepts of body alignment (symmetry, pulling and straightening terminology, gauge, control points)
- KT1002 Identifying chassis measuring and straightening equipment (some examples are portable (power dozer). floor-anchoring system, various types of straightening machines)
- KT1003 Straightening and re-aligning techniques (anchoring, blocking, pulling and pushing – direct pulling, vector pulling)
- KT1004 Alignment process (upper body structure, re-aligning the body shell (door with bolted and door with welded hinges), under body structure, re-align frame/chassis (diamond, twist, side way, sag, mash)
- KT1005 Measuring processes (including critical measuring points, 3-D measuring, mechanical measuring, electronic measuring)
- KT1006 Pulling sequence
- KT1007 Safety requirements

Internal Assessment Criteria and Weight

- IAC1001 Discuss concepts related to body alignment
- IAC1002 Describe the different measuring processes
- IAC1003 Identify and describe measuring and straightening equipment
- IAC1004 Describe straightening and re-aligning techniques
- IAC1005 Explain the alignment process
- IAC1006 Explain the pulling sequence
- IAC1007 Explain safety requirements for structural realignment

(Weight 14%)

1.2.11. KM-01-KT11: Paints and primers (3%)

Topic elements to be covered include:

- KT1101 Suppliers manuals and product information brochures
- KT1102 Types of paint and primers and their uses (paints include solids, metallic, water borne, clear coat, hardener, additives, solvents)
- KT1103 Harmful effects of paint and primers
- KT1104 Disposal of hazardous material
- KT1105 Storage and durability

Internal Assessment Criteria and Weight

- IAC1101 Discuss the use and importance of suppliers manuals and product brochures as sources of information on paints and primers
- IAC1102 Describe the types and characteristics and properties of paint and primers
- IAC1103 Describe the methods for disposing of paints, primers and hazardous materials
- IAC1104 Explain the safety requirements to be applied when working with paints, primers and hazardous materials
- IAC1105 Discuss paint storage and durability processes

(Weight 3%)

1.2.12. KM-01-KT12: Masking and demasking (3%)

Topic elements to be covered include:

- KT1201 Scope of masking
- KT1202 Masking materials
- KT1203 Masking and demasking techniques

Internal Assessment Criteria and Weight

- IAC1201 Discuss the scope of masking a vehicle
- IAC1202 Identify masking materials and describe their functions
- IAC1203 Describe masking and demasking techniques
- IAC1204 Explain the safety requirements during the masking process

(Weight 3%)

1.3 Provider Programme Accreditation Criteria

Physical Requirements:

- Resources to deliver the theory
- Access to a training venue

Human Resource Requirements:

- A learner-facilitator ratio of not more than 1:20
- Facilitators must be suitably qualified in the delivery of occupational training programs
- Facilitators must be qualified Panel Beaters with at least 5 years work experience as qualified panel beaters.

Legal Requirements:

- Regulatory occupational health and safety provisions

1.4 Exemptions

- None recognised

2. 684904000-KM-02, Automotive Mechanical Theory , NQF Level 3, Credits 44

2.1 Purpose of the Knowledge Modules

The main focus of the learning in this knowledge module is to build an understanding of discuss the theory related to automotive mechanical aspect of a vehicle. The theory focuses on the principles of operation and the components of the various mechanical systems listed below, the removal and refitting procedures of components and their related safety requirements.

The learning will enable learners to demonstrate an understanding of:

- KM-02-KT01: Fundamentals of engine technology (10%)
- KM-02-KT02: Drive train (10%)
- KM-02-KT03: Cooling system (10%)
- KM-02-KT04: Fuel system (10%)
- KM-02-KT05: Induction system (10%)
- KM-02-KT06: Emissions system (10%)
- KM-02-KT07: Suspension systems (10%)
- KM-02-KT08: Wheel technology and alignment (10%)
- KM-02-KT09: Brake system (10%)
- KM-02-KT10: Automotive climate control (air conditioning) (10%)

2.2 Guidelines for Topics

2.2.1. KM-02-KT01: Fundamentals of engine technology (10%)

Topic elements to be covered include:

- KT0101 Petrol and diesel engines
- KT0102 Principles of operation of the 4 stroke engine
- KT0103 Basic engine configurations (include hybrids and electrical)
- KT0104 Engine bottom end construction (cylinder block, crankshaft, main bearings, crankshaft oil seals, flywheel, connecting rods, connecting rod bearings, pistons, piston pins, piston clearance, piston rings and ring gap)
- KT0105 Engine top end construction (cylinder head, camshaft, intake and exhaust manifolds and the valve cover)
- KT0106 Engine front end construction (camshaft drive, front cover)
- KT0107 Engine design classifications (include cylinder arrangement, number of cylinders, cooling system type, valve location, camshaft location, combustion chamber design and the type of fuel burned)
- KT0108 Engine lubrication
- KT0109 Bearing conditions and failure

- KT0110 Timing

Internal Assessment Criteria and Weight

- IAC0101 Discuss the differences between petrol and diesel engines
- IAC0102 Explain the principles of operation of the 4-stroke engine
- IAC0103 Identify and describe basic engine configurations
- IAC0104 Identify and describe components of the engine bottom, top and front ends
- IAC0105 Explain the differences in engine design
- IAC0106 Explain the principles of engine lubrication
- IAC0107 Identify bearing conditions and give reasons for bearing failure
- IAC0108 Differentiate between mechanical and electrical timing
- IAC0109 Explain the differences between major parts of an engine

(Weight 10%)

2.2.2. KM-02-KT02: Drive train (10%)

Topic elements to be covered include:

- KT0201 Engine
- KT0202 Transmission (manual and automatic)
- KT0203 Differentials
- KT0204 Differential lock (4X4 and 2X4)
- KT0205 Locking differentials (eg. limited slip)
- KT0206 Clutches
- KT0207 Constant Velocity (CV) joints and CV joint boots
- KT0208 Prop or drive shaft
- KT0209 Front wheel drive, rear wheel drive and four-wheel drive
- KT0210 Axles (front and rear)
- KT0211 Torque converters
- KT0212 Drive train component removal and installation procedures
- KT0213 Post-removal and installation procedures
- KT0214 Disposal of hazardous material (oils, coolant, fuels, cleaning agents)
- KT0215 Safety critical components (limb and life parts) (OEM specifications)

Internal Assessment Criteria and Weight

- IAC0201 Identify drive train components and describe their operations
- IAC0202 Discuss the differences between manual, sequential and automatic gearboxes
- IAC0203 Explain the differences between differential locks and locking differentials
- IAC0204 Identify the problems associated with drive train components
- IAC0205 Describe the procedures to remove and replace drive train components
- IAC0206 Describe the techniques for adjusting and bleeding the clutch
- IAC0207 Explain the importance of manufacturer instructions and specifications
- IAC0208 Describe post-removal and installation procedures
- IAC0209 Explain the safety requirements regarding the removal and installation of drive train components

(Weight 10%)

2.2.3. KM-02-KT03: Cooling system (10%)

Topic elements to be covered include:

- KT0301 Principles of heat transfer (conduction, convection and radiation)
- KT0302 Principles of operation of a cooling system
- KT0303 Types of engine cooling systems and their components
- KT0304 Ways of testing the cooling system
- KT0305 Cooling system faults
- KT0306 Removal and replacement techniques for cooling system components
- KT0307 Tools and equipment for testing, removing and replacing cooling system components
- KT0308 Safety requirements when removing and replacing cooling system components
- KT0309 Safety critical components (limb and life parts) (OEM specifications)

Internal Assessment Criteria and Weight

- IAC0301 Explain the principles and process of heat transfer
- IAC0302 Identify and describe the types of engine cooling systems and their components
- IAC0303 Identify the types of thermostats and describe their function
- IAC0304 Describe the roles of coolant and anti-freeze
- IAC0305 Identify and describe the types of radiator fans
- IAC0306 Explain the impact of overheating on the vehicle
- IAC0307 Describe methods of testing the cooling system

- IAC0308 Identify the types of cooling system faults and describe their solutions
- IAC0309 Describe the procedures to remove and replace thermostat, radiator, water pump and hoses
- IAC0310 Describe procedures for flushing the radiator and engine block
- IAC0311 Describe procedures for draining and refilling a fully sealed cooling system
- IAC0312 Explain the safety requirements when repairing cooling system components

(Weight 10%)

2.2.4. KM-02-KT04: Fuel system (10%)

Topic elements to be covered include:

- KT0401 Types of fuel systems (petrol, diesel, hybrid) and their basic operations
- KT0402 Types and functions of fuel system components (fuel tanks and fuel lines)
- KT0403 Fuel injectors and carburettors
- KT0404 Diesel and electric fuel pump
- KT0405 Diesel and petrol injection
- KT0406 Removing and installing fuel tanks
- KT0407 Tools and equipment (including electrical test equipment)
- KT0408 Safety critical components (limb and life parts) (OEM specifications)

Internal Assessment Criteria and Weight

- IAC0401 Identify the types of fuel systems and describe their operations
- IAC0402 Identify fuel system components (fuel tank and fuel lines) and explain their functions
- IAC0403 Explain the operations of fuel injectors, carburettors and diesel and electric fuel pumps
- IAC0404 Explain the difference between diesel and petrol injection
- IAC0405 Describe the procedures for removing and refitting a fuel tank
- IAC0406 Explain the safety requirements when removing and refitting fuel tanks

(Weight 10%)

2.2.5. KM-02-KT05: Induction system (10%)

Topic elements to be covered include:

- KT0501 Components of an induction system
- KT0502 Purpose of an induction system

- KT0503 Turbos and superchargers
- KT0504 Intercoolers
- KT0505 Safety requirements
- KT0506 Safety critical components (limb and life parts) (OEM specifications)

Internal Assessment Criteria and Weight

- IAC0501 Explain the purposes of an induction system
- IAC0502 Identify the components of an induction system and describe their functions
- IAC0503 Describe turbos, superchargers and intercoolers in terms of their functions

(Weight 10%)

2.2.6. KM-02-KT06: Emissions system (10%)

Topic elements to be covered include:

- KT0601 Emission systems
- KT0602 Emission control standards
- KT0603 Impact on environment
- KT0604 Safety critical components (limb and life parts) (OEM specifications)

Internal Assessment Criteria and Weight

- IAC0601 Discuss the purpose of the emissions system
- IAC0602 Identify and describe the components of an emissions system
- IAC0603 Explain the interaction between the induction and emission systems
- IAC0604 Discuss emission control standards and the impact of emission on the environment
- IAC0605 Explain the safety requirements pertaining to emission systems

(Weight 10%)

2.2.7. KM-02-KT07: Suspension systems (10%)

Topic elements to be covered include:

- KT0701 Principles of hydraulics and pneumatics
- KT0702 Suspension systems (independent, non-independent, hydraulic, wishbone, multi-link, trailing-arm, I-beam, solid-axle, leaf spring, coil spring, beam axle, 4-Bar suspension, transverse leaf-spring, moulton rubber, self-levelling air/hydraulic suspension, variations of control blade)
- KT0703 Springs
- KT0704 Shock absorbers

- KT0705 Struts (including the MacPherson strut)
- KT0706 Steering designs (rack and pinion, variable-ratio rack and pinion steering, power rack and pinion, recirculating-ball, hydraulic power steering, electro-hydraulic steering systems, electric systems, drive-by-wire, rear wheel and four-wheel steering)
- KT0707 Techniques for checking the front and rear suspensions
- KT0708 Techniques for removing, replacing or renewing suspension, under-carriage components and under-carriage trim
- KT0709 Safety critical components (limb and life parts) (OEM specifications)

Internal Assessment Criteria and Weight

- IAC0701 Discuss the basic principles of hydraulics and pneumatics
- IAC0702 Describe the different types of suspension systems
- IAC0703 Identify and describe the components of an independent suspension
- IAC0704 Describe the types and operations of shock absorbers
- IAC0705 Describe the types of steering designs
- IAC0706 Describe the techniques for checking the front and rear suspensions
- IAC0707 The techniques for removing and refitting front and rear shock absorbers
- IAC0708 The techniques for removing and refitting the MacPherson strut, coil springs, anti-roll bar bushes and steering rack gaiters
- IAC0709 Describe the techniques for checking, removing and refitting rack and steering pinion unit
- IAC0710 Describe the techniques for removing and refitting track rod and track-rod-end ball joints
- IAC0711 Describe the technique for checking and adjusting the steering box
- IAC0712 Describe the techniques for removing and refitting under-carriage components and trim
- IAC0713 Explain the safety aspects when removing and refitting suspension system components

(Weight 10%)

2.2.8. KM-02-KT08: Wheel technology and alignment (10%)

Topic elements to be covered include:

- KT0801 Wheel alignment and its terminology [toe-in caster, camber, steering axis (king-pin) inclination, turning radius, wheel balance, static balance, dynamic balance, toe-in and toe-out, kerbweight]
- KT0802 Relationship between suspension and wheel alignment
- KT0803 Road holding behaviour
- KT0804 Types of automotive tyres (include run flat technology)

- KT0805 Properties and characteristics of automotive tyres (correct measurement of tyre tread, side walls, tyre specifications, speed and weight rating, tread wear, tyre pressure)
- KT0806 Types of rims (magnesium, composite steel, carbon fibre)
- KT0807 Wheel balancing
- KT0808 Techniques to remove and refit automotive wheel
- KT0809 Wheel diagnostics (rim analysis, tyre wear pattern analysis, tyre pressuring monitoring systems)
- KT0810 Safety requirements
- KT0811 Safety critical components (limb and life parts) (OEM specifications)

Internal Assessment Criteria and Weight

- IAC0801 Explain the concept wheel alignment and its related terminology
- IAC0802 Explain the method for performing wheel alignment
- IAC0803 Explain how a wheel alignment report is interpreted
- IAC0804 Discuss types of automotive tyres, their properties and characteristics and types of rims
- IAC0805 Explain the concept of run flat technology
- IAC0806 Discuss the process and importance of wheel balancing
- IAC0807 Explain the concept of wheel diagnostics
- IAC0808 Describe the types of wheel repairs (tyre and rim)
- IAC0809 Describe the techniques to remove and refit automotive tyres
- IAC0810 Describe the safe use of wheel alignment equipment
- IAC0811 Describe the safety requirements for performing wheel alignment and wheel repairs

(Weight 10%)

2.2.9. KM-02-KT09: Brake system (10%)

Topic elements to be covered include:

- KT0901 Braking systems (hydraulic/pneumatic) and handbrake system (including electric park brake)
- KT0902 Brake master cylinder and booster
- KT0903 Drum brake assembly
- KT0904 Disc brakes
- KT0905 Anti-lock Brake System (ABS)
- KT0906 Operations to remove and refit brake components

- KT0907 Safety requirements when working with brake system
- KT0908 Safety critical components (limb and life parts) (OEM specifications)

Internal Assessment Criteria and Weight

- IAC0901 Identify and describe types of brakes
- IAC0902 Describe the operations of brake systems (hydraulic and pneumatic)
- IAC0903 Describe the master cylinder and servo unit
- IAC0904 Identify the components of a drum brake and a disc brake and describe their functions
- IAC0905 Describe problems with brake systems
- IAC0906 Describe procedures to remove and refit brake components
- IAC0907 Describe brake bleeding procedures
- IAC0908 Explain safety requirements when working with brake systems

(Weight 10%)

2.2.10. KM-02-KT10: Automotive climate control (air conditioning) (10%)

Topic elements to be covered include:

- KT1001 Principles of heat transfer
- KT1002 Operation of the air conditioner
- KT1003 Components of air conditioning system (magnetic clutch, condenser, receiver-dryer, expansion valve, evaporator, blower (auxiliary and main), refrigerant, controls, pressure switch (high and low, demister unit)
- KT1004 Types of compressor (axial type, scroll type, vane type, electric type)
- KT1005 Evacuation and re-gassing
- KT1006 Air-conditioning problems
- KT1007 Hazardous materials (refrigerant and types of lubricants)
- KT1008 Safety procedures

Internal Assessment Criteria and Weight

- IAC1001 Discuss heat transfer principles
- IAC1002 Explain the function and operating principles of automotive air conditioners
- IAC1003 Explain the principles of the refrigeration cycle
- IAC1004 Identify the components of the automotive air-conditioning system and describe their functions
- IAC1005 Identify common problems with the automotive air-conditioning system

- IAC1006 Describe evacuation and re-gassing procedures
- IAC1007 Describe disposal procedures for hazardous materials
- IAC1008 Identify and describe types of air-conditioner compressors
- IAC1009 Explain the safety requirements pertaining to automotive air-conditioning systems

(Weight 10%)

2.3 Provider Programme Accreditation Criteria

Physical Requirements:

- Resources to deliver the theory
- Access to a training venue

Human Resource Requirements:

- A learner-facilitator ratio of not more than 1:20
- Facilitators must be suitably qualified in the delivery of occupational training programs
- Facilitators must be qualified Panel Beaters with at least 5 years work experience as qualified panel beaters.

Legal Requirements:

- Regulatory occupational health and safety provisions

2.4 Exemptions

- None recognised

3. 684904000-KM-03, Auto-electrical Theory, NQF Level 3, Credits 44

3.1 Purpose of the Knowledge Modules

The main focus of the learning in this knowledge module is to build an understanding of cover the removal and refitting procedures for the components of various auto-electrical systems and their related safety requirements. The theory also focuses on fault-finding on an auto-electrical system using both a diagnostic tool and a multimeter.

The learning will enable learners to demonstrate an understanding of:

- KM-03-KT01: Battery (5%)
- KM-03-KT02: Wiring Harnesses, bus systems, control units and antennas (6%)
- KM-03-KT03: Supplementary restraint systems (SRS) (19%)
- KM-03-KT04: Vehicle lights (5%)
- KM-03-KT05: Electric windows (5%)
- KM-03-KT06: Fuse box (5%)
- KM-03-KT07: Vehicle sensor and camera technology (11%)
- KM-03-KT08: Vehicle hybrid system (12%)
- KM-03-KT09: Electric vehicles (7%)
- KM-03-KT10: Main auto-electrical systems (10%)
- KM-03-KT11: Central locking system (5%)
- KM-03-KT12: Vehicle diagnostics (5%)
- KM-03-KT13: Fault finding using a multi-meter (5%)

3.2 Guidelines for Topics

3.2.1. KM-03-KT01: Battery (5%)

Topic elements to be covered include:

- KT0101 Principles of auto-electricity
- KT0102 Types of batteries [conventional lead acid, maintenance free-sealed, Absorbed Glass-fibre matt (AGM), Gel/basic Hybrid types, and Fleece battery]
- KT0103 Battery operation
- KT0104 Procedures to check the battery and battery cables
- KT0105 Battery tests (voltage test, check water level, sulphation test)
- KT0106 Procedures to remove and refit batteries
- KT0107 Jump starting procedures
- KT0108 Battery health

- KT0109 Tools and equipment

Internal Assessment Criteria and Weight

- IAC0101 Explain the principles of auto-electricity
- IAC0102 Explain the basics of electricity and electronics
- IAC0103 Identify and describe the types of batteries
- IAC0104 Explain the functions of batteries
- IAC0105 Describe the procedures to maintain battery health and to check battery cables
- IAC0106 Describe the procedures to remove and refit batteries
- IAC0107 describe the procedures to jump start vehicles
- IAC0108 Describe the procedures to conduct battery tests
- IAC0109 Describe the procedures for disposing batteries
- IAC0110 Explain the safety procedures when working with batteries and battery cables

(Weight 5%)

3.2.2. KM-03-KT02: Wiring Harnesses, bus systems, control units and antennas (6%)

Topic elements to be covered include:

- KT0201 Types and components of wiring harnesses (Includes conductors, insulators, connectors (key-way, non-symmetrical), terminals, sleeves (shrink, harness wraps, loom tape), straps, clips and fasteners)
- KT0202 Types and components of antennas
- KT0203 Components of a bus systems
- KT0204 Control units
- KT0205 Electrostatic discharge
- KT0206 Removal and replacement procedures for sectional wiring harness, control units and antennas
- KT0207 Tools and equipment
- KT0208 Safety requirements

Internal Assessment Criteria and Weight

- IAC0201 Identify and describe types of wiring harnesses
- IAC0202 Identify components of a wiring harness
- IAC0203 Identify components of a bus system and describe the operation of a bus system
- IAC0204 Describe the functions of a control unit

- IAC0205 Identify and describe types of antennas
- IAC0206 Describe procedures to remove and refit sectional wiring harnesses
- IAC0207 Describe procedures to remove and refit antennas and control units
- IAC0208 Identify tools and equipment used to work on wiring harnesses and antennas
- IAC0209 Discuss the impact of electrostatic discharge
- IAC0210 Explain safety requirements when working with wiring harnesses

(Weight 6%)

3.2.3. KM-03-KT03: Supplementary restraint systems (SRS) (19%)

Topic elements to be covered include:

- KT0301 Types of seat belt systems (reversible emergency tensioning retractor, retracted pyrotechnic, seatbelt stalk)
- KT0302 Components of supplementary restraint safety systems [airbags (driver, passenger, side, curtain, knee) seat belts, roll-over bar, head rest restraints]
- KT0303 Removal and replacement procedures for passive safety systems
- KT0304 Safety requirements

Internal Assessment Criteria and Weight

- IAC0301 Identify and describe the types, functions and components of supplementary restraint systems
- IAC0302 Explain the operations of seat belt systems
- IAC0303 Describe procedures to remove and refit supplementary restraint systems
- IAC0304 Explain the safety requirements for SR systems
- IAC0305 Discuss the importance of manufacturer specifications for SR systems

(Weight 19%)

3.2.4. KM-03-KT04: Vehicle lights (5%)

Topic elements to be covered include:

- KT0401 Lights (includes headlights, indicator lights, reverse lights, tail lights, Xenon lights, LED lights, projector lights, fog lights, vehicle interior lights)
- KT0402 Removal, fitting and adjusting procedures for vehicle lights
- KT0403 Safety requirements

Internal Assessment Criteria and Weight

- IAC0401 Identify and describe types of lights

- IAC0402 Describe the removal, fitting and adjusting procedures for vehicle lights
- IAC0403 Explain safety requirements when working on vehicle lights

(Weight 5%)

3.2.5. KM-03-KT05: Electric windows (5%)

Topic elements to be covered include:

- KT0501 Components of electric windows
- KT0502 Removal, fitting and adjusting procedures for electric windows
- KT0503 Safety requirements

Internal Assessment Criteria and Weight

- IAC0501 Identify and describe components of electric windows
- IAC0502 Describe procedures to remove, refit and adjust electrical windows
- IAC0503 Explain safety requirements when working on electrical windows

(Weight 5%)

3.2.6. KM-03-KT06: Fuse box (5%)

Topic elements to be covered include:

- KT0601 Components of a fuse box
- KT0602 Safety requirements

Internal Assessment Criteria and Weight

- IAC0601 Identify and describe components of a fuse box
- IAC0602 Explain safety requirements pertaining to a vehicle fuse box

(Weight 5%)

3.2.7. KM-03-KT07: Vehicle sensor and camera technology (11%)

Topic elements to be covered include:

- KT0701 Sensor and camera technology
- KT0702 Types of sensors (rain and light, park distance control)
- KT0703 Cameras and their locations
- KT0704 Functions of cameras
- KT0705 Removal and fitting of sensors and cameras

- KT0706 Safety requirements

Internal Assessment Criteria and Weight

- IAC0701 Explain the principles of sensor and camera technology
- IAC0702 Discuss the main sensors (distance sensor, radar) , their locations and functions
- IAC0703 Discuss cameras, their locations and functions
- IAC0704 Describe the procedures to remove and refit sensors and cameras
- IAC0705 Discuss the sensitivity of cameras to misalignment
- IAC0706 Discuss the calibration of cameras
- IAC0707 Explain safety requirements when working with vehicle sensors and cameras

(Weight 11%)

3.2.8. KM-03-KT08: Vehicle hybrid system (12%)

Topic elements to be covered include:

- KT0801 The hybrid concept
- KT0802 Components of vehicle hybrid system
- KT0803 Types of hybrid systems
- KT0804 Construction and operation of vehicle hybrid system
- KT0805 Safety requirements

Internal Assessment Criteria and Weight

- IAC0801 Discuss the concept of a hybrid system
- IAC0802 Identify and describe the major components and types of vehicle hybrid systems
- IAC0803 Discuss the construction and operation of vehicle hybrid systems
- IAC0804 Explain safety requirements when working on a high-voltage hybrid system

(Weight 12%)

3.2.9. KM-03-KT09: Electric vehicles (7%)

Topic elements to be covered include:

- KT0901 Components of electric vehicles
- KT0902 Construction and operation of electric vehicles
- KT0903 Safety requirements

Internal Assessment Criteria and Weight

- IAC0901 The major components of vehicle electrical drive systems are identified and described
- IAC0902 The construction and operation of electric vehicles are discussed
- IAC0903 Safety requirements when working on electric vehicles are discussed

(Weight 7%)

3.2.10. KM-03-KT10: Main auto-electrical systems (10%)

Topic elements to be covered include:

- KT1001 Components of the charging system [Battery, alternator (internal and external types), relay, rectifier, indicator, ignition switch, fuses, fusible links, brushes, field control, belts (V-belt, ribbed V-belt), battery cables, mountings, fusible links, circuit protection devices, warning lights, drive ratio]
- KT1002 Components of the starting system [Starter motors, solenoids, ignition switch, flywheel ring gear, armature, field (electromagnetic/permanent magnet), brushes, bushes, bendix drives, brush gears, end casings (brackets), starting cables and wires, neutral park switch, starter relay, body solenoids.]
- KT1003 Components of the ignition systems [Include battery, low-tension cables, ignition coil, distributor (break points and condenser), coil high-tension cable, spark plug cables and spark plugs, glow plugs, ballast resistor, centrifugal advance, vacuum advance mechanism, ignition switch, ECU.]
- KT1004 Principles of operations of the charging system (electromagnetic induction, rectification, single phase and three phase), starting and ignition (petrol and diesel) systems
- KT1005 Types of starter motors, including hybrids (conventional drive, pre-engaged, cyclic gear, axial inertia)]
- KT1006 Safety requirements

Internal Assessment Criteria and Weight

- IAC1001 Identify the components of the charging system and describe their functions
- IAC1002 Identify the components of the starting system and describe their functions
- IAC1003 Identify the components of the petrol and diesel ignition systems and describe their functions
- IAC1004 Explain the principles of operation of a charging system, ignition system (high and low tension circuits) and starting system (petrol and diesel)
- IAC1005 Explain the way a starter motor works, using a diagram
- IAC1008 Discuss the types of starter motors
- IAC1009 Explain safety requirements when working with charging, starting and ignition systems

(Weight 10%)

3.2.11. KM-03-KT11: Central locking system (5%)

Topic elements to be covered include:

- KT1101 Central locking systems
- KT1102 Removal and refitting procedures for central locking system
- KT1103 Safety requirements

Internal Assessment Criteria and Weight

- IAC1101 Identify and describe the components of vehicle central locking system
- IAC1102 Explain the operation of the central locking system
- IAC1103 Describe procedures to remove and refit for central locking systems
- IAC1104 Explain safety requirements when working on central locking systems

(Weight 5%)

3.2.12. KM-03-KT12: Vehicle diagnostics (5%)

Topic elements to be covered include:

- KT1201 Vehicle diagnostics
- KT1202 Vehicle diagnostic tool and software
- KT1203 Safety requirements

Internal Assessment Criteria and Weight

- IAC1201 Discuss the concept of vehicle diagnostics
- IAC1202 Discuss vehicle diagnostic tool, equipment and its related software
- IAC1203 Discuss the ways of connecting a diagnostic tool and using it
- IAC1204 Discuss methods of interpreting vehicle diagnostics print outs before and after repairs
- IAC1205 Explain safety requirements pertaining to using vehicle diagnostic equipment

(Weight 5%)

3.2.13. KM-03-KT13: Fault finding using a multi-meter (5%)

Topic elements to be covered include:

- KT1301 Types of faults (continuity, resistance, current draw from fault finding point of view, loose wires, fuses)
- KT1302 Use of a multi-meter
- KT1303 Safety requirements

Internal Assessment Criteria and Weight

- IAC1301 Describe the types of auto-electrical faults

- IAC1302 State the reasons for and ways of using a multi-meter
- IAC1303 Explain safety requirements pertaining to using a multi-meter

(Weight 5%)

3.3 Provider Programme Accreditation Criteria

Physical Requirements:

- Resources to deliver the theory
- Access to a training venue

Human Resource Requirements:

- A learner-facilitator ratio of not more than 1:20
- Facilitators must be suitably qualified in the delivery of occupational training programs
- Facilitators must be qualified Panel Beaters with at least 5 years work experience as qualified auto-electricians.

Legal Requirements:

- Regulatory occupational health and safety provisions

3.4 Exemptions

- None recognised

4. 684904000-KM-04, Analysis of damage, NQF Level 4, Credits 18

4.1 Purpose of the Knowledge Modules

The main focus of the learning in this knowledge module is to build an understanding of to assessment of vehicle damage. The learner will use the theory acquired to assess vehicle damage against job card.

The learning will enable learners to demonstrate an understanding of:

- KM-04-KT01: Automotive industry (20%)
- KM-04-KT02: Automotive vehicle damage (50%)
- KM-04-KT03: Vehicle damage analysis procedure (30%)

4.2 Guidelines for Topics

4.2.1. KM-04-KT01: Automotive industry (20%)

Topic elements to be covered include:

- KT0101 Global and local car manufacturers
- KT0102 Local retail motor business (new cars, used vehicles, custom-built cars, imported, stolen vehicles)
- KT0103 After-market providers
- KT0104 Vehicle manuals
- KT0105 Original Equipment Manufacturer (OEM)
- KT0106 Repair industry structures
- KT0107 Automotive industry standards
- KT0108 Regulatory bodies in the automotive industry

Internal Assessment Criteria and Weight

- IAC0101 Describe the global and local car manufacturing industry
- IAC0102 Explain the concept of after-market providers
- IAC0103 Explain the importance and use of vehicle manuals
- IAC0104 Discuss OEM parts, requirements and warranty
- IAC0105 Describe the roles and responsibilities of repair industry structures, regulatory bodies and insurance agencies
- IAC0106 Identify and explain automotive industry standards

(Weight 20%)

4.2.2. KM-04-KT02: Automotive vehicle damage (50%)

Topic elements to be covered include:

- KT0201 Damage assessment procedures (direct or primary damage, indirect or secondary damage, visible damage, concealed damage, direction of damage)
- KT0202 Methods of describing major damage (parallel side damage, direct side damage, front end damage, three quarter frontal damage, rear end damage, roll over damage, total write off)
- KT0203 Types of damage [metal damages include kinks and bends, frame (chassis) damage includes diamond, sag, mash, twist, side sway]
- KT0204 Energy transfer in a collision
- KT0205 Rattle alignment
- KT0206 Reference elements of damage analysis (centre-line, level, datum, cross measurements)
- KT0207 Sequence for gauging damage
- KT0208 Gauging and analysing frame/chassis damage
- KT0209 Measuring processes (including critical measuring points, 3-D measuring, mechanical measuring, electronic measuring)

Internal Assessment Criteria and Weight

- IAC0201 Describe damage assessment procedures
- IAC0202 Explain methods of describing major damage
- IAC0203 Identify and describe types of damage
- IAC0204 Explain reference elements of damage analysis
- IAC0205 Check condition of trim and determine the extent of damage and scope of repair according to quantification procedures
- IAC0206 Identify rattles and describe ways of repairing them
- IAC0207 Explain measuring processes

(Weight 50%)

4.2.3. KM-04-KT03: Vehicle damage analysis procedure (30%)

Topic elements to be covered include:

- KT0301 Sequence for evaluating vehicle damage (damage verification (including unseen damage))
- KT0302 Extent of repairability
- KT0303 Repair procedures/processes
- KT0304 Repair duration (key to key times, overlap times)
- KT0305 Report preparation

Internal Assessment Criteria and Weight

- IAC0301 Describe the sequence for analysing damage in terms of the job card

- IAC0302 Describe seen and unseen damage identification procedures
- IAC0303 Describe method to determine extent of repair
- IAC0304 Describe method of determining whether part should be repaired or replaced
- IAC0305 Explain how to determine the duration of the repair
- IAC0306 Submit a verbal or oral report to management/supervisor in case of discrepancy between the job card and the panel beater

(Weight 30%)

4.3 Provider Programme Accreditation Criteria

Physical Requirements:

- Resources to deliver the theory
- Access to a training venue

Human Resource Requirements:

- A learner-facilitator ratio of not more than 1:20
- Facilitators must be suitably qualified in the delivery of occupational training programs
- Facilitators must be qualified Panel Beaters with at least 5 years work experience as qualified panel beaters.

Legal Requirements:

- Regulatory occupational health and safety provisions

4.4 Exemptions

- None recognised

SECTION 3B: PRACTICAL SKILL MODULE SPECIFICATIONS

List of Practical Skill Module Specifications

- 684904000-PM-01, Remove and refit automotive body components , NQF Level 3, Credits 20
- 684904000-PM-02, Perform basic repairs to vehicle body, NQF Level 3, Credits 76
- 684904000-PM-03, Perform advanced repairs to vehicle body and structure, NQF Level 4, Credits 60
- 684904000-PM-04, Remove and refit vehicle mechanical components and perform wheel alignment, NQF Level 4, Credits 30
- 684904000-PM-05, Remove and replace auto-electrical components and perform diagnostics, NQF Level 3, Credits 26
- 684904000-PM-06, Analyse damage in terms of the job card and report to supervisor, NQF Level 4, Credits 40

1. 684904000-PM-01, Remove and refit automotive body components , NQF Level 3, Credits 20

1.1 Purpose of the Practical Skill Modules

The focus of the learning in this module is on providing the learner an opportunity to develop the skills to remove and refit and align dashboards, navigation display screens and multimedia systems,, automotive interior and exterior trim and moulding. In addition, the learner will learn how to remove and refit bonded glass. The learner will also learn to use manufacturer instruction manuals and a variety of hand, power and specialised tools and equipment.

The learner will be required to:

- PM-01-PS01: Select and care for hand, power and specialised tools
- PM-01-PS02: Remove and refit a dashboard, navigation/ display screen and multi media system
- PM-01-PS03: Remove and replace interior trim
- PM-01-PS04: Remove and replace exterior trim and moulding
- PM-01-PS05: Remove and refit automotive bonded glass

1.2 Guidelines for Practical Skills

1.2.1. PM-01-PS01: Select and care for hand, power and specialised tools

Scope of Practical Skill

Given an assignment to perform any auto-body-related activity the learner must be able to:

- PA0101 Identify and select the different tools required
- PA0102 Demonstrate the use of the different tools
- PA0103 Demonstrate cleaning and storing practices for different tools
- PA0104 Identify potential hazards and risks related to the use of the tools and list appropriate response

Applied Knowledge

- AK0101 Identification, function, use and care of hand, power and specialised tools
- AK0102 Practices related to quality, health, safety, and protection of the environment when using hand tools

Internal Assessment Criteria

- IAC0101 Hand, power and specialised tools are identified and selected for a specific application
- IAC0102 Hand, power and specialised tools are used safely and properly
- IAC0103 Hand, power and specialised tools are cleaned and stored correctly
- IAC0104 Hazards associated with the tools are identified and avoided

1.2.2. PM-01-PS02: Remove and refit a dashboard, navigation/ display screen and multi media system

Scope of Practical Skill

Given appropriate tools and an assignment to remove and refit a dashboard, navigation/display screen and multi-media system the learner must be able to:

- PA0201 Record vehicle details, related parts, instrumentation and multi-media and security systems
- PA0202 Prepare the vehicle for the removal of a dashboard, navigation/display screen and multi-media system
- PA0203 Remove, refit and align dashboard navigation/display screen and multi-media system using manufacturer's instructions and sequence
- PA0204 Identify potential hazards and risks related to the removal and refitting of a dashboard navigation/display screen and multi-media system
- PA0205 Demonstrate adherence to health and safety requirements during removal and refit of dashboard

Applied Knowledge

- AK0201 Types of dashboard navigation/display screen and multi-media system
- AK0202 Procedures for removing, refitting and aligning different dashboards navigation/display screen and multi-media system
- AK0203 Identification, function, use of and care for hand and specialised tools used in removing and refitting dashboards navigation/display screen and multi-media system
- AK0204 Location of supplementary restraint systems, instrumentation, multi-media and security systems
- AK0205 Practices related to quality, health, safety, and protection of the environment when removing and refitting dashboards navigation/display screen and multi-media system

Internal Assessment Criteria

- IAC0201 Different hand tools required for removing and refitting a dashboard navigation/display screen and multi-media system are described and used
- IAC0202 Vehicle is prepared for dashboard navigation/display screen and multi-media system removal according to manufacturer's instructions
- IAC0203 Location of supplementary restraint systems is correctly identified
- IAC0204 Vehicle dashboard navigation/display screen and multi-media system are removed, refitted and aligned using manufacturer's instructions
- IAC0205 Post-operational procedures are performed
- IAC0206 Functionality of refitted dashboard navigation/display screen and multi-media system is checked and faults rectified
- IAC0207 Safety requirements pertaining to the removal and refitting of a dashboard navigation/display screen and multi-media system are applied

1.2.3. PM-01-PS03: Remove and replace interior trim

Scope of Practical Skill

Given a range of tools and assignments to remove and replace vehicle interior trim the learner must be able to:

- PA0301 Select the appropriate tools and equipment required for the removal and replacement of different types of interior trim
- PA0302 Prepare the vehicle for removal of interior trim
- PA0303 Remove, refit and align interior trim using manufacturer's instructions and sequence
- PA0304 Remove, refit and align interior trim using manufacturer's instructions and sequence
- PA0305 Label removed parts, trim and wires
- PA0306 Demonstrate adherence to safe and environmentally responsible practices during all the stages of the assignment

Applied Knowledge

- AK0301 Removal and refitting procedures for interior trim (Interior trim includes grommets, carpets, seats, roof lining, interior light, sun visors, rear view mirror, grab handles, A,B,C post trim covers, centre console, back board, safety belts, underfelt, sound proofing material, sun visors, A,B and C post covers, headliner, instrument cluster)
- AK0302 Identification, function, use of and care for tools to remove and refit interior trim
- AK0303 Methods to remove trim (bolt off, clip off, take out, drill out, de-glue, clean, label)
- AK0304 Methods to refit trim (bolt on, clip on, glue, rivet)
- AK0305 Practices related to quality, health, safety, and protection of the environment when removing and refitting interior trim

Internal Assessment Criteria

- IAC0301 Different hand tools required for removing and refitting internal trim are identified and used
- IAC0302 Vehicle is prepared for trim removal according to manufacturer's instructions
- IAC0303 Vehicle interior trims are removed, refitted and aligned using manufacturer's instructions
- IAC0304 Post-operational procedures are performed
- IAC0305 Safety requirements pertaining to the removal and refitting of interior trim are applied

1.2.4. PM-01-PS04: Remove and replace exterior trim and moulding

Scope of Practical Skill

Given a range of tools and assignments to remove and replace vehicle exterior trim and moulding the learner must be able to:

- PA0401 Select the appropriate tools and equipment required for the removal and replacement of different types of exterior trim and moulding
- PA0402 Prepare the vehicle for removal of exterior trim and moulding

- PA0403 Remove, refit and align exterior trim and moulding using manufacturer's instructions and sequence
- PA0404 Label removed parts, trim and wires
- PA0405 Identify potential hazards and risks related to the removal and refitting of vehicle exterior trim and moulding
- PA0406 Demonstrate adherence to safe and environmentally responsible practices during removal and refitting of vehicle exterior trim and moulding

Applied Knowledge

- AK0401 Removal and refit procedures for exterior trim (exterior trim includes bumpers (grill), towbars, roll bars, bull bars, side stepping, winches spoilers, mirrors, door handles, complex beadings, moulds, roof racks/bars, fender liners, under-carriage trim, mouldings, door sill beads, body badges)
- AK0402 Identification, function, use of and care for tools to remove and refit exterior trim and moulding
- AK0403 Methods to remove trim (bolt off, clip off, take out, drill out, de-glue, clean, label)
- AK0404 Methods to refit trim (bolt on, clip on, glue, rivet)
- AK0405 Practices related to quality, health and safety when removing and refitting exterior trim and moulding

Internal Assessment Criteria

- IAC0401 Different hand tools required for removing and refitting exterior trim and moulding are identified and used
- IAC0402 Vehicle is prepared for trim removal according to manufacturer's instructions
- IAC0403 Vehicle exterior trims are removed, refitted and aligned using manufacturer's instructions
- IAC0404 Post-operational procedures are performed
- IAC0405 Safety requirements pertaining to the removal and refitting of exterior trim and moulding are applied

1.2.5. PM-01-PS05: Remove and refit automotive bonded glass

Scope of Practical Skill

Given tools and equipment and assignments to remove and refit automotive bonded glass the learner must be able to:

- PA0501 Select the tools and equipment required for the assignment
- PA0502 Prepare the vehicle for removing automotive bonded glass
- PA0503 Remove and refit automotive bonded glass
- PA0504 Identify, remove and refit components related to removal of bonded glass (camera, rain sensors, antenna, demister)

- PA0505 Identify potential hazards and risks related to removing of automotive bonded glass
- PA0506 Demonstrate adherence to safe and environmentally responsible practices during removal of automotive bonded glass

Applied Knowledge

- AK0501 Automotive bonded glass (front screen, rear screen and glass bonded to doors and quarter sections)
- AK0502 Tools and equipment for removing bonded glass
- AK0503 Methods to remove automotive bonded glass
- AK0504 Camera, rain sensors, antenna, demister
- AK0505 Practices related to quality, health, safety, and protection of the environment when removing and refitting automotive bonded glass

Internal Assessment Criteria

- IAC0501 Different tools required for removing and refitting automotive bonded glass are identified and used
- IAC0502 Vehicle is prepared for removing and refitting bonded glass according to manufacturer's instructions
- IAC0503 Vehicle bonded glass is removed and refitted using OEM instructions
- IAC0504 Post-operational procedures are performed
- IAC0505 Safety requirements for removal of bonded glass are applied

1.3 Provider Programme Accreditation Criteria

Physical Requirements:

- Tools and equipment
- Vehicles for demonstration purposes, with relevant technology to perform the tasks
- Facility to provide training
- Original Equipment Manufacturer manuals and specifications relevant to the demonstration vehicle

Human Resource Requirements:

- Qualified Panel Beater with 5 years' experience in the trade for every 10 learners.
- Recognised training in facilitation
- Recognised training in assessment

Legal Requirements:

- Compliance to the relevant occupational health, safety and environmental protection legislation.

1.4 Exemptions

- None

2. 684904000-PM-02, Perform basic repairs to vehicle body, NQF Level 3, Credits 76

2.1 Purpose of the Practical Skill Modules

The focus of the learning in this module is on providing the learner an opportunity to use a range of auto-body repair skills (including welding, cutting and brazing) to perform automotive body repairs in a controlled learning environment. In addition, the learner will be able to repair non-ferrous metal body bolt on panels and non-metal components.

The learner will be required to:

- PM-02-PS01: Weld, cut and braze
- PM-02-PS02: Repair minor dents
- PM-02-PS03: Remove dents without painting them (PDR)
- PM-02-PS04: Remove, replace and align bolt on body panels
- PM-02-PS05: Remove, strip, repair, reassemble, replace and align door panels
- PM-02-PS06: Repair deformed ferrous metal panels
- PM-02-PS07: Prepare body surface for painting
- PM-02-PS08: Repair non-ferrous metal body bolt on panels
- PM-02-PS09: Repair non-metal components

2.2 Guidelines for Practical Skills

2.2.1. PM-02-PS01: Weld, cut and braze

Scope of Practical Skill

Given welding, cutting and brazing tools and equipment, materials and instructions the learner must be able to:

- PA0101 Identify the work to be done
- PA0102 Select and set-up welding, cutting and brazing machines
- PA0103 Prepare vehicle for welding, cutting and brazing
- PA0104 Weld, cut and braze parts of vehicle according to procedure
- PA0105 Identify defects related to work performed
- PA0106 Use welding, cutting and brazing machines in a safe and responsible manner
- PA0107 Conduct post welding, cutting and brazing activities

Applied Knowledge

- AK0101 Identification, function, use of and care of welding, cutting and brazing equipment
- AK0102 Types of welding: gas welding, laser welding, manual inert gas (MIG), tungsten inert gas (TIG), spot welding
- AK0103 Types of cutting (plasma, air saw, chisel)

- AK0104 Procedures to weld, cut and braze vehicle using appropriate equipment
- AK0105 Flame and pressure settings
- AK0106 Welding safety colour markings and symbols
- AK0107 Welding, cutting and brazing safety precautions

Internal Assessment Criteria

- IAC0101 The uses of welding, cutting and brazing equipment are explained and demonstrated
- IAC0102 The vehicle is prepared for welding, cutting and brazing activities
- IAC0103 The vehicle parts/components/panels are welded, cut and brazed according to procedure and specifications
- IAC0104 Safety precautions are applied when welding, cutting and brazing
- IAC0105 Risks and hazards are identified and responded to in a responsible manner

2.2.2. PM-02-PS02: Repair minor dents

Scope of Practical Skill

Given a range of power tools and equipment and assignments to repair minor dents the learner must be able to:

- PA0201 Identify and select the different tools and panel beating equipment
- PA0202 Determine the repair procedure
- PA0203 Prepare the vehicle for dent repair
- PA0204 Consult manufacturer's manuals
- PA0205 Repair minor dents
- PA0206 Perform quality evaluation on repairs
- PA0207 Identify potential hazards and risks related to the use of the tools, equipment and respond appropriately

Applied Knowledge

- AK0201 Identification, function, use and care of power tools and equipment (including ABR tools, lift and/or trestles, different types of hammers, dollies, body spoons, files, panel puller, appropriate grit abrasive)
- AK0202 Types of dents
- AK0203 Methods of repairing (surface cleaning, shaping, metal filing, body filling, sanding, stripping, grinding, assembling, feather edging, dusting finishing)
- AK0204 Methods of removing and replacing trim and accessories
- AK0205 Application of sealers (brushing, caulking gun, spraying)

- AK0206 Repair quality criteria
- AK0207 Practices related to quality, health, safety, and protection of the environment when using power tools and equipment

Internal Assessment Criteria

- IAC0201 The damaged is assessed using appropriate procedures
- IAC0202 Tools and equipment to repair minor dents are identified and used according to workshop requirements
- IAC0203 Minor dents are repaired using the appropriate method
- IAC0204 Repairs are performed and evaluated according to quality criteria
- IAC0205 Safety requirements when repairing minor dents are demonstrated
- IAC0206 Risks and hazards are identified and responded to in a responsible manner

2.2.3. PM-02-PS03: Remove dents without painting them (PDR)

Scope of Practical Skill

Given a range of power tools and equipment and assignments to repair dents without painting them (PDR) the learner must be able to:

- PA0301 Identify and select the different tools and panel beating equipment
- PA0302 Determine the repair procedure
- PA0303 Prepare the vehicle for small dent repair
- PA0304 Consult manufacturer's manuals
- PA0305 Repair small dents without painting them
- PA0306 Perform quality evaluation on repairs
- PA0307 Identify potential hazards and risks related to the use of the tools, equipment and develop appropriate response

Applied Knowledge

- AK0301 Identification, function, use and care of special tools and equipment to remove dents without painting them
- AK0302 Types of dents
- AK0303 Methods of preparing panels, sound deadners and undersealers
- AK0304 Methods of removing dents from different metals (base, ferrous, precious)
- AK0305 Repair quality criteria
- AK0306 Practices related to quality, health, safety, and protection of the environment when using tools and equipment to remove dents without painting them

Internal Assessment Criteria

- IAC0301 The damaged is assessed using appropriate procedures
- IAC0302 Tools and equipment to repair small dents without painting them are identified and used according to workshop requirements
- IAC0303 Small dents are repaired without painting them using the appropriate method
- IAC0304 Repairs evaluated according to quality criteria
- IAC0305 Safety requirements when repairing small dents without painting them are demonstrated
- IAC0306 Risks and hazards are identified and responded to in a responsible manner

2.2.4. PM-02-PS04: Remove, replace and align bolt on body panels

Scope of Practical Skill

Given a range of panel beating tools and equipment and assignments to remove, install and align bolt on body panels the learner must be able to:

- PA0401 Plan and prepare to remove, install and align bolt on body panels
- PA0402 Consult manufacturer's manuals
- PA0403 Remove, label and store body panel, trim and accessories using the appropriate procedures
- PA0404 Use problem-solving techniques to deal with problems encountered during removal
- PA0405 Install and align bolt on body panels according to workshop requirements
- PA0406 Identify and correct misalignment
- PA0407 Demonstrate adherence to safety precautions pertaining to removal, installation and alignment

Applied Knowledge

- AK0401 Identification, function, use and care of hand and power tools and panel beating equipment for removing, installing and aligning body panels
- AK0402 Specifications in vehicle manuals
- AK0403 Procedures for removing body panels
- AK0404 Methods for removing bolted components (doors, bonnets, boot lids, tailgates, fenders)
- AK0405 Methods for installing and aligning body panels
- AK0406 Methods for removing trim and accessories
- AK0407 Problem-solving techniques for removal, installation and alignment of body panels
- AK0408 Techniques to deal with misalignment
- AK0409 Practices related to quality, health, safety, and protection of the environment when using power tools and equipment to remove, replace and align bolt on body panels

Internal Assessment Criteria

- IAC0401 Tools and equipment to remove, install and align bolt on body panels are identified and used according to workshop requirements
- IAC0402 Bolt on body panels are removed, installed and aligned using appropriate methods and manufacturer specifications
- IAC0403 Trim and accessories are removed, installed and aligned according to workshop requirements
- IAC0404 Removal, installation and alignment of bolt on body panels are performed and evaluated according to quality criteria
- IAC0405 Problems are identified and corrected
- IAC0406 Safety requirements when removing, installing and aligning body panels are demonstrated
- IAC0407 Risks and hazards are identified and responded to in a responsible manner

2.2.5. PM-02-PS05: Remove, strip, repair, reassemble, replace and align door panels

Scope of Practical Skill

Given a range of panel beating tools and equipment and assignments to remove, strip, repair, reassemble, replace and align door panel the learner must be able to:

- PA0501 Plan and prepare to remove, strip, repair, reassemble, replace and align door panels
- PA0502 Consult manufacturer's manuals
- PA0503 Select the tools and equipment required for removing and stripping the door panel
- PA0504 Prepare the vehicle for removing and stripping door panel
- PA0505 Remove and strip the door using workshop procedures
- PA0506 Remove automotive door glass
- PA0507 Label and store door panel, trim and accessories using the appropriate procedures
- PA0508 Refit automotive door glass and align
- PA0509 Reassemble, install and align door panel according to workshop procedures
- PA0510 Demonstrate adherence to safe and environmentally responsible practices when removing, installing and aligning automotive window and door panel
- PA0511 Identify potential hazards and risks related to removing and refitting of automotive door and door glass and respond appropriately

Applied Knowledge

- AK0501 Structure of automotive door
- AK0502 Identification, function, use and care of tools and equipment for removing, installing and aligning automotive door and door glass

- AK0503 Procedures to remove and refit automotive door and door glass
- AK0504 Practices related to quality, health, safety, and protection of the environment when removing, stripping, repairing, reassembling, replacing and aligning door panels

Internal Assessment Criteria

- IAC0501 Tools and equipment to remove, strip, reassemble, install and align door panels and door glass are identified and used according to workshop requirements
- IAC0502 Door panels and door windows are removed, stripped, reassembled, installed and aligned using appropriate methods
- IAC0503 Trim and accessories are removed, installed and aligned according to workshop requirements
- IAC0504 Problems are identified and corrected
- IAC0505 Safety requirements when removing, stripping, reassembling, installing and aligning automotive door and door glass are applied
- IAC0506 Risks and hazards are identified and responded to in a responsible manner

2.2.6. PM-02-PS06: Repair deformed ferrous metal panels

Scope of Practical Skill

Given Given tools and equipment, materials, specifications and assignments to repair deformed ferrous metal body panels the learner must be able to:

- PA0601 Plan the repair process
- PA0602 Treat rust damage using appropriate corrosion protection methods
- PA0603 Repair the damaged area using the appropriate processes
- PA0604 Demonstrate correct use of tools and equipment to repair deformed ferrous metal panels
- PA0605 Use problem-solving techniques to deal with problems during repair work
- PA0606 Perform quality evaluation on repairs and make the necessary adjustments
- PA0607 Demonstrate adherence to safety precautions pertaining to removal, installation and alignment of panels

Applied Knowledge

- AK0601 Principles of repair process (curing, properties of filling material, dewaxing, corrosion protection)
- AK0602 Types of repair processes (planishing/filing, bumping, shrinking, complexed filler application, surface preparation, cutting and welding corroded panels, corrosion protection)
- AK0603 Materials for repair
- AK0604 Rust-proofing methods
- AK0605 Quality evaluation - deformities, curves, contours, lines, surface finish, deviations

- AK0606 Identification, function, use and care of hand and power tools and body repair equipment
- AK0607 Practices related to quality, health, safety, and protection of the environment when repairing deformed ferrous metal panels

Internal Assessment Criteria

- IAC0601 Tools and equipment to repair deformed ferrous metal panels are identified and used according to workshop requirements
- IAC0602 Corroded panels are cut and welded according to workshop procedure
- IAC0603 Types of body fillers are used appropriately
- IAC0604 Deformed ferrous metal panels are repaired according to workshop requirements
- IAC0605 Repairs are performed according to quality criteria and the necessary adjustments made
- IAC0606 Safety requirements when repairing deformed ferrous panels are demonstrated
- IAC0607 Risks and hazards are identified and responded to in a responsible manner

2.2.7. PM-02-PS07: Prepare body surface for painting

Scope of Practical Skill

Given tools and equipment and assignments to prepare body surface for painting the learner must be able to:

- PA0701 Identify the different substrates and their properties
- PA0702 Identify and use various tools, equipment and materials for surface preparation
- PA0703 Use wet and dry sanding systems to prepare the car panel/part
- PA0704 Apply body filler and micro fine stopper to the surface, as required
- PA0705 Mask and de-mask the car panel/part for paint work
- PA0706 Apply safety protection requirements during the surface preparation of body panel

Applied Knowledge

- AK0701 Different substrates and their properties (steel, aluminium, plastics, composite material)
- AK0702 Sanding systems
- AK0703 Identification, function, use and care of hand and power tools and surface preparation tools and equipment
- AK0704 Surface preparation terminology (feather-edging, hand sanding, block sanding, machine sanding)
- AK0705 Prepare repaired and new panels using sanding procedures
- AK0706 Masking materials and their application
- AK0707 Masking and demasking techniques

- AK0708 Practices related to quality, health, safety, and protection of the environment when preparing surfaces for painting

Internal Assessment Criteria

- IAC0701 Different substrates are identified and used correctly
- IAC0702 Wet and dry sanding systems are used appropriately
- IAC0703 Surfaces of repaired and new panels are prepared using the appropriate techniques
- IAC0704 Vehicles are masked and demasked according to workshop procedures
- IAC0705 Safety requirements when preparing surface are demonstrated
- IAC0706 Risks and hazards are identified and responded to in a responsible manner

2.2.8. PM-02-PS08: Repair non-ferrous metal body bolt on panels

Scope of Practical Skill

Given tools and equipment, materials and specifications and assignments to repair non-ferrous metal body bolt-on panels the learner must be able to:

- PA0801 Differentiate between types of non-ferrous metals
- PA0802 Consult manufacturer's manuals
- PA0803 Plan the repair process
- PA0804 Demonstrate correct use of tools and equipment to repair non-ferrous metal bolt-on panels
- PA0805 Repair the damaged area using the appropriate processes
- PA0806 Use problem-solving techniques to deal with problems encountered during repair work
- PA0807 Perform quality evaluation on repairs and make the necessary adjustments to maintain quality
- PA0808 Demonstrate adherence to safety precautions pertaining to removal, installation and alignment of non-ferrous metal body bolt on panels

Applied Knowledge

- AK0801 Non-ferrous metals (aluminium)
- AK0802 Different types of repair processes (surface preparation, planishing/filing, hot and cold shrinking, complexed filler application, replacing and aligning panels)
- AK0803 Identification, function, use and care of hand and power tools and panel beating equipment
- AK0804 Materials for repair
- AK0805 Quality evaluation - deformities, curves, contours, lines, surface finish, deviations, blemishes
- AK0806 Practices related to quality, health, safety, and protection of the environment when repairing non-ferrous metal body components

Internal Assessment Criteria

- IAC0801 Tools and equipment to repair non-ferrous metal body bolt on panels are identified and used according to workshop requirements
- IAC0802 Non-ferrous metal body bolt on panels are repaired according to workshop requirements
- IAC0803 Repairs are performed according to quality criteria and the necessary adjustments made
- IAC0804 Safety requirements when repairing non-ferrous metal body bolt on panels are demonstrated
- IAC0805 Risks and hazards are identified and responded to in a responsible manner

2.2.9. PM-02-PS09: Repair non-metal components

Scope of Practical Skill

Given a range of tools and equipment and assignments to repair non-metal components the learner must be able to:

- PA0901 Differentiate between non-metal components (fibre glass, carbon fibre, plastics)
- PA0902 Determine the repair process
- PA0903 Identify and select the different tools and repair equipment (including plastic welding equipment)
- PA0904 Consult manufacturer's manuals
- PA0905 Prepare the vehicle for repairing non-metal components
- PA0906 Perform repairs
- PA0907 In case of plastics, perform repairs using the appropriate welding, bonding, glueing techniques to repair plastic panels
- PA0908 Perform quality evaluation on repairs
- PA0909 Identify potential hazards and risks related to the use of the tools, equipment and respond appropriately

Applied Knowledge

- AK0901 Types of non-metal components (carbon fibre, fibre glass, plastics)
- AK0902 Properties, advantages and disadvantages associated with non-metal components
- AK0903 Different types of repair procedures [reinforced composite components, repair of superficial defects, plastic repair (hot-air, airless, ultrasonic, ultrasonic stud)]
- AK0904 Identification, function, use and care of tools for non-metal components
- AK0905 Materials for repair
- AK0906 Perform quality evaluation on repairs

- AK0907 Practices related to quality, health, safety, and protection of the environment when repairing non-metal components

Internal Assessment Criteria

- IAC0901 The uses of tools and equipment are correctly explained and demonstrated
- IAC0902 The damaged non-metal components are repaired using the appropriate techniques and materials
- IAC0903 Quality checks are performed and necessary adjustments are made
- IAC0904 Risks and hazards are identified and responded to in a responsible manner

2.3 Provider Programme Accreditation Criteria

Physical Requirements:

- Tools, panel beating equipment, welding, cutting and brazing equipment
- Car with body, door, non-ferrous metal body bolt on panels, panels with small dents and non-metal components
- Original Equipment Manufacturer manuals and specifications

Human Resource Requirements:

- Qualified Panel Beater with 5 years of experience in the trade for every 10 learners
- Recognised training in facilitation
- Recognised training in assessment

Legal Requirements:

- Compliance to the relevant occupational health, safety and environmental protection legislation.

2.4 Exemptions

- None

3. 684904000-PM-03, Perform advanced repairs to vehicle body and structure, NQF Level 4, Credits 60

3.1 Purpose of the Practical Skill Modules

The focus of the learning in this module is on providing the learner an opportunity to perform advanced automotive body repairs and structural alignment.

The learner will be required to:

- PM-03-PS01: Repair and align welded fenders and roof panels (ferrous)
- PM-03-PS02: Perform structural alignment on vehicle

3.2 Guidelines for Practical Skills

3.2.1. PM-03-PS01: Repair and align welded fenders and roof panels (ferrous)

Scope of Practical Skill

Given tools and equipment, and assignments to remove, install and align welded fenders and roof panels (ferrous) the learner must be able to:

- PA0101 Plan and prepare to remove, install and align welded fenders and roof panels
- PA0102 Consult manufacturer's manuals
- PA0103 Remove, trim and accessories and damaged panel using the appropriate procedures
- PA0104 Use problem-solving techniques to deal with problems encountered during removal
- PA0105 Prepare panel for welding
- PA0106 Weld the panel
- PA0107 Install and align welded body and roof panels according to workshop requirements
- PA0108 Identify and correct misalignment
- PA0109 Demonstrate adherence to safety precautions when removing, installing and aligning welded fenders and roof panels (ferrous)

Applied Knowledge

- AK0101 Identification, function, use and care of tools and equipment for removing, installing and aligning welded fenders and roof panels
- AK0102 Procedures for removing, installing and aligning welded fenders and roof panels
- AK0103 Methods for removing trim and accessories
- AK0104 Problem-solving techniques for removal, welding-on and alignment of welded fenders and roof panels
- AK0105 Techniques to deal with misalignment
- AK0106 Practices related to quality, health, safety and protection of the environment when removing, welding-on and aligning welded fenders and roof panels

Internal Assessment Criteria

- IAC0101 Tools and equipment to remove, install and align body welded fenders and roof panels are identified and used according to workshop requirements
- IAC0102 Welded fenders and roof panels are removed, installed, aligned and welded using appropriate methods
- IAC0103 Trim and accessories are removed, installed and aligned according to workshop requirements
- IAC0104 Removal, installation and alignment are performed and evaluated according to quality criteria
- IAC0105 Problems are identified and corrected
- IAC0106 Safety requirements when removing, installing, aligning welded fenders and roof panels are demonstrated
- IAC0107 Risks and hazards are identified and responded to in a responsible manner

3.2.2. PM-03-PS02: Perform structural alignment on vehicle

Scope of Practical Skill

Given straightening/alignment equipment, tools and assignments to straighten the vehicle the learner must be able to:

- PA0201 Identify chassis measuring and straightening equipment
- PA0202 Plan the straightening/alignment process
- PA0203 Align the upper body using the appropriate procedures
- PA0204 Re-align the body shell
- PA0205 Align the under body using the appropriate procedures
- PA0206 Re-align frame/chassis (diamond, twist, sag, mash and side ways damage)
- PA0207 Determine the pulling sequence
- PA0208 Use approved three dimensional measuring device to check alignment
- PA0209 Apply quality criteria to work performed
- PA0210 Demonstrate adherence to safety precautions when straightening/re-aligning vehicle

Applied Knowledge

- AK0201 Concepts and terminology related to body alignment (symmetry, pulling and straightening terminology, gauge, control points)
- AK0202 Measuring processes (including critical measuring points, 3-D measuring, mechanical measuring, electronic measuring)
- AK0203 Unibody/frame straightening/aligning equipment (chassis straightening bench, jig mounts)
- AK0204 Straightening and alignment techniques and processes

- AK0205 Pulling sequence with 3-D measuring device
- AK0206 Safety requirements

Internal Assessment Criteria

- IAC0201 Straightening and re-alignment equipment is set-up according to workshop procedures
- IAC0202 Measuring equipment is used according to workshop procedures
- IAC0203 Vehicle body is straightened/aligned using straightening and alignment techniques
- IAC0204 Pulling sequence is implemented using approved 3-D measuring device correctly
- IAC0205 Risks and hazards are identified and responded to in a responsible manner

3.3 Provider Programme Accreditation Criteria

Physical Requirements:

- Tools and equipment
- Cars with welded fenders and roof panels (ferrous), structural alignment problems
- Structural alignment equipment
- Original Equipment Manufacturer manuals and specifications

Human Resource Requirements:

- A learner-facilitator ratio of not more than 1:20
- Facilitators must be suitably qualified in the delivery of occupational training programs
- Facilitators must be qualified Panel Beaters with at least 5 years work experience as qualified panel beaters.

Legal Requirements:

- Compliance to the relevant occupational health, safety and environmental protection legislation.

3.4 Exemptions

- None

4. 684904000-PM-04, Remove and refit vehicle mechanical components and perform wheel alignment, NQF Level 4, Credits 30

4.1 Purpose of the Practical Skill Modules

The focus of the learning in this module is on providing the learner an opportunity to develop skills required to perform a range of vehicle mechanical repair activities and wheel alignment, using appropriate tools and equipment

The learner will be required to:

- PM-04-PS01: Remove and replace cooling system components
- PM-04-PS02: Remove and replace suspension system components
- PM-04-PS03: Remove and replace main automotive components
- PM-04-PS04: Remove and replace fuel tank
- PM-04-PS05: Remove and refit air conditioner components
- PM-04-PS06: Remove and refit exhaust system
- PM-04-PS07: Remove and refit wheels
- PM-04-PS08: Perform wheel alignment

4.2 Guidelines for Practical Skills

4.2.1. PM-04-PS01: Remove and replace cooling system components

Scope of Practical Skill

Given a range of assignments related to the cooling system, a range of tools and equipment the learner must be able to:

- PA0101 Identify things that can go wrong in the cooling system (overheating, overcooling, corrosion, coolant leak)
- PA0102 Pressure test the cooling system
- PA0103 Perform a visible inspection
- PA0104 Remove defective hoses and refit new hoses according to workshop procedures
- PA0105 Replace the coolant
- PA0106 Flush off the radiator and the engine block
- PA0107 Remove and replace a radiator
- PA0108 Remove and replace a cooling system thermostat
- PA0109 Remove and replace a water pump
- PA0110 Test a thermostatically-controlled fan
- PA0111 Select and use tools and equipment correctly
- PA0112 Demonstrate adherence to all safety requirements

Applied Knowledge

- AK0101 Radiator hose problems
- AK0102 Procedures to drain the radiator
- AK0103 Causes of overheating
- AK0104 Anti-freeze and coolant
- AK0105 Clamp types
- AK0106 Temperature sensors
- AK0107 Procedures for removing and replacing cooling system components
- AK0108 Procedures for pressure testing the cooling system
- AK0109 Safety and environmental requirements related to cooling systems

Internal Assessment Criteria

- IAC0101 A range of cooling system components are removed and refitted correctly
- IAC0102 Cooling system is pressure tested for leaks (static and operational)
- IAC0103 Safety requirements are applied when removing and refitting cooling system components

4.2.2. PM-04-PS02: Remove and replace suspension system components

Scope of Practical Skill

Given a range of assignments related to the suspension system, tools and equipment the learner must be able to:

- PA0201 Check suspension joints and pivots (wishbone joints, rubber bushes, rust, MacPherson strut, rear suspension, torsion bars, rear trailing arms, shock absorbers)
- PA0202 Remove and replace shock absorbers
- PA0203 Remove and replace complete MacPherson struts
- PA0204 Remove and replace coil springs
- PA0205 Replace anti-roll bar/stabiliser bar and bushes
- PA0206 Remove and replace steering rack and pinion and steering box
- PA0207 Replace steering rack boot
- PA0208 Replace track rod and tie-rod ends and ball joints
- PA0209 Remove and replace control arms/wishbone and sub-frame
- PA0210 Remove and fit wheel bearings
- PA0211 Demonstrate adherence to all safety requirements related to the removal and refitting of suspension system components

Applied Knowledge

- AK0201 Procedures to check a range of suspension components
- AK0202 Procedures to remove and replace a range of suspension components
- AK0203 Types of suspension systems
- AK0204 Safety requirements when working with suspension systems

Internal Assessment Criteria

- IAC0201 A range of suspension system components are checked using manufacturer's instructions and workshop procedures
- IAC0202 A range of suspension system components are removed and replaced correctly
- IAC0203 Safety requirements are adhered to when removing and refitting suspension system components

4.2.3. PM-04-PS03: Remove and replace main automotive components

Scope of Practical Skill

Given appropriate tools and equipment and assignments to remove and refit drive train components the learner must be able to:

- PA0301 Remove and refit an engine
- PA0302 Remove and refit transmission (manual and automatic)
- PA0303 Remove and refit differentials
- PA0304 Remove and refit front and rear axles
- PA0305 Component removal and installation procedures
- PA0306 Post-removal and installation procedures
- PA0307 Disposal of hazardous material (oils, coolant, fuels, cleaning agents)
- PA0308 Demonstrate adherence to all safety requirements related to drive train components

Applied Knowledge

- AK0301 Types of transmissions (manual and automatic)
- AK0302 Types of engines and their operations
- AK0303 Types of axles and their operations
- AK0304 Operations of differentials
- AK0305 Oil and transmission fluid
- AK0306 Procedures to remove and replace a range of main automotive components
- AK0307 Safety requirements when working with main automotive components

Internal Assessment Criteria

- IAC0301 Vehicles are prepared for removal and refit of main automotive components
- IAC0302 Main automotive components are removed and refitted according to manufacturer's specifications and workshop procedures
- IAC0303 Fitted components are tested to ensure correct functionality
- IAC0304 Oil and transmission fluid levels are checked and rectified
- IAC0305 Safety requirements are applied during removal and refit of main automotive components

4.2.4. PM-04-PS04: Remove and replace fuel tank

Scope of Practical Skill

Given a vehicle whose fuel tank requires replacing, tools and equipment the learner must be able to:

- PA0401 Prepare vehicle for fuel tank removal and replacement
- PA0402 Perform removal and replacement of fuel tank
- PA0403 Check fuel pipes, wires, clips, hose, connections
- PA0404 Check refitted fuel tank for leaks and check operation of fuel gauge
- PA0405 Demonstrate adherence to all safety requirements when removing and refitting a fuel tank

Applied Knowledge

- AK0401 Types and operations of fuel tank
- AK0402 Connections related to the fuel tank, that may require replacement
- AK0403 Procedures to remove and refit a fuel tank
- AK0404 Safety requirements when removing and replacing a fuel tank

Internal Assessment Criteria

- IAC0401 The fuel tank is removed and replaced according as per manufacturer's instructions and workshop procedure
- IAC0402 Tools and equipment are used correctly
- IAC0403 Safety requirements are applied when removing and refitting a fuel tank

4.2.5. PM-04-PS05: Remove and refit air conditioner components

Scope of Practical Skill

Given a vehicle with air conditioning system, tools and equipment the learner must be able to:

- PA0501 Prepare vehicle for removal and refitting of air conditioner components (compressor, receiver drier, pipes, condenser)

- PA0502 Perform removal and replacement of air conditioner components as per manufacturer's specifications
- PA0503 Evacuate and regas air conditioning system
- PA0504 Perform fault finding using pressure gauges
- PA0505 Demonstrate adherence to safety requirements when working with air-conditioning system

Applied Knowledge

- AK0501 Operations of air conditioning system
- AK0502 Components of an air conditioning system
- AK0503 Procedures to remove and replace air conditioner components
- AK0504 Fault finding procedures using pressure gauges
- AK0505 Safety requirements when working with air-conditioning system components

Internal Assessment Criteria

- IAC0501 Air conditioner components are removed and replaced according to workshop procedures
- IAC0502 Tools and equipment are used correctly
- IAC0503 Fault-finding procedures are performed using pressure gauges
- IAC0504 Safety requirements are adhered to when removing and refitting air conditioner components

4.2.6. PM-04-PS06: Remove and refit exhaust system

Scope of Practical Skill

Given a vehicle with an exhaust system, tools and equipment the learner must be able to:

- PA0601 Prepare vehicle for removal and refitting of exhaust system
- PA0602 Perform removal and replacement of exhaust system
- PA0603 Demonstrate adherence to safety requirements when working with exhaust systems

Applied Knowledge

- AK0601 Components of the exhaust system (pipes, silencers, catalytic converters, diesel particle filters, engine manifold, exhaust mountings, flanges, gaskets, rubber hangers, lambda sensors)
- AK0602 Procedures to remove and replace exhaust system
- AK0603 Vehicle lifting equipment
- AK0604 Safety requirements when working with exhaust systems

Internal Assessment Criteria

- IAC0601 Vehicle lifting equipment is correctly used

- IAC0602 Exhaust system is removed and replaced according to workshop procedures
- IAC0603 Tools and equipment are used correctly
- IAC0604 Safety requirements are adhered to when removing and refitting exhaust system components

4.2.7. PM-04-PS07: Remove and refit wheels

Scope of Practical Skill

Given a vehicle with wheels, tools and equipment the learner must be able to:

- PA0701 Prepare vehicle for removal and refitting of wheels
- PA0702 Perform removal and replacement of wheels
- PA0703 Demonstrate adherence to safety requirements when removing and refitting wheels

Applied Knowledge

- AK0701 Components of the wheel (rim, tyre, valve, lock nut)
- AK0702 Types of rims and tyres
- AK0703 Rim damage, tyre wear, tyre tread
- AK0704 Wheel alignment
- AK0705 Torque specifications
- AK0706 Procedures to remove and replace wheel
- AK0707 Vehicle lifting equipment
- AK0708 Safety requirements when removing and refitting wheels

Internal Assessment Criteria

- IAC0701 Vehicle lifting equipment is correctly used
- IAC0702 Vehicle wheels are removed and replaced according to workshop procedures
- IAC0703 Tools and equipment are used correctly
- IAC0704 Safety requirements are adhered to when removing and refitting exhaust system components

4.2.8. PM-04-PS08: Perform wheel alignment

Scope of Practical Skill

Given a vehicle whose alignment is incorrect, alignment equipment and tools the learner must be able to:

- PA0801 Prepare wheel alignment equipment as per manufacturer's specifications
- PA0802 Prepare vehicle for wheel alignment

- PA0803 Perform wheel alignment on the vehicle, using wheel alignment equipment
- PA0804 Interpret print-out
- PA0805 Demonstrate adherence to safety requirements when performing wheel alignment

Applied Knowledge

- AK0801 Steering geometry
- AK0802 Tyre construction
- AK0803 Wheel balancing
- AK0804 Terminology of wheel alignment (toe-in caster, camber, steering axis (kingpin) inclination, turning radius, static balance, dynamic balance, toe-in and toe-out wear)
- AK0805 Safety requirements when performing wheel alignment

Internal Assessment Criteria

- IAC0801 Wheel alignment machine is used as per manufacturer's instructions
- IAC0802 Wheel alignment is performed as per correct procedure
- IAC0803 Safety requirements are applied

4.3 Provider Programme Accreditation Criteria

Physical Requirements:

- Tools, equipment to perform a range of repairs and wheel alignment equipment
- Vehicle with wheels
- Original Equipment Manufacturer manuals and specifications

Human Resource Requirements:

- Qualified mechanic with 3 years' of experience in the trade for every 10 learners.
- Recognised training in facilitation
- Recognised training in assessment

Legal Requirements:

- Compliance to the relevant occupational health, safety and environmental protection legislation.

4.4 Exemptions

- None

5. 684904000-PM-05, Remove and replace auto-electrical components and perform diagnostics, NQF Level 3, Credits 26

5.1 Purpose of the Practical Skill Modules

The focus of the learning in this module is on providing the learner an opportunity to Develop skills required to remove and replace a range of auto-electrical repairs and activities using appropriate tools and equipment

The learner will be required to:

- PM-05-PS01: Remove and refit a sectional wiring harness
- PM-05-PS02: Remove and refit battery
- PM-05-PS03: Remove and refit vehicle lights
- PM-05-PS04: Remove and refit electric window mechanism and sunroof
- PM-05-PS05: Remove and replace supplementary restraint systems
- PM-05-PS06: Remove and refit sensors and cameras
- PM-05-PS07: Perform fault-finding using diagnostic equipment
- PM-05-PS08: Perform fault-finding using a multimeter

5.2 Guidelines for Practical Skills

5.2.1. PM-05-PS01: Remove and refit a sectional wiring harness

Scope of Practical Skill

Given a faulty sectional wiring harness, tools and equipment the learner must be able to:

- PA0101 Plan and prepare to remove sectional wiring harness
- PA0102 Consult manufacturer's manuals
- PA0103 Read and interpret basic auto-electrical circuit diagrams
- PA0104 Select appropriate hand tools and equipment
- PA0105 Remove and refit sectional wiring harness using the correct procedure
- PA0106 Adhere to safety requirements

Applied Knowledge

- AK0101 Types of harnesses
- AK0102 Types of harness problems
- AK0103 Procedures to remove and refit sectional wiring harnesses
- AK0104 Testing procedures
- AK0105 Safety requirements when working with harnesses

Internal Assessment Criteria

- IAC0101 Problems with a sectional wiring harness are identified

- IAC0102 Appropriate tools and equipment are selected to remove and refit a sectional wiring harness
- IAC0103 Correct procedures are followed to remove and fit sectional wiring harnesses
- IAC0104 Refitted harness is tested for functionality
- IAC0105 Safety requirements are applied when removing and refitting a sectional wiring harness

5.2.2. PM-05-PS02: Remove and refit battery

Scope of Practical Skill

Given a battery mounted on a vehicle, appropriate tools and equipment the learner must be able to:

- PA0201 Consult manufacturer
- PA0202 Prepare vehicle for battery removal
- PA0203 Remove, replace and secure battery
- PA0204 Check and adjust vehicle electronic systems
- PA0205 Handle removed battery appropriately
- PA0206 Charge a battery
- PA0207 Jump start a vehicle
- PA0208 Demonstrate adherence to all safety requirements

Applied Knowledge

- AK0201 Types and sizes of batteries
- AK0202 Battery removal and refitting procedures
- AK0203 Battery disposal procedures
- AK0204 Procedures for charging battery
- AK0205 Safety requirements for working on batteries

Internal Assessment Criteria

- IAC0201 The vehicle is prepared for battery removal according to vehicle manufacturer
- IAC0202 The battery is removed according to manufacturer
- IAC0203 The correct size of battery is selected, fitted and secured according to manufacturer
- IAC0204 Car electronics are checked for functionality post installation
- IAC0205 The removed battery is handled and disposed off according to battery manufacturer instructions
- IAC0206 Jump starting procedures are correctly and safely used and without causing damage to any of the vehicles involved in the procedure

- IAC0207 The battery is charged using battery manufacturer
- IAC0208 Safety requirements are applied when removing and refitting a battery

5.2.3. PM-05-PS03: Remove and refit vehicle lights

Scope of Practical Skill

Given a vehicle with operational lights and appropriate tools the learner must be able to:

- PA0301 Consult manufacturer
- PA0302 Prepare vehicle for removal of damaged light
- PA0303 Remove and replace damaged globe or light
- PA0304 Check functionality of fitted light and adjust if necessary
- PA0305 Adjust and focus headlights
- PA0306 Handle removed globe appropriately
- PA0307 Demonstrate adherence to all safety requirements

Applied Knowledge

- AK0301 Types of lights (indicator, reverse, headlight, tail light, high-voltage light, interior light, door panel light, xenon and LED)
- AK0302 Manufacturer
- AK0303 Light and globe removal and refitting procedures
- AK0304 Disposal procedures for removed light
- AK0304 Safety requirements when working with vehicle lights

Internal Assessment Criteria

- IAC0301 The vehicle is prepared for removal of light and globe
- IAC0302 The light and globe are removed and replaced according to manufacturer
- IAC0303 Headlight is adjusted and focussed according to manufacturer
- IAC0304 Appropriate tools and equipment are used correctly
- IAC0305 Fitted light and globe is checked for functionality
- IAC0306 The removed globe is handled and disposed off according to manufacturer instructions
- IAC0307 Safety requirements are applied when removing and refitting a light and globe

5.2.4. PM-05-PS04: Remove and refit electric window mechanism and sunroof

Scope of Practical Skill

Given a vehicle with electric windows, a sunroof, appropriate tools and equipment the learner must be able to:

- PA0401 Consult manufacturer
- PA0402 Prepare vehicle for removal of electric window mechanism and sunroof
- PA0403 Remove, replace and adjust electric window mechanism and sunroof
- PA0404 Conduct post-installation activities
- PA0405 Demonstrate adherence to all safety requirements

Applied Knowledge

- AK0401 Components of electric window mechanism and sunroof
- AK0402 Operation of electric window mechanism and sunroof
- AK0403 Electronic aspects of electrical window mechanism and sunroof
- AK0404 Removal and refitting procedures and adjustment techniques
- AK0405 Safety requirements when working on electric windows and sunroofs

Internal Assessment Criteria

- IAC0401 The vehicle is prepared for removal of electric window mechanism and sunroof according to vehicle manufacturer
- IAC0402 The electric window mechanism and sunroof are removed, refitted and adjusted according to manufacturer
- IAC0403 Appropriate tools and equipment are used for removal and refit of electrical window mechanism and sunroof
- IAC0404 The electronic functions of the electric window and the sunroof are tested
- IAC0405 The functionality of the fitted window mechanism and sunroof is checked
- IAC0406 Safety requirements are applied when removing and refitting electric window mechanism and sunroof

5.2.5. PM-05-PS05: Remove and replace supplementary restraint systems

Scope of Practical Skill

Given a vehicle with operational SR systems and appropriate tools the learner must be able to:

- PA0501 Consult manufacturer
- PA0502 Prepare vehicle for removal of SR system
- PA0503 Remove and replace a SR system component
- PA0504 Check functionality of the SRS component post-installation
- PA0505 Demonstrate adherence to all safety requirements

Applied Knowledge

- AK0501 Types of SR systems [airbags (driver, passenger, side, curtain, knee) seat belts, roll-over bar, head rest restraints, safety battery cable)
- AK0502 Removal and refitting procedures for SR systems
- AK0503 Location and operation of SR system components
- AK0504 Safety requirements when removing and refitting SR systems

Internal Assessment Criteria

- IAC0501 The vehicle is prepared for removal of SR system
- IAC0502 The SRS component is removed and replaced according to manufacturer
- IAC0503 The functionality of the replaced SR system component is checked
- IAC0504 Safety requirements are applied when removing and refitting SR system components

5.2.6. PM-05-PS06: Remove and refit sensors and cameras

Scope of Practical Skill

Given a vehicle with operational sensors, cameras and appropriate tools the learner must be able to:

- PA0601 Consult manufacturer
- PA0602 Prepare vehicle for removal of sensor or camera
- PA0603 Remove and replace a sensor or camera
- PA0604 Check functionality of the sensor or camera post-installation
- PA0605 Demonstrate adherence to all safety requirements

Applied Knowledge

- AK0601 Types of sensors (rain and light, park distance sensors)
- AK0602 Removal and refitting procedures for sensors or cameras
- AK0603 Location and operation of sensors or cameras
- AK0604 Sensitivity and calibration of cameras
- AK0605 Safety requirements when working with sensors and cameras

Internal Assessment Criteria

- IAC0601 The vehicle is prepared for removal of sensor or camera
- IAC0602 The sensor or camera is removed and replaced according to manufacturer
- IAC0603 The functionality of the replaced sensor or camera is checked
- IAC0604 Safety requirements are applied when removing and refitting sensor or camera

5.2.7. PM-05-PS07: Perform fault-finding using diagnostic equipment

Scope of Practical Skill

Given a range of auto-electrical faults and vehicle diagnostic tool the learner must be able to:

- PA0701 Use diagnostic tool to identify faults
- PA0702 Interpret diagnostic print-out
- PA0703 Demonstrate adherence to all safety requirements

Applied Knowledge

- AK0701 Vehicle diagnostics tool (software)
- AK0702 Methods of interpreting print-out
- AK0703 Safety requirements when working with diagnostic tool

Internal Assessment Criteria

- IAC0701 Vehicle diagnostics tool is used to identify faults
- IAC0702 Diagnostic print-out is interpreted using manufacturer instructions
- IAC0703 Safety requirements are adhered to during fault-finding process

5.2.8. PM-05-PS08: Perform fault-finding using a multimeter

Scope of Practical Skill

Given a range of basic types of auto-electrical faults and a multimeter the learner must be able to:

- PA0801 Identify basic types of auto-electrical faults (continuity, measure voltage and resistance)
- PA0802 Use a multi-meter to detect faults
- PA0803 Demonstrate adherence to all safety requirements

Applied Knowledge

- AK0801 Multi-meters
- AK0802 Types of basic auto-electrical faults
- AK0803 Safety requirements when using a multi-meter

Internal Assessment Criteria

- IAC0801 A multi-meter is used correctly to find auto-electrical fault
- IAC0802 Safety requirements are adhered to during fault-finding process

5.3 Provider Programme Accreditation Criteria

Physical Requirements:

- Tools, auto-electrical and diagnostic equipment to perform auto-electrical activities.
- Fully-operational cars
- Original Equipment Manufacturer manuals and specifications

Human Resource Requirements:

- Qualified auto electrician with 3 years' experience in the trade, for every 10 learners
- Recognised training in facilitation
- Recognised training in assessment qualified panel beaters.

Legal Requirements:

- Compliance to the relevant occupational health, safety and environmental protection legislation

5.4 Exemptions

- None

6. 684904000-PM-06, Analyse damage in terms of the job card and report to supervisor, NQF Level 4, Credits 40

6.1 Purpose of the Practical Skill Modules

The focus of the learning in this module is on providing the learner an opportunity to develop skills required to analyse damage on vehicle against job card

The learner will be required to:

- PM-06-PS01: Analyse damage to vehicle body against job card
- PM-06-PS02: Communicate with colleagues, supervisor and managers

6.2 Guidelines for Practical Skills

6.2.1. PM-06-PS01: Analyse damage to vehicle body against job card

Scope of Practical Skill

Given a range of assignments related to motor vehicle damage the learner must be able to:

- PA0101 Determine the extent of damage
- PA0102 Confirm damage against job card
- PA0103 Confirm rectification process for the damage
- PA0104 Determine the amount of time for completion of repair
- PA0105 Report discrepancies between job card and actual damage (verbal/written)

Applied Knowledge

- AK0101 Procedures to assess damage or loss
- AK0102 Rectification process for the damage or loss

Internal Assessment Criteria

- IAC0101 Damage is assessed using correct procedure and unseen damage is assessed if necessary
- IAC0102 Suggested rectification processes are checked
- IAC0103 Discrepancies are reported if necessary

6.2.2. PM-06-PS02: Communicate with colleagues, supervisor and managers

Scope of Practical Skill

Given communication assignments the learner must be able to:

- PA0201 Use appropriate telephone techniques and etiquette
- PA0202 Use technical language, verbal mannerisms and jargon appropriately
- PA0203 Observe organisational protocols during written and oral interaction

- PA0204 Vary tone, pitch, volume and pace during interaction
- PA0205 Apply appropriate listening skills
- PA0206 Demonstrate appropriate body language during interaction
- PA0207 Use written communication formats and techniques (emails, faxes, letters, internal memorandums) and language, syntax and content appropriate to them
- PA0208 Overcome barriers to communication using various techniques

Applied Knowledge

- AK0201 External and internal clients (customers, members, fellow colleagues)
- AK0202 Barriers to communication
- AK0203 Techniques for all modes of communication
- AK0204 Technical language, verbal mannerisms, jargon
- AK0205 Relevant protocols
- AK0206 Body language
- AK0207 Knowledge of people diversity (cultural, religious, linguistic, sexual orientation etc)
- AK0208 The communication process

Internal Assessment Criteria

- IAC0201 Telephone techniques and etiquette are appropriate to the task being performed
- IAC0202 Organisational or relevant protocols are applied during interaction with client
- IAC0203 Technical language is used appropriately and explained to client
- IAC0204 Verbal mannerisms and jargon are used appropriately in terms of the business interaction
- IAC0205 Variation in tone, pitch, volume and pace are used to enhance meaning and respond appropriately to client in different circumstances
- IAC0206 Effective listening skills are demonstrated to establish rapport with customer
- IAC0207 Written communication is clear, concise, accurate, spell checked and complies with rules of grammar and syntax
- IAC0208 Content and layout of written communication complies with company/organisational requirements
- IAC0209 Verbal and written communication are presented in a professional and ethical manner
- IAC0210 Communication techniques show that barriers to communication have been overcome

6.3 Provider Programme Accreditation Criteria

Physical Requirements:

- Damaged cars
- Original Equipment Manufacturer manuals and specifications

Human Resource Requirements:

- A facilitator with 3 years of experience in the trade for every 10 learners
- Recognised training in facilitation
- Recognised training in assessment

Legal Requirements:

- Compliance to the relevant occupational health, safety and environmental protection legislation

6.4 Exemptions

- None

SECTION 3C: WORK EXPERIENCE MODULE SPECIFICATIONS

List of Work Experience Module Specifications

- 684904000-WM-01, Removal and replacement processes for a range of automotive body components and trim in an auto-body workshop, NQF Level 3, Credits 16
- 684904000-WM-02, Basic repairs to vehicle body, NQF Level 3, Credits 44
- 684904000-WM-03, Major repairs to vehicle body, NQF Level 4, Credits 68
- 684904000-WM-04, Removal and replacement of mechanical components, NQF Level 3, Credits 28
- 684904000-WM-05, Removal and refitting of a auto-electrical components and performing basic fault-finding, NQF Level 3, Credits 12
- 684904000-WM-06, Analysis of damage against the job card, NQF Level 4, Credits 8
- 684904000-WM-07, Structured planning and communication processes in the workplace, NQF Level 4, Credits 4

1. 684904000-WM-01, Removal and replacement processes for a range of automotive body components and trim in an auto-body workshop, NQF Level 3, Credits 16

1.1 Purpose of the Work Experience Modules

The focus of the work experience is on providing the learner an opportunity to:

gain structured experience under guidance of a qualified panel beater and mentor in the workplace with regards to removing and replacing a range of automotive body components, exterior and interior trim and bonded glass to manufacturer's requirements within expected time frames.

The learner will be required to:

- WM-01-WE01: Observe and assist a qualified and experienced panel beater or automotive body repairer removing and refitting a dashboard, different types of exterior and interior trim and pieces bonded glass for a cumulative period of 40 hours
- WM-01-WE02: Remove and refit dashboard, exterior and interior trim and bonded glass under supervision of qualified and experienced panel beater or automotive body repairer for a cumulative period of 120 hours

1.2 Guidelines for Work Experiences

1.2.1. WM-01-WE01: Observe and assist a qualified and experienced panel beater or automotive body repairer removing and refitting a dashboard, different types of exterior and interior trim and pieces bonded glass for a cumulative period of 40 hours

Scope of Work Experience

The person will be expected to engage in the following work activities:

- WA0101 Observe dashboard, trim (exterior and interior) and bonded glass removal and refitting processes, safety procedures and vehicle preparation procedures
- WA0102 Observe interaction with workshop personnel and reporting
- WA0103 Assist in preparing vehicle for the removal and refit of dashboard, trim (exterior and interior) and bonded glass
- WA0104 Use tools and equipment for removing and refitting dashboard, exterior and interior trim and bonded glass
- WA0105 Assist in removing and refitting of dashboard, trim (exterior and interior) and bonded glass
- WA0106 Assist in inspecting the work performed to maintain quality
- WA0107 The experience must include observing and assisting in the removal and refitting of one dashboard, fifteen different types of the following internal trim (grommets, carpets, seats, roof lining, interior light, sun visors, rear view mirror, grab handles, A,B,C post trim covers, centre console, back board, safety belts, underfelt, sound proofing material, sunroof, sun visors, A,B and C post covers, headliner, instrument cluster) and five different types of the following external trim (bumpers (grill), towbars, roll bars, bull bars, side stepping, winches and park distance control sensors; reverse cameras, spoilers, mirrors, door handles, complex beadings, moulds, roof racks/bars, fender liners, under-carriage trim, mouldings, door sill beads, body badges) and five pieces of bonded glass.

Supporting Evidence

- SE0101 Workplace log book or portfolio

- SE0102 Sign-off by supervisor/mentor

1.2.2. WM-01-WE02: Remove and refit dashboard, exterior and interior trim and bonded glass under supervision of qualified and experienced panel beater or automotive body repairer for a cumulative period of 120 hours

Scope of Work Experience

The person will be expected to engage in the following work activities:

- WA0201 Prepare vehicle for removing and refitting dashboard, trim (exterior and interior) and bonded glass
- WA0202 Remove and refit dashboard, exterior and interior trim and bonded glass under supervision
- WA0203 Resolve problems that may arise during removal and refitting procedures
- WA0204 The experience must include removal and refitting of one dashboard and fifteen types of the following internal and external trim. Internal trim includes grommets, carpets, seats, roof lining, interior light, sun visors, rear view mirror, grab handles, A,B,C post trim covers, centre console, back board, safety belts, underfelt, sound proofing material, sunroof, sun visors, A,B and C post covers, headliner, instrument cluster. External trim includes bumpers (grill), towbars, roll bars, bull bars, side stepping, winches and park distance control sensors; reverse cameras, spoilers, mirrors, door handles, complex beadings, moulds, roof racks/bars, fender liners, under-carriage trim, mouldings, door sill beads, body badges. The learner must remove and refit five pieces of bonded glass.

Supporting Evidence

- SE0201 Workplace log book or portfolio
- SE0202 Sign-off by supervisor/mentor

1.3 Contextualised Workplace Knowledge

- 1 Handling and storage procedures for tools and equipment
- 2 Work records
- 3 Standard operating procedures
- 4 Original Equipment Manufacturer manuals and specifications
- 5 HIRA requirements

1.4 Criteria for Workplace Approval

Physical Requirements:

- Tools and equipment
- Standard operating procedures
- Original Equipment Manufacturer manuals and specifications
- Access to a fully functional and equipped auto-body workshop that allows experience in the full scope of work activities. Body shop must be approved or graded for structural repairs.

Human Resource Requirements:

- Qualified panel beater with 5 years of post-qualification experience in the trade for a maximum of 5 learners.
- Recognised experience in mentorship
- Recognised expertise in assessment

Legal Requirements:

- Compliance to the relevant occupational health, safety and environmental protection legislation.

1.5 Additional Assignments to be Assessed Externally

None

2. 684904000-WM-02, Basic repairs to vehicle body, NQF Level 3, Credits 44

2.1 Purpose of the Work Experience Modules

The focus of the work experience is on providing the learner an opportunity to:

gain structured experience under guidance of a qualified panel beater and mentor in the workplace with regards to performing a range of auto-body repair activities like: welding, cutting, drilling and brazing; rust repair; dent removal; removing, replacing and aligning bolt on body panels; removing, stripping, repairing, reassembling, replacing and aligning door panels; repairing deformed ferrous metal panels and preparing body surface for painting.

The learner will be required to:

- WM-02-WE01: Observe and assist a qualified and experienced panel beater welding, cutting, drilling and brazing during auto-body repair work for a for a cumulative period of 40 hours
- WM-02-WE02: Weld, cut, drill and braze under supervision of a a qualified and experienced for a cumulative period of 120 hours
- WM-02-WE03: Observe and assist a qualified and experienced panel beater perform a range of minor auto-body repair activities for a cumulative period of 80 hours
- WM-02-WE04: Perform a range of minor auto-body repairs under supervision of a qualified and experienced panel beater for a cumulative period of 280 hours

2.2 Guidelines for Work Experiences

2.2.1. WM-02-WE01: Observe and assist a qualified and experienced panel beater welding, cutting, drilling and brazing during auto-body repair work for a for a cumulative period of 40 hours

Scope of Work Experience

The person will be expected to engage in the following work activities:

- WA0101 Observe and assist a qualified and experienced panel beater with planning and preparing for welding, cutting, drilling and brazing activities during auto-body repairs
- WA0102 Observe and assist a qualified and experienced panel beater with safety and vehicle preparation procedures
- WA0103 Observe and assist a qualified and experienced panel beater with welding, cutting, drilling and brazing activities during auto-body repairs
- WA0104 Observe interaction with other personnel

Supporting Evidence

- SE0101 Workplace logbook or portfolio
- SE0102 Sign-off by qualified panel beater

2.2.2. WM-02-WE02: Weld, cut, drill and braze under supervision of a a qualified and experienced for a cumulative period of 120 hours

Scope of Work Experience

The person will be expected to engage in the following work activities:

- WA0201 Prepare for welding, cutting and brazing activities for auto-body repairs under supervision of a qualified and experienced panel beater
- WA0202 Perform safety and vehicle preparation procedures under supervision of a qualified and experienced panel beater
- WA0203 Weld, cut and braze during auto-body repairs under supervision of a qualified and experienced panel beater
- WA0204 Perform post welding, cutting and brazing activities

Supporting Evidence

- SE0201 Workplace logbook or portfolio
- SE0202 Sign-off by qualified panel beater

2.2.3. WM-02-WE03: Observe and assist a qualified and experienced panel beater perform a range of minor auto-body repair activities for a cumulative period of 80 hours

Scope of Work Experience

The person will be expected to engage in the following work activities:

- WA0301 Observe and assist a qualified and experienced panel beater obtain information from job requests and prepare to perform a range of auto-body repairs
- WA0302 Observe and assist a qualified and experienced panel beater conduct safety and vehicle preparation procedures
- WA0303 Observe and assist a qualified and experienced panel beater perform a range of auto-body repair processes
- WA0304 The experience must include all the following auto-body repair activities: repairing minor dents; removing, replacing and aligning bolt on body panels; removing, stripping, repairing, reassembling, replacing and aligning door panels; repairing deformed ferrous metal panels; repairing non-ferrous metal body bolt on panels; repairing non-metal components and preparing body surface for painting

Supporting Evidence

- SE0301 Workplace logbook or portfolio
- SE0302 Sign-off by qualified panel beater

2.2.4. WM-02-WE04: Perform a range of minor auto-body repairs under supervision of a qualified and experienced panel beater for a cumulative period of 280 hours

Scope of Work Experience

The person will be expected to engage in the following work activities:

- WA0401 Obtain information from job requests and prepare to repair auto-body of a vehicle under supervision of a qualified and experienced panel beater

- WA0402 Conduct safety and vehicle preparation procedures under supervision of a qualified and experienced panel beater
- WA0403 Perform a range of minor auto-body repair processes under supervision of a qualified and experienced panel beater
- WA0404 The experience must include all the following minor auto-body repair activities: repairing minor dents; removing, replacing and aligning bolt on body panels; removing, stripping, repairing, reassembling, replacing and aligning door panels; repairing deformed ferrous metal panels, repairing non-ferrous metal body bolt on panels; repairing non-metal components and preparing body surface for painting

Supporting Evidence

- SE0401 Workplace logbook or portfolio
- SE0402 Sign-off by qualified panel beater

2.3 Contextualised Workplace Knowledge

- 1 Workplace HIRA procedures
- 2 Material request and storage procedures
- 3 Tools and equipment handling and storage procedures
- 4 Standard operating procedures
- 5 Original Equipment Manufacturer manuals and specifications

2.4 Criteria for Workplace Approval

Physical Requirements:

- Tools and equipment
- Complete cars with or without engine and with bolt on body panels and door panels and ferrous metal panels
- Standard operating procedures
- Original Equipment Manufacturer manuals and specifications
- Access to a fully functional and equipped auto-body workshop that allows experience in the full scope of work activities. Body shop must be approved or graded for structural repairs.

Human Resource Requirements:

- Qualified panel beater with 5 years of post-qualification experience in the trade for a maximum of 5 learners
- Recognised experience in mentorship
- Recognised expertise in assessment

Legal Requirements:

- Compliance to the relevant occupational health, safety and environmental protection legislation

2.5 Additional Assignments to be Assessed Externally

None

3. 684904000-WM-03, Major repairs to vehicle body, NQF Level 4, Credits 68

3.1 Purpose of the Work Experience Modules

The focus of the work experience is on providing the learner an opportunity to:

gain structured experience under guidance of a qualified and experienced panel beater and mentor in the workplace with regards to performing a range of major auto-body repair activities like: repairing and aligning welded fenders and roof panels (ferrous); welding, cutting and brazing of the vehicle body; repairing bolt on non-ferrous body panels; repairing non-metal components and performing structural alignment on vehicle.

The learner will be required to:

- WM-03-WE01: Observe and assist a qualified and experienced panel beater perform a range of major auto-body repair activities for a cumulative period of 60 hours
- WM-03-WE02: Perform a range of major auto-body repairs under supervision of a qualified and experienced panel beater for a cumulative period of 540 hours

3.2 Guidelines for Work Experiences

3.2.1. WM-03-WE01: Observe and assist a qualified and experienced panel beater perform a range of major auto-body repair activities for a cumulative period of 60 hours

Scope of Work Experience

The person will be expected to engage in the following work activities:

- WA0101 Observe and assist a qualified and experienced panel beater obtain information from job requests and prepare to perform major repair auto-body
- WA0102 Observe and assist a qualified and experienced panel beater conduct safety and vehicle preparation procedures
- WA0103 Observe and assist qualified and experienced panel beater weld, cut, drill and braze during auto-body repair work (note inclusion of welding etc in major repair work)
- WA0104 Observe and assist a qualified and experienced panel beater perform a range of major auto-body repair activities
- WA0105 The experience must include all the following major auto-body repair activities: welding, cutting, drilling and brazing; repairing and aligning welded fenders and roof panels (ferrous) and performing structural alignment on vehicles

Supporting Evidence

- SE0101 Workplace logbook or portfolio
- SE0102 Sign-off by qualified panel beater

3.2.2. WM-03-WE02: Perform a range of major auto-body repairs under supervision of a qualified and experienced panel beater for a cumulative period of 540 hours

Scope of Work Experience

The person will be expected to engage in the following work activities:

- WA0201 Obtain information from job requests and prepare to repair auto-body under supervision of a qualified and experienced panel beater
- WA0202 Conduct safety and vehicle preparation procedures under supervision of a qualified and experienced panel beater
- WA0203 Weld, cut, drill and braze during auto-body repair work under supervision of a qualified and experienced panel beater (note inclusion of welding etc in major repair work)
- WA0204 Performing a range of major auto-body repair processes under supervision of a qualified and experienced panel beater
- WA0205 The experience must include all the following major auto-body repair activities: welding, cutting, drilling and brazing; repairing and aligning welded fenders and roof panels (ferrous); repairing bolt on non-ferrous body panels; repairing non-metal components and performing structural alignment on vehicle

Supporting Evidence

3.3 Contextualised Workplace Knowledge

- 1 Workplace HIRA procedures
- 2 Material request and storage procedures
- 3 Tools and equipment handling and storage procedures
- 4 Standard operating procedures
- 5 Original Equipment Manufacturer manuals and specifications

3.4 Criteria for Workplace Approval

Physical Requirements:

- Tools and equipment
- Complete cars with or without engine and with welded fenders and roof panels (ferrous), bolt on non-ferrous body panels;, non-metal components, and whose structural alignment needs to be repaired
- Standard operating procedures
- Original Equipment Manufacturer manuals and specifications
- Access to a fully functional and equipped auto-body workshop that allows experience in the full scope of work activities. Body shop must be approved or graded for structural repairs.

Human Resource Requirements:

- Qualified panel beater with 5 years of post-qualification experience in the trade for a maximum of 5 learners.
- Recognised experience in mentorship
- Recognised expertise in assessment

Legal Requirements:

- Compliance to the relevant occupational health, safety and environmental protection legislation

3.5 Additional Assignments to be Assessed Externally

None

4. 684904000-WM-04, Removal and replacement of mechanical components, NQF Level 3, Credits 28

4.1 Purpose of the Work Experience Modules

The focus of the work experience is on providing the learner an opportunity to:

gain structured experience under guidance of a qualified mechanic and mentor in the workplace to remove and replace/refit a range of mechanical components and systems like: cooling system components; suspension system components; main automotive components (engine, differentials, transmissions and axles); fuel tank; air conditioner components; exhaust system and wheels.

The learner will be required to:

- WM-04-WE01: Observe and assist a qualified and experienced automotive mechanic remove and replace/refit a variety of mechanical components and systems for a cumulative period of 40 hours
- WM-04-WE02: Remove and replace/refit a variety of mechanical components and systems under the supervision of a qualified and experienced automotive mechanic for a cumulative period of 240 hours

4.2 Guidelines for Work Experiences

4.2.1. WM-04-WE01: Observe and assist a qualified and experienced automotive mechanic remove and replace/refit a variety of mechanical components and systems for a cumulative period of 40 hours

Scope of Work Experience

The person will be expected to engage in the following work activities:

- WA0101 Observe and assist a qualified and experienced automotive mechanic in planning and preparing for removal and replacement of mechanical components and systems
- WA0102 Observe and assist with safety and vehicle preparation procedures
- WA0103 Observe interaction with mechanical repair personnel
- WA0104 Observe and assist a qualified and experienced automotive mechanic remove and refit a range of mechanical components and systems
- WA0105 The experience must include observing and assisting in removing and refitting all the following: cooling system components; suspension system components; main automotive components; fuel tank; air conditioner components; exhaust system and wheels

Supporting Evidence

- SE0101 Sign-off by qualified automotive mechanic
- SE0102 Workplace logbook or portfolio

4.2.2. WM-04-WE02: Remove and replace/refit a variety of mechanical components and systems under the supervision of a qualified and experienced automotive mechanic for a cumulative period of 240 hours

Scope of Work Experience

The person will be expected to engage in the following work activities:

- WA0201 Plan and prepare to remove and replace/refit a range of mechanical components and systems under supervision of a qualified and experienced automotive mechanic
- WA0202 Conduct safety and vehicle preparation procedures
- WA0203 Remove and refit a range of mechanical components and systems under supervision of a qualified and experienced automotive mechanic
- WA0204 The experience must include removing and refitting all the following: cooling system components; suspension system components; main automotive components; fuel tank; air conditioner components; exhaust system and wheels

Supporting Evidence

- SE0201 Sign-off by qualified automotive mechanic
- SE0202 Workplace logbook or portfolio

4.3 Contextualised Workplace Knowledge

1 Tool and equipment handling procedures

2 Work records

3 Safety procedures

4 Standard operating procedures

5 Original Equipment Manufacturer manuals and specifications

4.4 Criteria for Workplace Approval

Physical Requirements:

- Tools and equipment
- Car with all the mechanical components and systems mentioned in this module.
- Standard operating procedures
- Original Equipment Manufacturer manuals and specifications
- Access to a fully functional and equipped automotive mechanical workshop that allows experience in the full scope of activities. Body shop must be approved for structural repairs.

Human Resource Requirements:

- Qualified automotive mechanic with 3 years of post-qualification experience in the trade, for a maximum of 5 learners
- Recognised experience in mentorship
- Recognised expertise in assessment

Legal Requirements:

- Compliance to the relevant occupational health, safety and environmental protection legislation

4.5 Additional Assignments to be Assessed Externally

None

5. 684904000-WM-05, Removal and refitting of a auto-electrical components and performing basic fault-finding, NQF Level 3, Credits 12

5.1 Purpose of the Work Experience Modules

The focus of the work experience is on providing the learner an opportunity to:

gain structured experience under guidance of a qualified auto-electrician/mechanic in the workplace to remove and refit a sectional wiring harness, battery; vehicle lights; electrical window mechanism, sunroof; passive supplementary restraint systems and sensors and cameras and to perform fault-finding using a multi-meter and vehicle diagnostic machine.

The learner will be required to:

- WM-05-WE01: Observe and assist a qualified and experienced auto-electrician/mechanic remove and refit a range of auto-electrical components and perform fault-finding for a cumulative period of 40 hours
- WM-05-WE02: Under the supervision of a qualified and experienced auto-electrician/mechanic, remove and refit a range of auto-electrical components and perform fault-finding using a multimeter and a diagnostic tool compatible with OBD, for a cumulative period of 80 hours

5.2 Guidelines for Work Experiences

5.2.1. WM-05-WE01: Observe and assist a qualified and experienced auto-electrician/mechanic remove and refit a range of auto-electrical components and perform fault-finding for a cumulative period of 40 hours

Scope of Work Experience

The person will be expected to engage in the following work activities:

- WA0101 Observe and assist a qualified and experienced auto-electrician/mechanic plan and prepare for removal and refit of auto-electrical components and doing fault-finding using a multimeter and a diagnostic tool
- WA0102 Observe and assist with safety and vehicle preparation procedures
- WA0103 Observe interaction with auto-electrical repair personnel
- WA0104 Observe and assist a qualified and experienced auto-electrician/mechanic remove and refit a range of auto-electrical components and doing fault-finding using a multimeter and a diagnostic tool
- WA0105 The experience must include observing and assisting in removing and refitting the following: a sectional wiring harness; battery; vehicle lights; electrical window mechanism; sunroof; passive supplementary restraint systems; sensors and cameras. The learner must also perform fault-finding using a multi-meter in three different situations and use a diagnostic tool through an OBD on at least two occasions

Supporting Evidence

- SE0101 Sign-off by qualified automotive mechanic/auto-electrician
- SE0102 Workplace logbook or portfolio

5.2.2. WM-05-WE02: Under the supervision of a qualified and experienced auto-electrician/mechanic, remove and refit a range of auto-electrical components and perform fault-finding using a multimeter and a diagnostic tool compatible with OBD, for a cumulative period of 80 hours

Scope of Work Experience

The person will be expected to engage in the following work activities:

- WA0201 Plan and prepare to remove and refit auto-electrical components and do fault-finding using a multimeter and a diagnostic tool under supervision of a qualified and experienced auto-electrician/mechanic
- WA0202 Conduct safety and vehicle preparation procedures
- WA0203 Remove refit a range of auto-electrical components and do fault-finding using a multimeter and a diagnostic tool under supervision of a qualified and experienced auto-electrician/mechanic
- WA0204 The experience must include observing and assisting in removing and refitting the following: a sectional wiring harness; battery; vehicle lights; electrical window mechanism; sunroof; passive supplementary restraint systems; sensors and cameras. The learner must also perform fault-finding using a multi-meter in three different situations and use a diagnostic tool through an OBD on two occasions

Supporting Evidence

- SE0201 Sign-off by qualified automotive mechanic/auto-electrician
- SE0202 Workplace logbook or portfolio

5.3 Contextualised Workplace Knowledge

1 Tools and equipment

2 Work records

3 Standard operating procedures

4 Safety procedures

5.4 Criteria for Workplace Approval

Physical Requirements:

- Cars with electrical components listed in this module
- Tools and equipment (including the diagnostic tool)
- Standard operating procedures
- Original Equipment Manufacturer manuals and specifications
- Access to a functional auto-electrical workshop

Human Resource Requirements:

- Qualified auto-electrician/mechanic/panel beater with 3 years of post qualification experience in the trade for a maximum of 5 learners

- Recognised experience in mentorship
- Recognised expertise in assessment

Legal Requirements:

- Compliance to the relevant occupational health, safety and environmental protection legislation

5.5 Additional Assignments to be Assessed Externally

None

6. 684904000-WM-06, Analysis of damage against the job card, NQF Level 4, Credits 8

6.1 Purpose of the Work Experience Modules

The focus of the work experience is on providing the learner an opportunity to:

gain structured experience under guidance of an experienced panel beater in the workplace to analyse damage to vehicle against the job card and to report discrepancies to the supervisor, if necessary.

The learner will be required to:

- WM-06-WE01: Observe and assist a qualified and experienced panel beater analyse damage to three vehicles
- WM-06-WE02: Analyse damage to fifteen vehicles under the supervision of a qualified and experienced panel beater

6.2 Guidelines for Work Experiences

6.2.1. WM-06-WE01: Observe and assist a qualified and experienced panel beater analyse damage to three vehicles

Scope of Work Experience

The person will be expected to engage in the following work activities:

- WA0101 Observe and assist a qualified and experienced panel beater analyse damage systematically against job card
- WA0102 Observe and assist a qualified and experienced panel beater list and process discrepancies between the job card and the actual damage according to workplace procedures
- WA0103 Observe experienced panel beater report discrepancies to supervisor/management

Supporting Evidence

- SE0101 Damage analyses signed-off by supervisor

6.2.2. WM-06-WE02: Analyse damage to fifteen vehicles under the supervision of a qualified and experienced panel beater

Scope of Work Experience

The person will be expected to engage in the following work activities:

- WA0201 Analyse damage against job card systematically under supervision
- WA0202 Make observations about discrepancies between the job card and the actual damage and process discrepancies according to workplace procedures
- WA0203 Report discrepancies to supervisor/management, if necessary

Supporting Evidence

6.3 Contextualised Workplace Knowledge

1 Standard operating procedures

2 Damage analysis methodology

6.4 Criteria for Workplace Approval

Physical Requirements:

- Work station
- Standard operating procedures
- Damaged vehicle
- Access to a fully functional assessment/ estimation centre or workshop

Human Resource Requirements:

- Panel beater with 5 years of post-qualification experience in the trade for a maximum of 5 learners.
- Recognised experience in mentorship

Legal Requirements:

- Compliance to the relevant occupational health, safety and environmental protection legislation

6.5 Additional Assignments to be Assessed Externally

None

7. 684904000-WM-07, Structured planning and communication processes in the workplace, NQF Level 4, Credits 4

7.1 Purpose of the Work Experience Modules

The focus of the work experience is on providing the learner an opportunity to:

perform a number of tasks that will give them experience in a number of critical workplace areas outlined in this module.

The learner will be required to:

- WM-07-WE01: Work as a team member
- WM-07-WE02: Participate in and contribute to workplace meetings
- WM-07-WE03: Contribute to maintaining a safe and productive workshop environment
- WM-07-WE04: Contribute to minimising waste and controlling costs

7.2 Guidelines for Work Experiences

7.2.1. WM-07-WE01: Work as a team member

Scope of Work Experience

The person will be expected to engage in the following work activities:

- WA0101 Act as a team member for some projects in the workplace
- WA0102 Report on own progress and achievement within target dates and times for specific activities or tasks
- WA0103 Demonstrate the ability to respond constructively to problems experienced in the workplace and to provide guidance when required

Supporting Evidence

- SE0101 Job cards
- SE0102 Reports

7.2.2. WM-07-WE02: Participate in and contribute to workplace meetings

Scope of Work Experience

The person will be expected to engage in the following work activities:

- WA0201 Attend at least 4 meetings (planning, interdepartmental, quality control) and contribute to planning of and reporting on work activities

Supporting Evidence

- SE0201 Minutes of meetings

7.2.3. WM-07-WE03: Contribute to maintaining a safe and productive workshop environment

Scope of Work Experience

The person will be expected to engage in the following work activities:

- WA0301 Perform a hazard inspection and risk assessment of a car auto-body or vehicle repair workshop, report findings and make recommendations
- WA0302 Inspect the statutory registers for an auto-body or vehicle repair workshop, report findings and make recommendations

Supporting Evidence

- SE0301 Reports and recommendations

7.2.4. WM-07-WE04: Contribute to minimising waste and controlling costs

Scope of Work Experience

The person will be expected to engage in the following work activities:

- WA0401 Inspect the waste handling practices of an auto-body or vehicle repair workshop, report findings and make recommendations
- WA0402 Participate in the consumable store area for a minimum of one week and report on stock control practices and formulate recommendations

Supporting Evidence

- SE0401 Reports and recommendations

7.3 Contextualised Workplace Knowledge

1 Reporting channels and delegated responsibilities

2 Work records

3 Standard operating procedures

7.4 Criteria for Workplace Approval

Physical Requirements:

- Access to a fully functional auto-body or vehicle repair workshop

Human Resource Requirements:

- Qualified panel beater with 3 years of post-qualification experience in the trade for a maximum of 5 learners
- Recognised experience in mentorship
- Recognised experience in assessment

Legal Requirements:

- Compliance to the relevant occupational health, safety and environmental protection legislation

7.5 Additional Assignments to be Assessed Externally

None

SECTION 4: STATEMENT OF WORK EXPERIENCE

Curriculum Number:	684904000
Curriculum Title:	Panel Beater

Learner Details	
Name:	
ID Number:	

Employer Details	
Company Name:	
Address:	
Supervisor Name:	
Work Telephone:	
E-Mail:	

684904000-WM-01, Removal and replacement processes for a range of automotive body components and trim in an auto-body workshop, NQF Level 3, Credits 16

WM-01-WE01	Observe and assist a qualified and experienced panel beater or automotive body repairer removing and refitting a dashboard, different types of exterior and interior trim and pieces bonded glass for a cumulative period of 40 hours		
	Scope Work Experience	Date	Signature
WA0101	Observe dashboard, trim (exterior and interior) and bonded glass removal and refitting processes, safety procedures and vehicle preparation procedures		
WA0102	Observe interaction with workshop personnel and reporting		
WA0103	Assist in preparing vehicle for the removal and refit of dashboard, trim (exterior and interior) and bonded glass		
WA0104	Use tools and equipment for removing and refitting dashboard, exterior and interior trim and bonded glass		
WA0105	Assist in removing and refitting of dashboard, trim (exterior and interior) and bonded glass		
WA0106	Assist in inspecting the work performed to maintain quality		
WA0107	The experience must include observing and assisting in the removal and refitting of one dashboard, fifteen different types of the following internal trim (grommets, carpets, seats, roof lining, interior light, sun visors, rear view mirror, grab handles, A,B,C post trim covers, centre console, back board, safety belts, underfelt, sound proofing material, sunroof, sun visors, A,B and C post covers, headliner, instrument cluster) and five different types of the following external trim (bumpers (grill), towbars, roll bars, bull bars, side stepping, winches and park distance control sensors; reverse cameras, spoilers, mirrors, door handles, complex beadings, moulds, roof racks/bars, fender liners, under-carriage trim, mouldings, door sill beads, body badges) and five pieces of bonded glass.		
	Supporting Evidence	Date	Signature

SE0101	Workplace log book or portfolio		
SE0102	Sign-off by supervisor/mentor		
WM-01-WE02	Remove and refit dashboard, exterior and interior trim and bonded glass under supervision of qualified and experienced panel beater or automotive body repairer for a cumulative period of 120 hours		
	Scope Work Experience	Date	Signature
WA0201	Prepare vehicle for removing and refitting dashboard, trim (exterior and interior) and bonded glass		
WA0202	Remove and refit dashboard, exterior and interior trim and bonded glass under supervision		
WA0203	Resolve problems that may arise during removal and refitting procedures		
WA0204	The experience must include removal and refitting of one dashboard and fifteen types of the following internal and external trim. Internal trim includes grommets, carpets, seats, roof lining, interior light, sun visors, rear view mirror, grab handles, A,B,C post trim covers, centre console, back board, safety belts, underfelt, sound proofing material, sunroof, sun visors, A,B and C post covers, headliner, instrument cluster. External trim includes bumpers (grill), towbars, roll bars, bull bars, side stepping, winches and park distance control sensors; reverse cameras, spoilers, mirrors, door handles, complex beadings, moulds, roof racks/bars, fender liners, under-carriage trim, mouldings, door sill beads, body badges. The learner must remove and refit five pieces of bonded glass.		
	Supporting Evidence	Date	Signature
SE0201	Workplace log book or portfolio		
SE0202	Sign-off by supervisor/mentor		

	Contextualised Workplace Knowledge	Date	Signature
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1	Handling and storage procedures for tools and equipment		
2	Work records		
3	Standard operating procedures		
4	Original Equipment Manufacturer manuals and specifications		
5	HIRA requirements		

	Additional Assignments to be Assessed Externally	Date	Signature
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684904000-WM-02, Basic repairs to vehicle body, NQF Level 3, Credits 44

WM-02-WE01	Observe and assist a qualified and experienced panel beater welding, cutting, drilling and brazing during auto-body repair work for a for a cumulative period of 40 hours		
	Scope Work Experience	Date	Signature
WA0101	Observe and assist a qualified and experienced panel beater with planning and preparing for welding, cutting, drilling and brazing activities during auto-body repairs		
WA0102	Observe and assist a qualified and experienced panel beater with safety and vehicle preparation procedures		
WA0103	Observe and assist a qualified and experienced panel beater with welding, cutting, drilling and brazing activities during auto-body repairs		
WA0104	Observe interaction with other personnel		

	Supporting Evidence	Date	Signature
SE0101	Workplace logbook or portfolio		
SE0102	Sign-off by qualified panel beater		
WM-02-WE02	Weld, cut, drill and braze under supervision of a a qualified and experienced for a cumulative period of 120 hours		
	Scope Work Experience	Date	Signature
WA0201	Prepare for welding, cutting and brazing activities for auto-body repairs under supervision of a qualified and experienced panel beater		
WA0202	Perform safety and vehicle preparation procedures under supervision of a qualified and experienced panel beater		
WA0203	Weld, cut and braze during auto-body repairs under supervision of a qualified and experienced panel beater		
WA0204	Perform post welding, cutting and brazing activities		
	Supporting Evidence	Date	Signature
SE0201	Workplace logbook or portfolio		
SE0202	Sign-off by qualified panel beater		
WM-02-WE03	Observe and assist a qualified and experienced panel beater perform a range of minor auto-body repair activities for a cumulative period of 80 hours		
	Scope Work Experience	Date	Signature
WA0301	Observe and assist a qualified and experienced panel beater obtain information from job requests and prepare to perform a range of auto-body repairs		
WA0302	Observe and assist a qualified and experienced panel beater conduct safety and vehicle preparation procedures		

WA0303	Observe and assist a qualified and experienced panel beater perform a range of auto-body repair processes		
WA0304	The experience must include all the following auto-body repair activities: repairing minor dents; removing, replacing and aligning bolt on body panels; removing, stripping, repairing, reassembling, replacing and aligning door panels; repairing deformed ferrous metal panels; repairing non-ferrous metal body bolt on panels; repairing non-metal components and preparing body surface for painting		
	Supporting Evidence	Date	Signature
SE0301	Workplace logbook or portfolio		
SE0302	Sign-off by qualified panel beater		
WM-02-WE04	Perform a range of minor auto-body repairs under supervision of a qualified and experienced panel beater for a cumulative period of 280 hours		
	Scope Work Experience	Date	Signature
WA0401	Obtain information from job requests and prepare to repair auto-body of a vehicle under supervision of a qualified and experienced panel beater		
WA0402	Conduct safety and vehicle preparation procedures under supervision of a qualified and experienced panel beater		
WA0403	Perform a range of minor auto-body repair processes under supervision of a qualified and experienced panel beater		
WA0404	The experience must include all the following minor auto-body repair activities: repairing minor dents; removing, replacing and aligning bolt on body panels; removing, stripping, repairing, reassembling, replacing and aligning door panels; repairing deformed ferrous metal panels, repairing non-ferrous metal body bolt on panels; repairing non-metal components and preparing body surface for painting		
	Supporting Evidence	Date	Signature

SE0401	Workplace logbook or portfolio		
SE0402	Sign-off by qualified panel beater		

	Contextualised Workplace Knowledge	Date	Signature
1	Workplace HIRA procedures		
2	Material request and storage procedures		
3	Tools and equipment handling and storage procedures		
4	Standard operating procedures		
5	Original Equipment Manufacturer manuals and specifications		

	Additional Assignments to be Assessed Externally	Date	Signature

684904000-WM-03, Major repairs to vehicle body, NQF Level 4, Credits 68

WM-03-WE01	Observe and assist a qualified and experienced panel beater perform a range of major auto-body repair activities for a cumulative period of 60 hours		
	Scope Work Experience	Date	Signature
WA0101	Observe and assist a qualified and experienced panel beater obtain information from job requests and prepare to perform major repair auto-body		
WA0102	Observe and assist a qualified and experienced		

	panel beater conduct safety and vehicle preparation procedures		
WA0103	Observe and assist qualified and experienced panel beater weld, cut, drill and braze during auto-body repair work (note inclusion of welding etc in major repair work)		
WA0104	Observe and assist a qualified and experienced panel beater perform a range of major auto-body repair activities		
WA0105	The experience must include all the following major auto-body repair activities: welding, cutting, drilling and brazing; repairing and aligning welded fenders and roof panels (ferrous) and performing structural alignment on vehicles		
	Supporting Evidence	Date	Signature
SE0101	Workplace logbook or portfolio		
SE0102	Sign-off by qualified panel beater		
WM-03-WE02	Perform a range of major auto-body repairs under supervision of a qualified and experienced panel beater for a cumulative period of 540 hours		
	Scope Work Experience	Date	Signature
WA0201	Obtain information from job requests and prepare to repair auto-body under supervision of a qualified and experienced panel beater		
WA0202	Conduct safety and vehicle preparation procedures under supervision of a qualified and experienced panel beater		
WA0203	Weld, cut, drill and braze during auto-body repair work under supervision of a qualified and experienced panel beater (note inclusion of welding etc in major repair work)		
WA0204	Performing a range of major auto-body repair processes under supervision of a qualified and experienced panel beater		
WA0205	The experience must include all the following major		

	auto-body repair activities: welding, cutting, drilling and brazing; repairing and aligning welded fenders and roof panels (ferrous); repairing bolt on non-ferrous body panels; repairing non-metal components and performing structural alignment on vehicle		
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	Contextualised Workplace Knowledge	Date	Signature
1	Workplace HIRA procedures		
2	Material request and storage procedures		
3	Tools and equipment handling and storage procedures		
4	Standard operating procedures		
5	Original Equipment Manufacturer manuals and specifications		

	Additional Assignments to be Assessed Externally	Date	Signature
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684904000-WM-04, Removal and replacement of mechanical components, NQF Level 3, Credits 28

WM-04-WE01	Observe and assist a qualified and experienced automotive mechanic remove and replace/refit a variety of mechanical components and systems for a cumulative period of 40 hours		
	Scope Work Experience	Date	Signature
WA0101	Observe and assist a qualified and experienced automotive mechanic in planning and preparing for		

	removal and replacement of mechanical components and systems		
WA0102	Observe and assist with safety and vehicle preparation procedures		
WA0103	Observe interaction with mechanical repair personnel		
WA0104	Observe and assist a qualified and experienced automotive mechanic remove and refit a range of mechanical components and systems		
WA0105	The experience must include observing and assisting in removing and refitting all the following: cooling system components; suspension system components; main automotive components; fuel tank; air conditioner components; exhaust system and wheels		
	Supporting Evidence	Date	Signature
SE0101	Sign-off by qualified automotive mechanic		
SE0102	Workplace logbook or portfolio		
WM-04-WE02	Remove and replace/refit a variety of mechanical components and systems under the supervision of a qualified and experienced automotive mechanic for a cumulative period of 240 hours		
	Scope Work Experience	Date	Signature
WA0201	Plan and prepare to remove and replace/refit a range of mechanical components and systems under supervision of a qualified and experienced automotive mechanic		
WA0202	Conduct safety and vehicle preparation procedures		
WA0203	Remove and refit a range of mechanical components and systems under supervision of a qualified and experienced automotive mechanic		
WA0204	The experience must include removing and refitting all the following: cooling system components; suspension system components; main automotive components; fuel tank; air conditioner components;		

	exhaust system and wheels		
	Supporting Evidence	Date	Signature
SE0201	Sign-off by qualified automotive mechanic		
SE0202	Workplace logbook or portfolio		

	Contextualised Workplace Knowledge	Date	Signature
1	Tool and equipment handling procedures		
2	Work records		
3	Safety procedures		
4	Standard operating procedures		
5	Original Equipment Manufacturer manuals and specifications		

	Additional Assignments to be Assessed Externally	Date	Signature
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684904000-WM-05, Removal and refitting of a auto-electrical components and performing basic fault-finding, NQF Level 3, Credits 12

WM-05-WE01	Observe and assist a qualified and experienced auto-electrician/mechanic remove and refit a range of auto-electrical components and perform fault-finding for a cumulative period of 40 hours		
	Scope Work Experience	Date	Signature

WA0101	Observe and assist a qualified and experienced auto-electrician/mechanic plan and prepare for removal and refit of auto-electrical components and doing fault-finding using a multimeter and a diagnostic tool		
WA0102	Observe and assist with safety and vehicle preparation procedures		
WA0103	Observe interaction with auto-electrical repair personnel		
WA0104	Observe and assist a qualified and experienced auto-electrician/mechanic remove and refit a range of auto-electrical components and doing fault-finding using a multimeter and a diagnostic tool		
WA0105	The experience must include observing and assisting in removing and refitting the following: a sectional wiring harness; battery; vehicle lights; electrical window mechanism; sunroof; passive supplementary restraint systems; sensors and cameras. The learner must also perform fault-finding using a multi-meter in three different situations and use a diagnostic tool through an OBD on at least two occasions		
	Supporting Evidence	Date	Signature
SE0101	Sign-off by qualified automotive mechanic/auto-electrician		
SE0102	Workplace logbook or portfolio		
WM-05-WE02	Under the supervision of a qualified and experienced auto-electrician/mechanic, remove and refit a range of auto-electrical components and perform fault-finding using a multimeter and a diagnostic tool compatible with OBD, for a cumulative period of 80 hours		
	Scope Work Experience	Date	Signature
WA0201	Plan and prepare to remove and refit auto-electrical components and do fault-finding using a multimeter and a diagnostic tool under supervision of a qualified and experienced auto-electrician/mechanic		
WA0202	Conduct safety and vehicle preparation procedures		
WA0203	Remove refit a range of auto-electrical components and do fault-finding using a multimeter and a diagnostic		

	tool under supervision of a qualified and experienced auto-electrician/mechanic		
WA0204	The experience must include observing and assisting in removing and refitting the following: a sectional wiring harness; battery; vehicle lights; electrical window mechanism; sunroof; passive supplementary restraint systems; sensors and cameras. The learner must also perform fault-finding using a multi-meter in three different situations and use a diagnostic tool through an OBD on two occasions		
	Supporting Evidence	Date	Signature
SE0201	Sign-off by qualified automotive mechanic/auto-electrician		
SE0202	Workplace logbook or portfolio		

	Contextualised Workplace Knowledge	Date	Signature
1	Tools and equipment		
2	Work records		
3	Standard operating procedures		
4	Safety procedures		

	Additional Assignments to be Assessed Externally	Date	Signature
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684904000-WM-06, Analysis of damage against the job card, NQF Level 4, Credits 8

WM-06-WE01	Observe and assist a qualified and experienced panel beater analyse damage to three vehicles		
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	Scope Work Experience	Date	Signature
WA0101	Observe and assist a qualified and experienced panel beater analyse damage systematically against job card		
WA0102	Observe and assist a qualified and experienced panel beater list and process discrepancies between the job card and the actual damage according to workplace procedures		
WA0103	Observe experienced panel beater report discrepancies to supervisor/management		
	Supporting Evidence	Date	Signature
SE0101	Damage analyses signed-off by supervisor		
WM-06-WE02	Analyse damage to fifteen vehicles under the supervision of a qualified and experienced panel beater		
	Scope Work Experience	Date	Signature
WA0201	Analyse damage against job card systematically under supervision		
WA0202	Make observations about discrepancies between the job card and the actual damage and process discrepancies according to workplace procedures		
WA0203	Report discrepancies to supervisor/management, if necessary		

	Contextualised Workplace Knowledge	Date	Signature
1	Standard operating procedures		
2	Damage analysis methodology		

	Additional Assignments to be Assessed Externally	Date	Signature
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684904000-WM-07, Structured planning and communication processes in the workplace, NQF Level 4, Credits 4

WM-07-WE01	Work as a team member		
	Scope Work Experience	Date	Signature
WA0101	Act as a team member for some projects in the workplace		
WA0102	Report on own progress and achievement within target dates and times for specific activities or tasks		
WA0103	Demonstrate the ability to respond constructively to problems experienced in the workplace and to provide guidance when required		
	Supporting Evidence	Date	Signature
SE0101	Job cards		
SE0102	Reports		
WM-07-WE02	Participate in and contribute to workplace meetings		
	Scope Work Experience	Date	Signature
WA0201	Attend at least 4 meetings (planning, interdepartmental, quality control) and contribute to planning of and reporting on work activities		
	Supporting Evidence	Date	Signature
SE0201	Minutes of meetings		
WM-07-WE03	Contribute to maintaining a safe and productive workshop environment		
	Scope Work Experience	Date	Signature

WA0301	Perform a hazard inspection and risk assessment of a car auto-body or vehicle repair workshop, report findings and make recommendations		
WA0302	Inspect the statutory registers for an auto-body or vehicle repair workshop, report findings and make recommendations		
	Supporting Evidence	Date	Signature
SE0301	Reports and recommendations		
WM-07-WE04	Contribute to minimising waste and controlling costs		
	Scope Work Experience	Date	Signature
WA0401	Inspect the waste handling practices of an auto-body or vehicle repair workshop, report findings and make recommendations		
WA0402	Participate in the consumable store area for a minimum of one week and report on stock control practices and formulate recommendations		
	Supporting Evidence	Date	Signature
SE0401	Reports and recommendations		

	Contextualised Workplace Knowledge	Date	Signature
1	Reporting channels and delegated responsibilities		
2	Work records		
3	Standard operating procedures		

	Additional Assignments to	Date	Signature
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	be Assessed Externally		
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